

Elegy for the Eastern Cougar: Forgotten Souls of Appalachia

by

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## ABSTRACT

*The people who think they've seen a cougar resist the obvious and logical explanations. They want to believe they've seen the rarest and arguably the most dangerous animal possible where they live. Surely these cougars are cultural projections, drawn perhaps from guilt for one collective ravaging of the continent, and from yearning for the exoneration that the survival of cougars would confer. Psychologists say that knowledge of mankind's assault on the natural world is a painful source of modern Angst.*

*Surely, too, there is an element of thrill-seeking in the sightings, in a culture addicted to the fastest, biggest, highest, and fiercest, whether in machines, mountains, or animals. Maybe the image of cat goes deeper than culture. Maybe it has been permanently etched on human consciousness by eons of fear and admiration. Cat sightings may be a primal expression of the human understanding of nature.*

-Chris Bolgiano, "Mountain Lion: An Unnatural History of Pumas and People," 1995<sup>1</sup>

The eastern cougar once ranged from eastern Canada to Georgia, thriving in the mountains and forests of Appalachia and its surroundings.<sup>2</sup> Before Europeans arrived, cougars roamed freely.

Soon after the European colonization of the United States, settlers came to see the eastern cougar as a threat. For centuries, cougars were killed mercilessly and recklessly. State governments placed bounties on the cougars, paying citizens for the cats' scalps.

By 1850, eastern cougars were considered rare. By 1900, they were almost entirely extirpated south of the Mississippi. However, although the last known eastern cougar was killed in Maine in 1938, the cougar was not formally declared extinct until 2018.<sup>3</sup> For those 80 years, legends and misperceptions kept the animal alive.

Even today, the Fish and Wildlife Service receives hundreds of reported eastern cougar sightings each year. Ninety percent are other animals; the remainder are escaped captives or cougars migrating from the west.<sup>4</sup>

This piece, combining narrative, poetic voice, and scientific and anthropological data, will examine the life and death of the eastern cougar, the parts humans have played in its actual extinction and the denial of its extinction, and human impact on biodiversity and extinction today.

## INTRODUCTION AND METHODOLOGIES

In the last century, vertebrates have gone extinct at a rate 114 times its average.<sup>5</sup> More than 332 land vertebrates have gone extinct since 1500, leaving vertebrates 25 percent less abundant than they were before. Sixteen to 33 percent are endangered or threatened today. While extinctions occur naturally on their own, the exponential increase in extinctions has been primarily caused by human activity, whether through deforestation, overhunting, or other human effects on climate change. Human behavior is sparking a biodiversity crisis, and if not addressed, the earth could enter its sixth extinction in the next 200 to 3,000 years.<sup>6</sup>

Media discussion of climate change and biodiversity have both greatly increased since 1991, according to a 2018 study of United States, Canada, and United Kingdom newspapers.<sup>7</sup> In 2000, however, a discrepancy between the amount of coverage of climate change and biodiversity change began, and the discrepancy has increased steadily each year since 2003. Overall, media coverage of climate change was three times more prevalent than that of biodiversity, reaching as much as eight times higher in 2016. There is a shortage of discussion about biodiversity in our media coverage. Although climate change is an ever-present threat to Earth's current biome, biodiversity is just as broad an issue and is deeply intertwined and interconnected with climate change. The biodiversity crisis is degrading ecosystems and leading to the extinction of unique and valuable animals. The conversation needs to change.

In Appalachia, we have some of the most lively and successful biodiversity in the world. Salamanders, fungi, and other wet forest dwellers have especially unmatched biodiversity in these mountains.<sup>8</sup> I have chosen, however, to focus on the story of the eastern cougar.

The eastern cougar, once prevalent throughout Appalachia, was likely largely extirpated from Appalachia by 1900 due to overhunting.<sup>9</sup> The last known eastern cougar was killed in

Maine in 1938, but the Fish and Wildlife Service did not declare the eastern cougar extinct formally until February 2018. In those 80 years, miscommunication and misperception allowed scientists and the public alike to cling to uncertainty rather than understand the nature of the animal's extinction.

I found the story of the eastern cougar largely by accident. I have spent the semester working as an editorial assistant for Appalachian Voices, a nonprofit environmental advocacy group primarily charged with ending issues such as mountaintop removal mining, and oil and gas fracking in Appalachia. I write for their bimonthly newspaper, *The Appalachian Voice*. Though I expected to spend more time reporting and interviewing in the field during this internship, I've primarily spent my time summarizing press releases and digging through the internet to find others' data and research. In early February, I was assigned to write 300 words on the eastern cougar, a species I didn't know existed. I assumed mountain lions existed in these mountains and forests just because the Appalachians seemed like places cougars would live; little did I know, humans had slaughtered the animals to extinction almost a century earlier. The Fish and Wildlife Service declared on January 22, 2018 that the eastern cougar would be formally declared extinct February 22.<sup>10</sup> I was to provide a brief description and history of the animal, how it went extinct, and why it took decades to declare it so.

Even after I wrote the story, however, the eastern cougar stuck with me. It seemed the animal was a powerful symbol of the biodiversity crisis in Appalachia. The cougar was once one of the few apex predators of the Appalachians. It reigned over 21 states and kept the ecosystem in balance ("Questions and Answers: Delisting the eastern cougar..." FWS).<sup>11</sup> When Europeans arrived, they killed every last one of the eastern cougars. Misinformation and legends about the animals, however, allowed humans to believe for almost a century that they had not caused the

cougars' extinction, that they had not shattered the Appalachians' forest ecosystem by ridding the region of its only apex predators. Humans killed the animal without considering it, and it took a hundred years to realize what they had done.

Today, many other animals endemic to Appalachia are endangered. While we intentionally killed every cougar in the forests, extinctions today are mostly due to causes like habitat loss or effects of climate change. Although our stories today are often not as haunting as that of the eastern cougar, species that once thrived in Appalachia are now suffering. Rising temperatures and drought are killing fish and salamanders endemic to Appalachia, and habitat loss is pushing many land species out of their homes and into urban areas.<sup>12</sup> Most people may not recognize the extent to which human activity and urbanization are negatively affecting animal populations. Species may go extinct without humans even realizing it, and as with the story of the eastern cougar, I worry it won't be until decades too late that we realize what we've done.

I chose to highlight the story of the eastern cougar to shed a great deal of light on one particular story of human-caused extinction in Appalachia. By pushing readers to look at humans' history with extinction and how long the eastern cougar's extinction story has gone untold, my hope has been to encourage readers to think critically about human relationships with animals going forward. Perhaps a closer look at the story of an animal whose extinction we ignored can help us to recognize animals that are threatened with extinction today. I believe that awareness is the first key step to addressing the biodiversity crisis we face in these mountains and worldwide today, and I hope the haunting, but not unique, story of the eastern cougar can offer readers that moment of awakening.

Going into this project, my goal was to explore both the scientific, historical, and emotional sides of the eastern cougar's story. There is an astounding amount to explore with the

eastern cougar: for starters, it is difficult to write about an animal, particularly its extinction, without delving into the science. The eastern cougar has a complex and well-debated taxonomic class; to this day, it is unknown whether the eastern cougar was a subspecies of its own or merely an extensive, independent population of the North American cougar subspecies. Further, the history and lore of the eastern cougar runs far deeper than I could ever go, given the time constraints of this project. The eastern cougar has over a dozen recorded names, including mountain lion, puma, and painter to name a few, and probably countless others unbeknownst to me, a sign of the animal's proliferation through human culture and conversation. The story of its extinction is long and harrowing, and intersects complexly with the human history of America's foundation. There was much to explore, and there is much I have yet to explore.

I also wanted, however, to write about this topic with emotion and empathy. There is no shortage of scientific research and journals on biodiversity issues. My goal was to recast this data in a new light. Scientific studies can present unsettling data on extinction, but they often cannot give a face or a heart to the issue. Such writing cannot evoke empathy. Empathy is a great catalyst for social and environmental change. Art -- in my case poetry, storytelling, and narrative -- has historically been utilized to shed light on social issues and bring about advocacy and change through appealing to readers' most human emotions. It allows us to relate with others in a way faceless statistics cannot by inserting us into the experiences of people and animals unlike us.

In 1969, artists took to the San Francisco Bay and painted the word "oil" on the water's surface in eco-friendly dye off the dock of an oil refinery to bring attention to water pollution.<sup>13</sup> In 2007, artist Eve Mosher painted a chalk line across New York City, dividing the parts of the city that would end up underwater via rising sea levels, a threat imposed by climate change. In

2013, undergraduate cellist David Crawford transliterated global climate data from 1880 to 2012 into music, assigning each year a pitch representing the surface temperature of that year, to compose “A Song for Our Warming Planet.” In December 2017, a video of a starving polar bear boomed on social media, leaving a pit in viewers’ stomachs.<sup>14</sup> Art transcends data and research; allowing people to see, hear, read, and feel the emotional realities of environmental issues incites awareness in a way nothing else can.

I am exploring the story of the eastern cougar through a combination of narrative, poetry, and journalism known to some as “verse journalism” or “journalism in verse.” Pulitzer Prize winning poet Gwendolyn Brooks coined the term in 1972 in the first volume of her autobiography, *Report from Part One*. She defined verse journalism as “poet as fly on the wall... poet as all-seeing eye” (“Verse Journalism: The Poet as Witness,” Lansana and Popoff).<sup>15</sup> Poetry allows a more investigative, emotion-evoking angle of journalism; it allows the writer to look at the issue from the inside out. While the writer is responsible for researching and providing readers with accurate, appropriately-sourced information, as in journalism, verse journalism allows for the freedom of poetry, the inclusion of emotion, opinion, narrative, and creative imaginings. Verse journalism allows the writer to evoke emotion and empathy in a deeper way.

Verse journalism has been employed to incite advocacy for a number of social and environmental issues alike. Gwendolyn Brooks used verse journalism to document her experiences as a black woman in Chicago throughout her poetry. Cheyenne Nimes, another poet writing about extinction, used a form of verse journalism to tackle environmental issues such as climate change and pollution.<sup>16</sup> Her work features a combination of data and excerpts from scientific articles as well as emotional, stream-of-consciousness explorations of humans’ state of being to overwhelm the reader with both information and emotion. In “A Refuge for Jae-In Doe:

Fugues in the Key of English Major,” poet Seo-Yung Chu recounts her experiences with sexual assault, expanding beyond her own narrative to include statistics and anecdotes that explore rape culture on college campuses as a whole.<sup>17</sup> In each of these examples, writers combine the research-based principles of journalism and the emotive literary techniques of poetry to advocate for social and environmental change. They inform and educate their readers, but are not afraid to evoke deep, human emotions in the process. While journalists use anecdotes, interviews, and in some cases narrative to inspire feeling in their readers, verse journalism allows writers to take this a step further. Verse journalism allows the writer to seep the piece in her own feelings and sensations, enabling her to connect personally with the reader and the subject.

In my project, I used scientific research, data on eastern cougars, and information from the Fish and Wildlife Service to provide a foundation of academic research to my piece. I also supplemented these sources with a number of journal entries and book passages dating back over 100 years to analyze historical perceptions of eastern cougars and the history of the animals’ extinction. Finally, I collected interviews and stories from ecologists and nature lovers today to examine human relationships with the environment and animals as they exist today. I sought to weave these together using narrative and poetic storytelling, particularly by introducing each section of my work with a story chronicling one imagined cougar’s experience with humans, but also by using poetic and explorative language to evoke an emotional response from my readers.

My goal in this piece is to educate others about a long-lost animal of Appalachia, one that once thrived in the Appalachian Mountains and helped maintain our fragile, yet resilient ecosystem, but also one that died at humans’ hands. I want to memorialize this animal, as well as the many other animals lost to extinction in Appalachia, but I also hope to inspire critical thinking and emotive response in readers. I hope to help readers realize that extinction, furthered



by human activity, is a crisis suffered by Appalachia and the world at large. My goal is that readers come one step closer to realizing the urgency of the biodiversity crisis in our region and planet and the impact humans have on our world.



The eastern cougar.

Latin name: *Puma concolour cougar*.

Common name(s): eastern cougar, catamount,

mountain lion, puma,

panther, painter,

*ghost cat*.

At one time, this solitary hunter of many names prevailed in every eastern state and every terrain, inhabiting dense forests and rugged mountain ranges stretching from eastern Canada to South Carolina.

Today, they are gone.



## **PART I. THE REIGN OF THE EASTERN COUGAR**

The cougar pressed heavy paws against lush, green moss and crouched low, letting herself become hidden in the dark shroud of nightfall.

Her body was long for a female's, about seven feet from her nose to the tip of her tail, and she used her lean frame to her advantage.<sup>18</sup>

She was hunting, searching for the scent of a warm heartbeat. The day had just succumbed to dusk, and like the cougar, white-tailed deer were most active in the hours just before and after the sun's presence.

Recently, the mother's hunting grounds closely skirted the edges of the forest. It was more dangerous there; humans lurked in the yellow field beyond the treeline. But the scent of corn drew in herds of young, naive deer.

Deer were becoming harder to find, and the cougar had young to feed.

It was June. The cougar's two kittens were eight months old now, finally weaned and learning to hunt. Their fur was gray and mottled, and their eyes were still icy blue, just starting to turn golden like their mother's. By the age of two, they would look like their mother, sleek and long with tawny, brown fur and flaxen eyes.<sup>19</sup>

The mother cougar sought white-tailed deer for the kittens, hiding the young away in her den before guiding them to her kill. Some nights they came along for the hunt, but tonight she was going too close to the forest's edge. She would have to be very careful, scope out the land, before she would take them here.

For now, she was alone.



The cougar was once the most widely distributed animal in the Western Hemisphere.<sup>20</sup> They have since been extirpated from two-thirds of their original territory.

The eastern cougar was likely a population of the North American cougar subspecies, one of six geographically isolated populations falling within the general species of cougar. Original scientific speculation, as well as some today, considers the eastern cougar to be a subspecies of its own, conjecturing that, in fact, 32 subspecies fall within the cougar family.<sup>21</sup>

The eastern cougar ranged from Ontario to South Carolina, dwelling in marshes, mountains, and forests alike.

They were long, muscular cats, six to nine feet, and their bodies adapted to almost any challenge. They could swim, climb trees, and leap horizontally and vertically at great distances.

*He climbs Trees with the greatest Agility imaginable, is very strong limbed, catching a piece of Meat from any Creature he strikes at. His Tail is exceeding long; his Eyes look very fierce and lively, are large and of a grayish Colour...*

--John Lawson, "History of North Carolina," 1709<sup>22</sup>

They had tawny, short fur, reddish-brown or brownish-gray, but were born with a camouflage of black spots, a ringed tail, and blue eyes. Their eyes turned brown by six months, and their coats lost their spots by two years.<sup>23</sup>

White-tailed deer were their primary food source, one every seven to 10 days, but they also feasted on other small mammals. As agriculture spread, cougars occasionally killed livestock.

The cats, typical for cougars, were largely solitary; the only times they were together were to mate or to rear young, a task taken on solely by the females. Mothers reared cubs for an average of two years; cougars usually lived for an average of eight.<sup>24</sup>

After learning to hunt, young cougars traveled to find their own territories. Females typically traveled five to 20 miles, while males needed larger territories and often traveled more than 25 miles to find regions with mates. Some traveled hundreds of miles, or even thousands.

The cougar earned its name in 1693, when taxonomist John Ray called the cat "cuguacuarana," a native Brazilian name. By the 1760s, Europeans called them "couguars," and they were known as "cougars" in the eastern U.S. by the early 1800s.<sup>25</sup>

Their many other names came from a variety of regions, cultures and misconceptions, mostly owing to the similarities in their appearance to lions and panthers in other countries.

As Europeans settled on the East Coast and expanded their colonization of the land, predators like the eastern cougar were eventually seen as a threat to agriculture and urbanization. Government bounties on the animals sought tens and thousands of cougars' lives.

The population was ultimately extirpated east of the Mississippi by 1900, save the few hundred Florida panthers living in the far south.<sup>26</sup>

Throughout the next century, alleged sightings persisted. Even in the 21st century, wildlife organizations receive hundreds of reports each year of cougars haunting eastern forests.

The Fish and Wildlife Service estimates 90 percent of reported sightings are simply mistaken. The other 10 percent are cougars who have migrated from Florida or the west, or escaped captivity. The eastern cougar, it asserts, is dead.

Stereotyped in life as elusive and powerful, cowardly and bloodthirsty, the eastern cougar lived enshrouded in mystery and legend. In death, this sense of mystery has kept the eastern cougar alive 100 years longer.

Humans have denied the extinction of the cougar, perhaps to explain the wildness of Appalachia's forests and the uncanny sensation of predators lurking, or perhaps to deny the fact that an animal could go extinct solely by human hands.

## **PART II. THE COUGAR'S LORE**

The cougar caught the scent and froze. A doe, camouflaged by dusk, fell within her line of sight.

Her young would stay by her side for another year or less, learning to hunt. Then they would leave to find their own territories. The female would likely stay closer, finding a range bordering her mother's. The male would have to travel farther, perhaps hundreds of miles, to find a larger territory and mates.<sup>27</sup>

The cougar was strong and silent. On a good day, she could leap 15 feet in the air and 20 feet forward in a single stride.

Her canine teeth were sensitive and precise, almost preternaturally, almost surgically, and she knew just how to slide them between deers' vertebrae, breaking their necks without snapping a single bone.

With her cubs growing, the mother would need to hunt frequently. Things would slow down when they left. Then she would seek another mate.

She slipped forward like a fog, stalking the doe, as energy collected with anticipation in her hind legs and jaw.

She lunged.



Legends across cultures and generations have painted the cougar as both a friend and a foe, a creature with a divine connection to the spiritual and a conniving predator.

In the Western world, the cougar represents agility and ferocity. Its many names are donned by sports teams and its image is printed on athletic gear.

Once their silhouettes don't make a profit, however, they become threats to urbanization. When they encroach upon humanity, they are killed.



Cultures throughout history, spanning countries and continents, have associated the cougar with power, mystery and spirituality in myths good and bad.

In ancient Greece, the god of fertility, Dionysus, mounted a panther as his steed.<sup>28</sup> In a story told by the Shoshone-Bannock tribes of Idaho, the leader of the spirits was a benevolent cougar bearing the hands and head of a man.<sup>29</sup>

In the Incan Empire, pumas represented the strength of the earth. The walls of Cusco, the empire's religious capital, were designed to take the shape of a puma. It was a sacred city, home to the civilization's elite.<sup>30</sup>

In a 1955 interview, a member of northwest Canada's Nootka tribe said mountain lions were the one animal their people could not understand.<sup>31</sup> Charles Eastman, a Lakota from Minnesota, once called mountain lions "unsociable, queer people. Their speech has no charm. They are very bashful and yet dangerous, for no animal can tell what they are up to. If one sees you first, he will not give you a chance to see so much as the tip of his tail. He never makes any noise, for he has the right sort of moccasins."

The Cherokee nation tells a story of the underground panthers.<sup>32</sup> In the story, a man was approached by a panther while hunting in the forest. He gripped his bow, tensing to defend himself, but when the panther spoke, it was as though they were the same, as though they were brothers.

The panther taught the man how to hunt, and together they traveled to the panther's home. They danced and ate among the panther's brethren.

After hours of hunting, eating and dancing, night fell, and the man returned to his people. They had been looking for him, they said. He had been gone many days.

The man died within seven days of his return. He had already taken on the panther nature, and could no longer live with man. Had he stayed with the panthers, the man would have lived.

In the early 1500s, Europeans flooded into the region, bringing agricultural development and preconceived notions of predators with them. Some early European settlers, however, saw cougars as cowardly and debated whether they were threats to humans at all.

*The Indian kill'd a very fat Doe, and came across a Bear, which had been put to Death and was half devour'd by a Panther. The last of these Brutes reigns absolute Monarch of the Woods, and in the keenness of his hunger will venture to attack a Bear; tho' then 'tis ever by surprize, as all Beasts of the cat kind use to come upon their Prey.*

*As formidable as this Beast is to his Fellow Brutes, he never has the confidence to venture upon a Man, but retires from him with great respect, if there be a way open for his Escape. However, it must be confesst, his Voice is a little contemptible for a Monarch of the Forrest, being not a great deal louder nor more awful than the Mewing of a Household Cat.*

-William Byrd II, "History of the Dividing Line," 1728<sup>33</sup>

By the mid-1800s, Americans were moving westward, and many of the real-life motifs and stories told about cougars were fully saturated in cougars' lore. Though Americans still often referenced their cowardice, eastern cougars were also labeled as dangerous menaces.

*A murderous PANTHER plied the work of Death!  
Adown the sufferer's brindled sides ran blood,  
Profusely streaming. Cruelly, with teeth  
Of spear-accuminated sharpness, gnaw'd  
The merc'less monster through the strength-strung loins...*

-Excerpt from *Mountain Muse*, published in Virginia 1813 by Daniel Bryan<sup>34</sup>

Stories of cougars stalking humans, attacking sleeping humans (or burying them in leaves, as in caching, a practice in which cougars bury dead prey in leaves for a later point), and attacking horses while humans were riding them were especially prevalent.

*When the benighted traveller, or the wearied hunter may be slumbering in his rudely and hastily constructed bivouac at the foot of a huge tree, amid the lonely forest, his fire nearly out, and all around most dismal, dreary, and obscure, he may perchance be roused to a state of terror by the stealthy tread of the prowling Cougar; or his frightened horse, by its snortings and struggles to get loose, will awaken him in time to see the glistening eyes of the dangerous beast glaring upon him like two burning coals... For, be sure the animal has not approached him without the gnawing hunger -- the desire for blood; engendered by long fasting and gaunt famine.*

-John James Audubon, *Viviparous Quadrupeds of North America*, 1846<sup>35</sup>

As American settlement expanded, cougars could not stay. They were predators: powerful, secretive. Dangerous.

Armed with fear and misconceptions, the settlers wrote myths of their own about cougars. They wielded guns, traps, and words like “dangerous” to extirpate and destroy the eastern cougar.

Today, American myth enshrouds the cougar with some of the same mystery, awe, and complexity of stories past.

The last known eastern cougar was killed in Maine in 1938.<sup>36</sup> To this day, hundreds of people living in Appalachia have reported seeing the elusive cougar migrating through their forests and mountains.

The National Fish and Wildlife Service reports it receives hundreds of sightings each year. None of them, it has decided, change the reality of the cougar’s extinction.

Among internet blogospheres and hushed conversations between hunters and hikers, rumors of the eastern cougar still survive.

Organizations are also dedicated to tracking cougar sightings. The Eastern Puma Research Network, founded by cryptozoologist John Lutz in 1983, has gathered over 7,500 reported sightings of eastern cougars.<sup>37</sup>

One quarter, it claims, have been verified.

The Cougar Network, founded in 2002, has compiled over 700 confirmations of cougars beyond their western range.<sup>38</sup> Even the Fish and Wildlife Service acknowledges the existence of cougars in the east.

In 1997, a cougar kitten was struck by a car in Kentucky.<sup>39</sup> The kitten was presumed to be of captive origin, its blood rich with South American DNA. In 2011, a solitary male traveled 2,000 miles from South Dakota through Minnesota, Wisconsin, and New York, only to be killed on a Connecticut highway. In 2014, a cougar of unknown origin was killed in Kentucky.

The FWS asserts that cougars in the east like these are from other populations and subspecies, roaming accidentally through the eastern cougar’s mountains.



*Follow-up investigations have indicated that more than 90 percent are typically misidentified species of wildlife, such as bobcats, fishers, bears, deer, house cats and dogs. However, sometimes these reports are valid reports of pumas.*

*These cats are not eastern cougars, but are individuals originated from populations outside the historical range of the eastern cougar: either Florida panthers, animals dispersing from the West, or animals that have been released or escaped from captivity.*

-Fish and Wildlife Service, “Long Extinct Eastern Cougar to be Removed from Endangered Species List Correcting Lingering Anomaly,” Jan. 22, 2018<sup>40</sup>

In the public hunt for eastern cougars, photos and sightings are easily misinterpreted, and tracks are often mistaken by civilians for dogs’. Though photos and tracks can confirm cougar sightings, DNA, scat, and carcasses are more easily accepted by federal organizations, and they are difficult to find.<sup>41</sup>

Annual sightings increased with the popularity of the Internet. Scary stories, hoaxes, and edited images added to pop culture’s excitement about the cougars.

Most civilian sightings are just that, sightings: large animals running through trees and crossing roads late at night. Some argue that these sightings may be fueled by adrenaline, awe, or a need to understand and relate with the earth.

*I don't think it's all some conspiracy that people want to see them, but I do think there is a cultural element to it, that the idea of cougars being here takes people back to the way things were, despite the mystique and fear associated with them. This is how Appalachia was. This was part of the wild, untamed mountains before they became ski resorts and college towns and all these things. There is still a wild kind of heartbeat underneath the developmental changes occurring in Appalachia the last couple hundred years.*

-Mark Spond, adjunct instructor of geography and National Park Service liaison to Appalachian State University<sup>42</sup>



Hundreds of ghosts each year haunt eastern forests. Spirits possessing house cats, reminding them of what they could be, spectors pulling other panthers toward the mountains, reminding them of what they are.

People see what they want to see, the Forest Service reports. People see ghosts while hunting, while hiking, while rocking on their back porches at night, unable to sleep. People see an iteration of the eastern cougar whose flames we did not extinguish some hundred years ago, an iteration that promises wildness outlining suburban borders.

Extinction. The word derives from the Latin *stinguere*, to quench, as a flame. To smother a flame, to consume a flame, to shoot, trap, poison a cougar,  
to extinguish.<sup>43</sup>

### **PART III. THE EXTINCTION OF THE EASTERN COUGAR**

The cougar loomed over her kill, her bloodied mouth parted over the doe's throat. She fastened her jaw around the deer's long, slender neck, dragging its body backward into a deep bush of nettles.

She buried the carcass in a thin layer of pine needles, leaves, and scattered earth. She and her cubs would come back to the cache each night, starting tonight with the organs and then the flesh.

The brambles knitting themselves through the cougar's fur seemed to swallow the deer's body. Though bears and foxes could easily find and scavenge the carcass while she was gone, she memorized the sight, smell, and feel of that area and moment -- sweet, earthy forest, the dry scent of corn fields, and grass further north -- and left to return to her cubs.

For the first week of their lives, the kittens couldn't open their eyes. They were small and defenseless, so prone to death. Her third cub of the litter, the smallest, died within a few weeks of its birth, too weak to truly begin living.

As her kittens began to wean from their mother's milk, she brought pieces of her kills back to the den, letting the kittens stay safe, hidden in their nook in the rock.

While they were still invisible to the world, still products of their mother's instinct, the kittens were introduced to the taste of blood. The mother carried flesh from her mouth to her children's.



The word "extinction" appeared in English at around the year 1500, approximately the same time Europeans came to America and taught the land what the word meant.<sup>44</sup> They sounded out the syllables on the rivers' mouths and spelled it in the blood of the humans and other animals who got in their way.

According to the International Union for the Conservation of Animals, the continental United States has the most extinct species of any country, at 155.<sup>45</sup>

Worldwide, approximately 900 species have gone extinct since 1500. Fourteen of those extinctions have occurred since the turn of the 21st century.<sup>46</sup>



For hundreds of years, in the Old World and the very new, Europeans killed cougars in droves. For some time, a bounty was placed on the animals. States exchanged money with civilians for cougar scalps.<sup>47</sup>

Cougars were seen as a nuisance and a danger to human expansion. Cougars killed livestock and, very rarely, injured and killed humans. When they attacked humans and their livestock, cougars unknowingly waged war.

In the early 1500s, Jesuits traded Native Americans dead cougars for bulls in California. Over the next few centuries, state bounties trickled in.

First was Connecticut, 1684. Massachusetts, 1742. Pennsylvania, 1807. Oregon, 1843. Utah, 1888 (they classified cougars as “an obnoxious animal”). Washington, 1905. California, 1907. British Columbia, 1910. Idaho, 1914. Colorado, 1929. Arizona, 1947.<sup>48</sup>

An estimated 65,000 cougars were taken during government predator control programs.

Some hunters were more skilled and determined than others in their search for the cats. In the Adirondacks of New York, one man, George Muir, was especially recognized for his ability to track and kill cougars. Between May 1879 and February 1887, Muir claimed 67 cougar bounties. All other New York residents claimed a total of seven.<sup>49</sup>

Extinction ensued. By 1850, eastern cougars were considered rare. By 1900, cougars were thought to be extirpated east of the Mississippi.<sup>50</sup>

Only a small population in Florida, the now critically endangered Florida panther, remained.

In the 1930s, scientists began to study cougars and their role in their ecosystems. In the 1950s and ‘60s, states ended their bounties. In 1967, Florida panthers were listed as endangered, and in 1973, the eastern cougar followed suit.

In the 100 years since its presumed extirpation, the eastern cougar was not extinct, but a mystery. Surely, we had not killed the animal. It was rare and elusive, and it hid itself well, but surely, people said, it was not extinct.

And so, it was not declared extinct. It was listed under the federal Endangered Species Act in 1973, despite the animal having almost disappeared in its historical regions. In 1982, the Fish and Wildlife Service drafted a recovery plan in the hopes of creating at least three reproducing populations.<sup>51</sup> No success.

In 2011, the FWS conducted a full review of the eastern cougar, pulling data from 21 states and over 100 studies dating back to 1900.<sup>52</sup> No evidence of a successful, breeding eastern cougar population was found.

In 2015, the FWS recommended formally delisting the eastern cougar.<sup>53</sup> The Service offered a 60 day public review and comment period. No substantial evidence was submitted.

On January 21, 2018, the FWS declared its intent to delist the eastern cougar from the Endangered Species Act, declaring it extinct. Its name was officially removed February 21, 2018.<sup>54</sup>

Each year, hundreds have reported sighting the eastern cougar in the forests and mountains of the east. No true eastern cougar sightings have been confirmed.

#### **IV. EXTINCTION IN APPALACHIA**

The cubs followed their mother through the woods as she guided them to her kill. The mother was careful and lithe, her paws pressing silently against the earth, but the cubs were jubilant and energetic, not yet aware of what it meant to be a cougar in the forest.

Occasionally the kittens mimicked their mother, traipsing with long strides and hunched shoulders between trees and brush, but oftentimes they were comfortable tumbling aimlessly after their guardian, pouncing and nipping at one another.

They knew when they were safe by the way their mother's body moved.

The scents enveloping the family changed. A spring storm had washed the forest in the sweet scent of warm rain. As they migrated toward the mother's cached deer, approaching the edge of the forest, the rich, floral scent of the forest disappeared, and trees became sparse.

Through the remaining trees, the cougars could see stretches of fields, dry and dung-scented. The land seemed not to stretch as far when the mother was a cub.

The mother's gait grew stiffer, quieter, more cautious as the scent of corn overtook them.

The kittens leapt over and wriggled under fallen branches and logs, working to keep up, staying close to their mother's flank as she stepped over the succession of trees with ease.

The mother sought the scent of her cache. The deer was fresh, only killed on last night's hunt, so the alluring, metallic scent of the deer's exposed flesh would become overwhelming once they were close.

The cougar found a different scent first: a human.



The story of the eastern cougar's extinction is not unique.

In the Appalachian mountains, countless animals have gone extinct, extirpated, or missing.

**The bison of the East.** Bison once roamed the dense forests of Appalachia, and their herds carved paths through the woods that were used by Native Americans and, later, early Europeans.

Biologists say the bison roaming Appalachian forests were migrant Plains bison, *Bison bison bison*, who crossed the Mississippi in the 1500s. They were once so prolific that folklorist Henry Shoemaker believed them to be their own species, the Pennsylvania bison, *Bison americanus pennsylvanicus*.<sup>55</sup>

*The legs were long, and fore and back legs evenly placed, the heavy front and meagre hind quarters of the western bison were not present, in other words the Pennsylvania bison was a beautifully proportioned beast. He was an agile runner and climber, carried no superfluous flesh, was adapted in every way for life in a rough, mountainous country.*

-Henry Shoemaker, "A Pennsylvania Bison Hunt," 1915<sup>56</sup>

Shoemaker's writings have been largely discarded, often lacking evidence, but his works were so canonized that they became a part of the bison's lore nonetheless.

Even today, the eastern bison's brothers of the West are viewed with awe, its populations protected in national parks and its lore imbued with a sense of majesty and wisdom. In many Native American cultures, bison are revered as givers of life, and to ecologists, they are animals who have come back from the very edge of extinction.

*When my mom was going through chemotherapy, she read a book about a cancer survivor. He wrote his own memoir, called Where the Buffalo Roams. He used the buffaloes' coming back from the brink [of extinction] as a metaphor for his own cancer survival and cancer survivors in general, and that always stuck with me. Bison are amazing animals. They're sources of inspiration for a lot of people for a lot of reasons, for indigenous people for cultural and traditional reasons, for cancer survivors. That has stuck with me since I was 23 -- almost 20 years.*

-Laura England, ecologist, lecturer at Appalachian State University<sup>57</sup>

In the east, the bison of Appalachia have not returned.

Their herds were smaller than the massive herds of bison grazing the western plains, often only 50 to 100 head but rarely exceeding 500. They were mild-natured and gentle, easy to kill.<sup>58</sup>

*The buffaloes were more frequent than I have seen cattle in the settlements, browsing on the leaves of the cane, or cropping the herbage on those extensive plains, fearless, because ignorant of the violence of man. Sometimes we saw hundreds in a drove, and the numbers about the salt springs were amazing.*

-Daniel Boone, Kentucky, 1769<sup>59</sup>

Overhunting wiped out the bison completely. The last complete herd was slaughtered in the winter of 1800, and the last known individuals, a lone mother and her calf, were shot in 1825.<sup>60</sup>

**The eastern elk.** *Cervus canadensis canadensis*. The eastern elk, whom Native Americans called the wapiti, were gentle giants. They stood five feet tall, and males' antlers were up to six feet long.<sup>61</sup>

They were about six times larger than any of the largest white-tailed bucks we can see today.

The wapiti roamed in large herds from eastern Canada south to the Carolinas, and they were revered among Native Americans and Europeans alike for their size, their grace, and their flesh.

*The wapiti is the largest and stateliest deer in the world. A full-grown bull is as big as a steer. The antlers are the most magnificent trophies yielded by any game animal of America, save the giant Alaskan moose. When full grown they are normally of twelve tines... The length, massiveness, roughness, spread, and symmetry of the antlers must all be taken into account in rating the value of a head.*

-Theodore Roosevelt, "The Deer Family," 1902<sup>62</sup>

Like the eastern cougar and bison, the eastern elk fell, too, to humans' hunting.

The last known eastern elk was shot in Pennsylvania on September 1, 1877.<sup>63</sup>

The blood of the eastern elk, however, may have survived. In 1905, Roosevelt gifted 18 elk to Fiordland National Park in New Zealand. They were survivors of a shipment of 20, half from Yellowstone National Park and half from a Native American game reservation in Massachusetts.

The Massachusetts elk were believed to be eastern elk captured by Native Americans, allowed to proliferate and keep the last of their bloodline alive in the glacier-carved fjords of New Zealand.

Since the eastern elk's extinction over 140 years ago, successful western elk populations have been introduced in Pennsylvania, Ontario, Kentucky, Tennessee, Virginia, and areas of the Great Smoky Mountains.<sup>64</sup>

**The Carolina Parakeet.** The Carolina Parakeet, *Conuropsis carolinensis*, was the only parakeet native to the eastern United States.<sup>65</sup>

They were brilliantly colored, their feathers painted with vibrant oranges, yellows and bright greens. They were found from southern New York and Wisconsin south to the Gulf Coast, and they made their home in old forests veined with rivers and streams.

A plethora of threats, most all caused by human presence, led to the Carolina parakeets' extinction in 1918.

Their habitat was destroyed when humans wiped out acres of forest at a time to make room for towns and farms. As agriculture spread, farmers came to view the parakeets as a threat to their crops, shooting them out of the skies.

Their beauty quickened their downfall as well -- their vibrant feathers were a prized accessory to women's hats.

When a parakeet was shot, its wounded cries called out to the rest of its flock. The other birds circled around their fallen member, and hunters took them out while they mourned.<sup>66</sup>

A poultry disease was the last blow in the extinction of the Carolina parakeet. The birds' learned ability to live along humans' borders did them in.

The last wild Carolina parakeet was shot in Florida in 1904, and the last captive bird, named Incas, died at the Cincinnati Zoo on February 21, 1918.

He died in the same cage that Martha, the last known passenger pigeon, died in four years earlier.

The Carolina parakeet was formally declared extinct in 1939.<sup>67</sup>

Even these animals are not alone. Countless other species have gone extinct at the hands of humans, and countless more will perish with every generation going forward.

Human activity, barreling up the mountain face with urbanization, hunting, and mining, is burning through the biodiversity of Appalachia and leaving endangered animals in its wake.

## **PART V. THE SIXTH EXTINCTION**

The mother froze, calculating her next move. She could see the human pacing the edge of the forest, surveying his land. He held a rifle. The cougar had seen humans with guns before; they shot one of her first mates years ago.

She stepped backward, her body stiff, and began to turn around. She was almost never inclined to attack a human, especially once she knew what men were capable of.

Things were different with cubs, when she had something to defend, but at 50 feet away, fighting would not be an option.

Her eyes were frozen on the human when he heard a twig snap under a cub's paw. He turned, and their eyes locked.

Her body felt like fire and ice, burning to get away from the threat, to take her young away, but her body was silent, paralyzed.

She took another step back, not taking her eyes away from the hunter. Her cubs followed suit, moving backward into the foliage.

The human's eyes blazed. He lifted his gun, and the mother turned to run.



Scientists have divided the earth's history into five distinct mass extinctions, five moments in which extinction's flames have blazed across the face of the planet.

Many scientists agree we are now witnessing the sixth.

The first occurred 439 million years ago, as the earth transitioned between the Ordovician and Silurian periods.<sup>68</sup> Proliferating plants, and silicate exposed in the uplift of the Appalachians, drank the carbon dioxide from the air. A short, severe ice age wiped out 86 percent of the earth's species.

During the late Devonian period, 375 million years ago, the second mass extinction devastated trilobites. Once one of the most abundant and diverse classes, trilobites were suffocated by algal blooms when new plants' deep roots dug through the earth, releasing rich nutrients into the ocean. The planet suffered 75 percent species loss.

"The great dying," the third mass extinction, almost ended life on earth.<sup>69</sup> It was 251 million years ago, just as the Permian period ended, when a volcanic eruption in Siberia released



unprecedented amounts of carbon dioxide into the atmosphere, raising temperatures and acidifying oceans.

Ninety six percent of species went extinct. All of life today has sprung from the four remaining percent.

The fourth extinction was seen 200 million years ago, at the end of the Triassic period. No clear cause has been found, but scientists suspect that this extinction was dealt in many blows: an asteroid impact, climate change, and a series of volcanic eruptions. Eighty percent of species were lost.

The fifth extinction, the last the earth has known so far, we've mythologized as the dying of the dinosaurs. Sixty five million years ago, at the finale of the Cretaceous period, the extinction began with climate change and volcanic activity and ended with the impact of a great asteroid.

Only a few ammonites remained, the oldest surviving being the nautilus, the deep sea-faring mollusc in whose shell we find the spiraling golden ratio. Seventy six percent of species lost.

Scientists say we are watching--nay, causing--the sixth mass extinction of our planet.<sup>70</sup>

With climate change and human activity booming, extinction has increased to between 10 to 100 times its normal rate. The vertebrate species that have gone extinct in the past century would have taken 800 to 10,000 years to disappear in the world before humans.<sup>71</sup>

At its average rate before 1500, nine vertebrates would have gone extinct between 1900 and this moment. In reality, 477 have disappeared.<sup>72</sup>

Worldwide, approximately one in four mammals, one in five reptiles, and one in eight birds are endangered.<sup>73</sup>

*The evidence is incontrovertible that recent extinction rates are unprecedented in human history and highly unusual in Earth's history. Our analysis emphasizes that our global society has started to destroy species of other organisms at an accelerating rate, initiating a mass extinction episode unparalleled for 65 million years.*

*If the currently elevated extinction pace is allowed to continue, humans will soon (in as little as three human lifetimes) be deprived of many biodiversity benefits. On human time scales, this loss would be effectively permanent because in the aftermath of past mass extinctions, the living world took hundreds of thousands to millions of years to rediversify.*

-Ceballos, et al., "Accelerated modern human-induced species losses"<sup>74</sup>

In Appalachia, it is some humans' thirst for outward and upward expansion that fuels the spread of extinction.

*It's an alienation from what matters to us, really deep inside what gives us life. You can look at that disconnection in an economic sense. We built this sort of extractive economy that doesn't really respect the natural resources they are built on. That's one symptom of disconnection. I think that the way that many of us live our lives on a day to day basis is very disconnected from life, from the vibrancy of life that surrounds us. And I think that everything else falls from that. If we're looking for underlying causes, I don't think it's really a scientific question so much as what motivates humans and our institutions to behave in a way like biodiversity doesn't matter.*

-Matt Wassan, ecologist, director of programs at Appalachian Voices<sup>75</sup>

## **PART VI. BIODIVERSITY IN APPALACHIA**

The cubs kept running. They were of the same litter, but the male was already slightly larger, his muscles propelling his small, lean body faster away from the deafening sound of it all.

The female felt herself falling behind and veered east, toward their den. She found the scent of her mother, and their nook in the rock, and picked up speed. It would keep her safe for the night.

Her ears were still ringing with the sound of the gunshot. She mostly remembers seeing leaves and darkness, foliage enshrouding her, protecting and blinding her. But she saw her mother fall heavily to the ground, the hunter looking to the woods, over the cubs hiding in the brush.

She finally found the den, sprinting the whole way. Her legs ached. Her heart raced and throbbed; it was as though she could feel each rush of blood through her body.

It took hours to fall asleep. Her heart finally slowed enough for her exhaustion to consume her, and she nestled deeper into the leaves.



The Appalachian Mountains' unique climate, elevation, and diverse terrain allow for some of the most unique biodiversity in the world.<sup>76</sup>

As species climb the mountains, changing elevations make for diverse topographies and climates, and ecosystem stability has allowed species to remain successful even while isolated to one river or mountain peak for generations.<sup>77</sup>

The region has the greatest salamander diversity on the planet; 72 species roam the wet forest floors and river banks of the Appalachians, more than half of which appear nowhere else in the world.<sup>78</sup>

One species, of the lungless salamander family Plethodontidae, was discovered in the foothills of Georgia in 2007. It was so distinct it warranted an entirely new genus, the first amphibian genus discovered in the U.S. in fifty years.<sup>79</sup>

As humans urbanize these mountains, however, endemic species dwindle in the face of human activity, namely habitat destruction and climate change.

Native animals who once ruled the mountains and forests of Appalachia are now facing endangerment and potential extinction.

The *Plethodon yonahlossee* salamander, the largest of its genus and one of the most well-known salamanders of the Southeast, has experienced a decrease in body size over the last 55 years.<sup>80</sup>

As lungless amphibians, salamanders are gravely affected by climate change, and as the mountains grow warmer, *P. yonahlossee* has struggled to thrive and grow. The species lives only in the southern Blue Ridge Mountains.

The red wolf, another predator haunting the eastern cougar's old range, is critically endangered; only 40 wolves remain in the wild, reintroduced into eastern North Carolina by humans in 1987 after they were declared extinct in the wild in 1980.<sup>81</sup>

Like the cougar, hunting and habitat destruction destroyed the original red wolf.

The spruce-fir moss spider is found only on four of the highest mountain peaks in North Carolina and Tennessee.<sup>82</sup> Logging, burning practices, and air pollution have landed the spider on the endangered list.



Human activity has cost animals their lives and homes for many reasons. Animals like the eastern cougar and the red wolf were destroyed because of early Europeans' fears.

As Europeans became Americans, establishing agriculture and eventually the Industrial Revolution, other animals lost their homes to crop fields and suburbs, were labeled as threats and pests to urbanization, and have struggled to adapt to changing temperatures and atmosphere as climate change has climbed up the mountain.

Today, new issues have made their way to the mountains. Mining and climate change are among the most prominent.

While the coal industry may be beginning to slow, mountaintop removal still robs the mountains of wilderness and resources, destroying the homes and lives of species in the mines' wake.

By 2009, nearly 1.2 million acres of land, and 500 mountaintops, had been destroyed by surface mining and mountaintop removal mining in Appalachia.<sup>83</sup>

Even “reclamation” efforts often do little to return the land to its former inhabitants.<sup>84</sup>

Coal companies usually receive waivers to use the land for “economic development.” One study reported that of those sites, 89.3 percent had no verifiable proof of development. Most sites receive little more than a dusting of grass seeds. Water quality is tainted by runoff and dumped waste products. The soil is so ruined it can no longer support new forests. Animals’ homes cannot return to their natural state.

Climate change is one of the most discussed, and controversial, environmental issues shaping our planet, and Appalachia has not gone untouched.

Many species endemic to Appalachia rely on the stable climate of these mountains; the peaks’ rugged ability to remain the same as the world changes around them allow some of the rarest animals in the country to thrive.

The mountains, however, are beginning to change.

Since the 1970s, scientists have recorded five to 15 fewer days of freezing weather per winter.<sup>85</sup>

Projections show severe changes to come, with eight fewer inches of rain per year in southern Appalachia possible.

As climate change continues, Appalachia will see fewer, but more powerful storms of precipitation, with longer droughts in between.

A Pennsylvania simulation, offering an area of forest higher temperatures and changes in precipitation, watched older, taller trees sprout leaves and blooms far earlier than usual.<sup>86</sup> Younger and shorter tree species rely on the edges of spring and fall, when taller trees’ leaves aren’t blocking the sun, to gather light and grow.

As taller trees grew and blossomed earlier, shorter trees were unable to succeed.

As this trend continues in natural forests, reproduction could dwindle, and shorter, less competitive species could die out altogether. A biodiversity cascade could ensue.

Animals who rely on Appalachia’s specific temperatures and humidities could face a similar fate. Salamanders, who thrive here like nowhere else, are shrinking in body size, and as dry heat climbs up the mountain, salamanders may have nowhere left to migrate.

Native trout are already in danger.<sup>87</sup> Between 53 and 97 percent of trout populations in southern Appalachia could die out if stream temperatures continue rising. Trout are already at the southern

limit of their range; if any more temperatures climb, the fish would be forced to migrate north or die.

Direct human activity, like mountaintop removal mining and other forms of mining, deforestation, overhunting, and pollution, are costing animals their homes. Climate change is an even broader issue. It will affect every ecosystem and species, including ours.

As with the story of the eastern cougar's extinction, many are still in denial about climate change. In America, although only 14 percent don't believe in climate change, over a third don't believe humans are influencing climate change, and over half don't believe it is harming their generation.<sup>88</sup>

The eastern cougar likely went extinct by 1900, but it was because of human legend that the animals were not declared as such until 2018. Misinformation, miscommunication, and denial of humans' ill-intentioned practices allowed society to believe for over a century that the eastern cougar's extinction never truly occurred.

The same cannot happen with climate change. If we allow denial to persist rather than confronting our own production and consumption of carbon-emitting energy, extinctions like the eastern cougar's will continue, and the biodiversity in Appalachia and the world will cascade.



Luckily, there is still hope. Although climate change is scaling the Appalachian mountains, the region is recognized for its stability in the face of surrounding change.

The Central Appalachians are what is known as a climate change "stronghold," a region whose ecosystem is hardy enough to resist environmental change.<sup>89</sup> At 1.2 billion years old, Appalachia's long geologic history has gone mostly unchanged; for the most part, these mountains are stable, and that allows for the sense of tradition and vibrancy that draws some to the Appalachians today.

*They're just vibrant with life in a way that even the Pacific Northwest, which I spent a lot of time in-- those mountains are just incredible. But the diversity of life here is even greater. This time of year, you can go on the Grandfather Mountain lookout and you can just see the bones of these mountains. They're hundreds of millions of years old, and the life that's on them has evolved there for hundreds of millions of years. It's these sort of intact ecosystems that make you think the Appalachians are more alive than the mountains in Washington or something. I love the northern forests, don't get me wrong, but they got glaciated again and again and just wiped everything out, you know. It just, it all mixes here in the southern and central Appalachians, and it really just creates a kind of vibrancy.*

-Matt Wassan, ecologist, director of programs at Appalachian Voices<sup>90</sup>

The resilient region may be able to withstand the drought NASA predicts will sweep the continent by the end of the century, and provide a safe haven for migrating species.<sup>91</sup>

Central Appalachia, the approximate middle third of the Appalachians that spans from North Carolina to Ohio, supports some 7,542 species, not including the microscopic ones.<sup>92</sup> With elevations up to 4,861 feet, all nine geological classes exist here. Because of its complex folds of geophysical regions and climates, Central Appalachia is a resilient safe haven for many species and communities.

As endemic salamander populations decrease, others migrate upward to take their place. Trailing the stream behind her parents' house, a five year old girl found a salamander her mother, an ecologist, had never seen there before. Laura England, an ecologist, university lecturer, and mother, believes she found the southern two-lined salamander, a species whose native range did not include Appalachia.

*They're not supposed to be up here, they're from the Piedmont foothills area. All the information I found online and maps that show their range -- east of Wilkes county even, they're not supposed to be here. And my five and a half year old daughter said, "It's probably because it's warming. They're coming up here because it's warming." And part of me -- my heart was sort of really proud that she was already thinking like an ecologist, but also sort of shattered that here a kindergartner is already aware of this global crisis. She doesn't have the grief associated with it yet that I carry on a daily basis, but that'll come.*<sup>93</sup>

Whether the salamander was a lone migrator or a sign of an impending migration is unknown.

Historically, birds like the Carolina wren and the Carolina chickadee spend all year on Mount Mitchell. Rather than migrating, the birds simply change their elevations through the seasons.<sup>94</sup>

This is Appalachian resilience.

The Appalachians are not immune to climate change. Its effects are slowly becoming visible in the life of the mountainscape. But the unique diversity of Appalachia's wildlife and climate will give the region more time, perhaps allowing humans an opportunity to conserve some of our most valuable ecosystems, before it's too late.

Perhaps it is not too late for the eastern cougar as well. Although the original populations have likely completely vanished, cougars are naturally beginning to migrate to the eastern cougar's range, replenishing Appalachia's forests and mountains with the forgotten big cat.

## **PART VII. THE RETURN OF THE EASTERN COUGAR**

The female cub was back at the cache. Her limbs felt stiff with fear, but she had spent two nights away, and her hunger was beginning to eat through her middle.

She passed her mother's body on the way, smeared with blood.

She had little to rely on; she had never had to track the scent herself before. But she remembered the smell of deer flesh, and once the smell of iron hit the breeze, she moved instinctively.

The cub arrived at the cache. It had been three nights since her mother had killed the deer; it was almost past its prime. The cougar pushed aside the grass and leaves burying the deer. The muscle and fat filled her. She exhaled in relief.

The kitten heard a rustle in the brush behind her; fear ripped through her like fire once again.

She turned to face the sound. Eyes reflected from within the bush; icy blue, with hints of golden brown creeping through.

Her brother had found the cache as well.

Neither knew fully how to hunt, but their senses each led them to the cache, the smell of blood, and they wouldn't have to hunt on their own just yet. That was a start.

Frogs and crickets quieted as dusk turned to midnight. The cougars traveled once more to their mother's den.



Though the eastern cougar is long gone, cougars are slowly making their way to the eastern cougars' former range. Verified cases of cougars traversing eastern land are increasing; some of them are cougars migrating from the west.

The cats have already begun colonizing the Midwest.<sup>95</sup> Between 1990 and 2008, 178 cougars were confirmed in the Midwest. Their numbers were growing exponentially, with the number of cougars confirmed annually at its highest the last year of the study.

Cougars have also already found their way to the east. True cougar sightings have been confirmed in Kentucky, Tennessee, Connecticut, and New York, suggesting cougars may be migrating to the Appalachians.

Most migrators are males; male cougars need larger territories and are competitive with other males.<sup>96</sup> They have been known to travel upward of hundreds, or in very rare cases thousands, of miles to find new territories.

Females often don't need to travel as far, which may pose a problem in cougar recolonization efforts in the future, but females do roam. The 1990-2008 study found that a third of carcass-identified cougars traversing the Midwest were female.<sup>97</sup>

Cougars migrate slowly, often camping in hospitable areas for a few days at a time before continuing their journeys to find new habitats and mates.

The Midwest does not have the dense forests and proliferating ungulates of the country's western and eastern regions. The hope is that cougars carry on through the Midwest and continue spreading in the eastern cougar's former habitats.

Wildlife specialists speculate that cougars could re-establish themselves in eastern Appalachian states, like Kentucky and Virginia, in the next 25 to 50 years.<sup>98</sup>

Of course, the same threats which drove the eastern cougar to extinction are still, to some extent, prevalent in human society today.

Fragmented habitat, roads and cars, urbanization, disease, and hunting will still pose threats to cougars looking to reestablish the eastern cougar's range.

Cougars will likely never return to most of their former range.<sup>99</sup> The world is too different from the one eastern cougars disappeared from over 100 years ago. Appalachia, the biodiversity haven, however, may be able to offer these animals refuge.

The sentiment historically felt for eastern cougars may not ever fully dissipate. Many cougar sightings today are driven by fear -- families afraid for their children and pets, farmers afraid for their livestock, and hunters looking to face off against a much larger animal with much larger teeth.

If it occurs, the recolonization of the cougars in their eastern territory may be met with human pushback and loss of cougar lives.

Perhaps this time, however, conservation and education efforts can advocate for the animals' reintroduction.

Organizations like the Cougar Rewilding Foundation are pioneering for the rights of the cougar.<sup>100</sup> CRF advocates for natural and introduced recolonization of cougars in their former eastern range, legal protection and responsible management, and educational reform to address cultural perceptions of cougars as threats.

Ultimately, human acceptance of cougars will be a key step in the reintegration of the animal in Appalachian mountains and forests.



*I think that [cougars can return], as long as people here feel like they are stakeholders in the cougars. I think that if people across all social and economic areas and spectrums can feel like there is a value, whether it's monetary, cultural, or nostalgic, as long as they can feel like they can justify their wellbeing and their peace of mind with the presence of the cougar. I think it does come back to a level of acceptance of [the cougar] as a predator.*

*It's not some bloodthirsty monster and going to be stalking people down. It's not going to be killing as many livestock animals as people fear. It's not going to be a major competitor for game species for hunters. But it is potentially dangerous and there has to be some level of acceptance of that. There has to be a willingness to say that the very, very small risk that is posed by this animal's presence is outweighed by the economic, cultural and other benefits that come with it.*

-Mark Spond, geography adjunct instructor and National Park Service liaison to Appalachian State University<sup>101</sup>

In many ways, cougars may enrich Appalachia and the eastern United States with a healthier and more balanced ecosystem, even for humans. One influential way in which cougars may restore Appalachian ecosystems is through its relationship with the white-tailed deer, the eastern cougar's primary food source.

White-tailed deer are overpopulated in much of the eastern U.S.<sup>102</sup> They hinder tree populations by eating acorns and saplings, destroy vegetative cover used by ground-nesting birds, and they cause more than one million vehicle collisions each year, resulting in over 200 human deaths annually.

Wildlife ecologists argue that the restoration of the eastern cougar to its former territory could prevent 155 human deaths, 21,400 human injuries, and \$2.3 billion dollars over the course of 30 years.

In the same timespan, cougars would be involved in the deaths of approximately 30 people. Though this is less than a fifth of the lives they would save, for some this is an unthinkable risk.

Moving forward, the recolonization of cougars into eastern cougars' former territory will be a milestone in preserving and restoring biodiversity in Appalachia and the country as a whole.

To do so, humans must shed the misdeeds and misperceptions of their past. The eastern cougar, whether or not it was a population of the North American cougar subspecies, will always be another red slash on the collective human psyche: a population of tens of thousands, perhaps hundreds, obliterated solely by human fear and violence.

No matter what we do, it seems cougars are migrating, making their way to Appalachia to restore their original legacy. Cougars roamed this country long before Europeans grew to despise them; this land is their right.

*In the end, it doesn't really matter whether "eastern" cougars are out there or not. What matters is that cougars should be there. Cougars belong in the East by evolutionary birthright. It is the ripening of this idea that makes our time different from Adam Rudolph's [19th century cougar hunter's] day.*

*Still, it will be difficult to actually turn the idea into reality, to bring cougars back. Unlike bears, which have been tamed for nearly a century, and wolves, whose admirable family life is now well known, cougars offer little on which to hang a notion of kinship. They must be accepted on their own wild terms. To find the humility to atone for past mistakes, to find the greatness of heart to share the woods with a being far beyond our ken -- that is the spiritual challenge of the eastern panther.*

-Chris Bolgiano, "Mountain Lion: An Unnatural History of Pumas and People," 1995<sup>103</sup>

All we can do is choose whether or not we want to accept this challenge and be a part of restoring and rewilding these mountains.

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