Three Stories on Urban Wildlife

Kevin J. Moriarty

Follow this and additional works at: https://scholarworks.umt.edu/etd

Part of the Fine Arts Commons, Modern Literature Commons, and the Photography Commons

Let us know how access to this document benefits you.

Recommended Citation
Moriarty, Kevin J., "Three Stories on Urban Wildlife" (2024). Graduate Student Theses, Dissertations, & Professional Papers. 12256.
https://scholarworks.umt.edu/etd/12256

This Professional Paper is brought to you for free and open access by the Graduate School at ScholarWorks at University of Montana. It has been accepted for inclusion in Graduate Student Theses, Dissertations, & Professional Papers by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.
THREE STORIES ON URBAN WILDLIFE

By

KEVIN JAMES MORIARTY

B.A. Geography, University of Louisville, Louisville, KY 2020

Thesis

Presented in partial fulfillment of the requirements for the degree of

M.A. Environmental science and natural resource journalism
The University of Montana
Missoula, MT

December 2023

Approved by:
Ashby Kinch, Graduate School Dean

Jeremy Lurgio, Chair,
Professor of Photojournalism and multimedia
Ray Fanning, Co-Chair
Associate Professor and Director of Faculty Affairs
Joshua Millspaugh, Co-Chair
Boone and Crockett Professor of Wildlife Conservation
Table of Contents

Mammals alter their schedules around human activity........................................ 1

Firefly Futures: Conor O’Shea aims to protect insect species through biodiverse landscape architecture.................................................. 7

Urban deer are running wild in Missoula, Is it time for the city to consider a management plan?................................. 13
Mammals alter their schedules around human activity

Cities provide great opportunities for many animals, as long as they can avoid humans.

Kevin Moriarty

As COVID-19 forced the country into lockdown in early 2020, then PhD candidate, Chris Hansen, was in the midst of his dissertation work, surveying the abundance of wildlife across western Montana. Over the course of four years, Hansen deployed, and re-deployed motion-activated cameras from the suburbs of Missoula, to wild areas 200 miles out from the city. His fieldwork had been cut short by the pandemic, but he had what he needed. At this point, Hansen had collected over a million photos, many of wildlife, but many others that didn’t particularly help with his research. “Just imagine someone playing catch with their dog in front of a camera,” said Hansen, “Sometimes it’ll be tens of thousands of photos.”

Now in his new workspace, the living room of his small apartment, Hansen began taking a closer look at the data he had collected. Missoula, Montana is known for having a healthy population of black bears, but something stood out about the black bear photos he collected. Hansen noticed his photos of bears out in the woods were typically during the day, but just about every picture of a bear in town was at night. And so, sitting in his recliner, working from a laptop with a sleeping baby on his chest, Hansen compiled a figure comparing bear activity in the suburbs to activity in the wild. His hunch was correct, and his findings align with a phenomenon researchers across the globe have observed in mammal species, including the black bear. Mammals are becoming increasingly nocturnal in the urban environment to limit interaction with humans.

“It’s a way for species to coexist with humans, rather than just being completely pushed out of an area,” said Hansen.

As untouched wild habitats continue to shrink globally, researchers like Chris Hansen are beginning to shift their focus to urban environments to understand how species are making use of developed areas, and the ways in which our cities are impacting wildlife behavior. A recent study from researchers at the University of California, Berkeley, and Boise State University found that, similar to the black bear, mammals all over the world are increasing their nocturnal activity in response to man-made environments. The study encompassed 62 different mammal species and...
observed a shift toward nighttime activity in a large majority of them living in and around urban areas. As animals become less able to separate themselves by space from humans, they are separating themselves by time instead.

***

John Rietman lives in Missoula’s Lincolnwood neighborhood in the upper rattlesnake area. Residents in this neighborhood are accustomed to living with wildlife, literally in their backyard, as they live on the edge of the city suburbs. It’s trash day. Rietman is wheeling his trash can out of the garage down his sloped 30-foot driveway on a cool fall morning before the sun has even come up. He knows he can’t put his trash out the night before because it would likely be rummaged through by the time pickup came. This particular morning however, it didn’t matter. As Rietman made the short walk back to his garage, he turned around and saw what he described as the biggest black bear he had ever seen. “On all fours it’s shoulder was halfway up my Subaru Forester windows,” said Rietman.

He watched from his garage as the bold bear pulled a bag of fish guts out of the trash, maybe 30 seconds after he had wheeled it out. Rietman has lived in the neighborhood since 2006 and has seen plenty of bear activity since moving in. Just last fall, he captured images on a motion activated camera of bears walking past his front doorstep in the darkest hours of the night. “After the bars close, we get nobody coming by up here,” said Rietman. He thinks the bears know when there won’t be traffic driving by, and it's precisely that, which may be one of the major factors shifting black bears toward nighttime activity in urban areas.

A 2019 study tracking black bear movements across the state of Massachusetts observed activity indicating bears perceived humans, and their associated noise and traffic as risky, but not necessarily our infrastructure. This makes sense considering that roadway collisions are one of the leading causes of death for bears and other mammals entering urban areas. Bears are seemingly shifting their most active hours to the time of day humans are most inactive. Their study also found that bears living near human development were less afraid to enter urban areas compared to rural bears, indicating they are becoming accustomed to living in more urbanized areas.

There is certainly a lot to like about the suburbs for many animals. In particular, there is food. Whether it's trash, freshly watered flowers, rodents, livestock or vegetables from a garden, there is no shortage of feeding opportunities. But does the reward outweigh the risk? And can that risk be lowered by entering at night? Bear management specialist with Montana Fish, Wildlife and Parks, Jamie Jonkel, says that black bears in Missoula will do their feeding “forays” and travel through the night. He explains that irrigated lawns and well-maintained foliage are a real temptation for black bears. “Some bear looks down and sees this lush green square down in the bottom of the valley,” says Jonkel taking a sip of coffee, “Especially in the fall months, you know, the late summer months, when it's just dry as a bone.”

Not all mammals are on a level playing field when it comes to making use of urban ecosystems. Size, genetic makeup and human perception all factor into species ability to adapt. Leonardo Ancillotto is a postdoc researcher at the University of Naples Federico II in Italy, and co-
authored a study on what traits might best suit mammals visiting and residing in urban environments. He explains how cities can have a “filtering effect” on species depending on what traits they possess. “Urbanization represents a "novel" pressure to wildlife,” Ancillotto writes over email, “Some species may have some traits/characteristics that allow them to cope with such new pressure, while some may not.”

Bats with long, narrow wings, for example, are found much more readily in urban environments than other bat species. A trait that was developed for flying high over grasslands and hunting insects also happens to serve them well in cities. Another major factor that comes into play for wildlife is: how will a human respond to them? A bear, mountain lion or coyote seen in the suburbs would likely be met with an unwelcoming response in humans, while a deer, squirrel or raccoon may blend in and go unnoticed.

***

While many mammals are shifting to a nighttime schedule to avoid humans in urban areas, there is at least one species that may be doing the opposite. Red fox are not especially uncommon to find in urban settings, but they have traditionally used the hours of dawn and dusk to feed and travel. However, researchers across the country have noticed red fox becoming more and more active during daylight hours in urban environments. Animals living in urban environments have to balance the dangers that humans present, with natural predators. For the red fox, that is often a coyote, a species that is extremely nocturnal in urban areas. Scientists think that red fox are increasingly choosing to use daylight hours to avoid interaction with their predator, the coyote. The “human shield hypothesis” explains this phenomenon. Essentially, humans could potentially be a buffer between predators and prey. Red fox may not perceive humans to be as dangerous as coyotes and are choosing to “shield” themselves from their natural predator by becoming more active during the day.

Every mammal species has a different response to urbanization and scientists are still trying to answer the question of what kind of impact this may have. With many mammal species altering their activity to the nighttime, it could be a way for humans and wildlife to reduce conflict with one another and better co-exist. On the other hand, increasing nocturnal activity in species that are typically active during the day raises a host of questions around wildlife community dynamics. Apex predators may lose their ability to hunt prey species living in urban areas or abandon a kill near human development during the daytime. Species may shift their diet toward food that is more accessible at night, creating changes in lower trophic levels. These drastic changes in activity have the potential to reshape entire ecological communities.
Darwin’s theory of evolution through natural selection says that organisms who are better adapted to their environment will tend to survive and produce more offspring. With rapid urbanization happening in areas around the globe and many species being forced to learn how to navigate urban environments, humans may be imposing what is known as artificial selection on wildlife. As many mammal species are forced to shift their activity to the night in urban environments, natural selection may eventually alter species morphological and behavioral traits toward characteristics that are better suited for the night.

Mason Fidino is a quantitative ecologist at the Urban Wildlife Institute in Chicago, Illinois. He says that many animals are “synanthropic misanthropes”, meaning they love the city, but hate the people. Many wildlife species do their best to take advantage of all that the urban environment has to offer while avoiding interaction with humans as much as possible. A city park or wooded recreation area are potentially ideal habitat for many mammal species, but Fidino says that if we are using it at the same time, wildlife will be forced out. “There's only certain species that are going to have the ability to actually modify when they are becoming most active.” says Fidino, but he continues by adding, “I'm just steadily more and more surprised to see how adaptable some species have become.”

***

One way to reduce the detrimental impacts that our cities may have on wildlife species could be to provide ample greenspace within urban areas. Ensuring cities have adequate greenspace has enormous benefits for people, as well as wildlife. Green areas within cities have been shown to improve human health and mental well-being, they reduce temperatures in areas that are otherwise surrounded by heat absorbing concrete and they provide cleaner air. Wildlife benefit from connectivity, and providing ample greenspace within cities may better intertwine them with nature and lessen the impact of urban sprawl. Scientists are still trying to understand how much greenspace is the right amount for both humans and wildlife to better co-exist in cities. If urban planners were to implement large expanses of greenspace within cities, that may ultimately increase the overall footprint of that city on the natural environment, creating increased sprawl.
and commute times for humans. Researchers like Fidino are currently working to answer “How do we leverage what we have in a city? And how can we modify what’s already present within the city in order to make it better for wildlife?”

As mammals seemingly become more adapted to urban living and using our cities and suburbs, will this increase the amount of negative encounters we have with wildlife? Not necessarily. Experts agree that the root cause of conflicts between humans and wildlife in cities often comes down to people doing things they shouldn't be doing. Whether it’s directly feeding wild animals, not sealing up garbage or feeding pets outside, being educated about living with wildlife, they say, is key for us to co-exist, especially in a city like Missoula. “We really beat the drum here, we try to anyways,” said bear expert Jamie Jonkel, “This is Missoula, this is wild country, govern yourself accordingly. People just have to be smart.”

Missoula, Montana is just one example of a city that is rapidly expanding on the wild habitat that surrounds it. Over the course of his dissertation work, Chris Hansen set cameras in over 1,000 different locations and they were triggered by a black bear(s) 570 times. Interestingly enough, as he took a close look at their activity patterns he noticed they are using wild and urban areas at about the same rate, only at different times of day. After collecting and analyzing the vast amount of wildlife data he had, Hansen reflects on his findings, “It’s cool to think that even though we are seeing strong effects of urbanization on wildlife, that there’s still a ton of wildlife around and they still use a lot of the area that we inhabit.”
Firefly Futures
Conor O'Shea aims to protect insect species through biodiverse landscape architecture

Kevin Moriarty
It’s nearly time for class to start as professor Conor O’Shea sits down at his desk in his downtown Chicago office. As he slides a pair of VR goggles over his face, he is transported into a virtual world designed by one of his students. It’s the last natural area left in an otherwise dark and desolate, future version of Chicago void of much life. This virtual world is imagining what the future could look like without insects and pollinators.

Scientists have observed a global decline in insect species in recent decades. A 2019 UN report estimated that some 500,000 insect species are threatened with extinction. Insects are critical for our food web and the ecosystem services performed by insects are valued at an estimated 57 billion to the US economy according to the Huck Institute of Life Sciences at Penn State University.

O’Shea is a certified landscape architect in the state of Illinois and teaches his trade to students at the university of Urbana-Champaign. His teaching, research and client work is all driven by his passion for protecting insects and designing urban landscapes that work for humans and insects.

In his class, O’Shea uses VR technology from Meta’s Horizon Worlds application to lead his students through an unconventional design studio in the metaverse. The application, which launched in 2021, allows anyone with a Meta Quest headset to socialize, explore and immerse themselves in virtual worlds. O’Shea and his students took full advantage of what this nascent technology had to offer. He dubbed the studio “firefly futures,” challenging his students to incorporate knowledge about firefly ecology into landscape design. Based on Chicago’s Humboldt Park neighborhood, student’s imagined future scenarios in the metaverse without fireflies, essentially asking: what might a future version of Chicago be like if we lose fireflies and other insect life that keep the ecosystem in balance?

“We are being critical about the present by creating a science fiction scenario,” said O’Shea about wrestling with the issues fireflies are facing.
Firefly habitat is difficult to find in a city like Chicago. Things like rotten logs, unraked leaves and dense ground cover are seen as eye sores to many homeowners and land managers. There is a culture of “mow and blow,” along with the use of pesticides, to create aesthetically pleasing spaces, but those manicured spaces leave a bare and toxic landscape for fireflies and other insect species.

“The way that landscapes are managed and built in places like Chicago are just absolutely deadly for insects,” said O’Shea, “I just imagine a very different scene that I think really just starts with the plants that will attract insects, which then of course feed birds and other animals all the way up the food chain.”

Scientists have not reached a consensus, but there is evidence that fireflies are in decline in the US and elsewhere, with some species at risk of extinction. The firefly is a species of beetle with the ability to produce a bioluminescent glow. Their glow comes from a chemical reaction in the abdomen and the light that is produced is nearly 100% efficient, meaning little to no energy is lost as heat. By comparison, an incandescent light bulb is only about 10% efficient, with 90% of the energy produced being lost as heat.

This unique bioluminescent glow is also how fireflies find and attract potential mates, but their glow is being drowned out by light pollution. Light pollution is a side effect of urbanization, it is the excess light that comes from developed areas. In densely populated areas, light pollution brightens the night sky. Researchers are finding that artificial light at night may be having drastic consequences on firefly mating rituals. “Artificial light drowns out the firefly’s courtship signal,” explains Avalon Owens, an entomologist and researcher at Harvard’s Rowland Institute.

Owens is working to understand just how much of an impact artificial light at night may be having on firefly mating success. When artificial light is present in a firefly habitat, they are less able to distinguish that light from the glow of a potential mate. Less overall mating success could cause sharp population declines, and this is what has experts worried. She says doing anything and everything we can to limit artificial light at night will aid in minimizing the harm to fireflies, and that much of the problem is from lights being on when no one is using them. “For millions of years the night has been dark. Life on earth has evolved around the cycle of night and day,” said Owens, “If we could just solve lights on when people aren’t there, then I think 90% of the problem would be eliminated instantly.”

With scientists lacking data on firefly populations, much of the evidence for their decline is anecdotal. People just aren’t seeing fireflies where they used to. It’s important to remember that while fireflies exhibit their courtship display in the summer, they are still around the rest of the year. Our activities and landscape practices may be putting them at risk. Fireflies prefer a moist environment and tend to live in meadows and forests, but these habitats are increasingly being lost to human development.

Habitat is extremely important to fireflies. Fireflies spend up to 95% of their life in the larval stage. Larvae require 1-2 years to grow into adults and depend on an undisturbed habitat consisting of leaf litter, rotten logs and moist soil. Ben Pfeiffer is the founder of Firefly Conservation and Research, a nonprofit dedicated to increasing awareness and bringing to light the plight of the firefly in the United States. He says there is now empirical evidence to support the shrinking number of fireflies in the US and the main cause of their decline is loss of habitat. “A lot of previously rural areas are going through a land conversion process,” said Pfeiffer, “They’re going from agricultural or wild habitats to subdivisions or commercial developments.”
Every species has a role to play and contributes to a healthy and functioning ecosystem. Fireflies play a key role in the food chain, feeding on populations of invertebrates like snails and slugs and serving as grub for species like spiders and frogs. Fireflies also contribute to healthy soil; they burrow into the ground allowing sunlight and water to penetrate below (Indiana Department of Natural Resources).

Fireflies can persist in more urbanized areas as long as they have sufficient undisturbed habitat. O’Shea’s office is located on Damen Avenue in a neighborhood with a mix of residential properties, businesses and restaurants. As he walks around the block, he notices the unique urban ecology of downtown Chicago. Some properties are lined with a fake turf instead of grass, others are decorated with plants from foreign countries and others only have enough space for a planter. “I think it’s crazy that we’re filling the landscape with, like mulch, and manicured lawns and injecting them with pesticides and then bringing in imported shrubs that grow well, but don’t do a damn thing in terms of the ecology,” said O’Shea.

As he reaches the end of the street, O’Shea stops next to a seemingly abandoned garden alongside the street enclosed by a short metal fence only about a foot high. The abandoned garden was now filled with tall grass, weeds and other plants that sprung up once it was left unmaintained. O’Shea admired the unkempt garden, noting that it was much more beneficial for local biodiversity than some of the well-maintained gardens. O’Shea’s solution for insect habitat loss in developed areas: creating sectioned off areas that are left to grow wild similar to this garden. Letting nature take its course in designated areas would provide precious habitat for fireflies and countless other wildlife species. “If you want to have a wild and messy yard or garden, you can put something around it that indicates it was intentional,” said O’Shea, “As long as it’s like an intentional mess, then I think people are more accepting of that.”

Urban environments are only growing across the globe. According to the United Nations, over 50% of the world’s population now live in cities and by 2050, 70% of the earth’s population will live in cities. As cities grow, they continue to encroach on wild habitats and reduce livable areas for wildlife. Cities have historically been designed as a sea of concrete with little signs of the natural environment and spare green space. Designing cities that benefit humans, as well as wildlife, will be important for maintaining biodiversity into the future. O’Shea’s aim is to find unique ways to increase biodiversity in cities.

He sees it as his responsibility, whether the client is aware of it or not. O’Shea started his firm Hinterlands in 2015 and describes it as “biodiverse landscape architecture.” Depending on the scale, landscape architecture projects can be extremely costly to implement, and it can take years for an architect to see their work come to fruition in the real world. In the early days of his firm, O’Shea spent much of his time entering design competitions, working to build his unique brand of landscape architecture and expose his work to a larger audience. Design competitions
give early career architects the chance for their work to be seen by seasoned architects and possibly brought to life in the real world. O’Shea describes his competition entries as “my visions for a better future.”

These designs are based solely in the theoretical realm, but O’Shea combines his knowledge of insect ecology and landscape architecture to come up with some eyebrow raising designs. Our cities are built with humans in mind first and foremost, not wildlife, but O’Shea would like to see infrastructure that does multiple things at once.

In his project, The Biodiverse City, O’Shea reimagined standard streetscape elements in a way that would benefit humans and wildlife. Some of his designs include the Bee Bollard (pictured below), a street post with small holes cut out from it to provide habitat for these critical pollinators, the Bird Lamp, a streetlight with small cavities cut out in the post to provide housing for birds, and the Insect Paver, a sidewalk that allows insects to pass underneath. At this point, these are only prototypes, but O’Shea says since doing the project he has had a lot of conversations about it, especially the bee bollard. What he has learned since this project is that a city like Chicago has standard streetscape items that are installed where needed. Creating a custom 3D printed object like the bee bollard would be very expensive and currently not feasible on a large scale. “Sometimes projects like this are helpful to kind of raise awareness or generate conversation, and you don’t know what the outcome is going to be,” said O’Shea.

![Bee Bollard](image)

Conor O’Shea. Hinterlands Urbanism and Landscape

O’Shea received an honorable mention in a 2020 contest for his project “Cicada Code” in the landscape architecture journal LA+. Similar to Chicago’s recent bird friendly ordinance, O’Shea came up with hypothetical changes to Chicago’s municipal code that benefited cicada’s, an insect that only shows up every so often but is expected to emerge in large numbers in and around Chicago in 2024. “It was to say, hey, let’s take Chicago's municipal landscape ordinance and
actually adjust the code so that it will mandate property managers and homeowners manage their land in such a way that it's good for cicadas,” said O’Shea.

O’Shea’s latest project is a native pollinator garden installed just this year for a residential client in Chicago. The garden serves as an ecological stepping stone for native species like the monarch butterfly and hummingbird hawk-moth. The garden is modeled after the natural woodland and prairie environment of the region and will create pollinator habitat in an area that might otherwise be devoid of these native plants. Homeowners can play a very important role in increasing insect biodiversity in urban and rural areas. For those that meet the qualifications, The National Wildlife Federation even offers homeowners and businesses the opportunity to classify their yard or garden as a certified wildlife habitat. “What I would like to see go away is just the use of plants that don’t support native insects or birds,” said O’Shea, “The challenge is, how can you take natural plants, put them together in combinations that people actually think are beautiful and aesthetically striking?”

O’Shea says he will be designing for insects and biodiversity until he retires and he hopes to instill some of the same values and thought processes about the natural world in his students who may become the future of urban landscape design. O’Shea sees it as his responsibility to incorporate elements of biodiversity into his work while also staying up to date on current technology and trends. Meta’s current headset lacks the processing power to design real-world architecture projects. However, more powerful forms of VR can be used to assess projects from a unique perspective, something that student Alex Alonso keyed in on: “That’s been one of the most helpful parts, to be able to build something and then walk around and see how it looks.”

The goal of O’Shea’s firefly futures design studio was to educate students on the threats that fireflies and other insect species are facing and to inspire novel ideas in landscape design. O’Shea believes education is a critical component of making landscapes interesting or palatable to a broader audience. The worlds that O’Shea’s students designed in the metaverse are accessible to the public, and in theory, can spread awareness about firefly decline. “People aren’t necessarily anti-bug, they just aren’t thinking about these things,” said O’Shea.
Urban deer are running wild in Missoula, Is it time for the city to implement a management plan?

Kevin Moriarty

Most Missoula residents wouldn’t bat an eye at the sight of a buck walking down the sidewalk or a group of deer feeding on foliage in their front yard. There is no exact estimate on how many deer live in Missoula city limits, but residents have grown accustomed to seeing them around every corner of the city and many are growing frustrated.

One of the biggest complaints from Missoulians is that the deer can turn gardening and landscaping into a major headache. For deer, the city offers a buffet of green, well-manicured food sources and they go relatively unbothered by humans and pets. The city also provides deer with protection from predators like mountain lions and grizzly bears.

It’s not hard to see why deer enjoy living in the city so much, but they can also make driving more dangerous. According to the Insurance Information Institute, Montana ranks 2nd out of all 50 states for the likelihood of a motor accident involving an animal, with nearly 70% of these accidents involving a deer.

Ryan Klimstra is a wildlife manager with Fish, Wildlife and Parks Missoula. He says FWP receives up to 5-10 calls a day in the late summer about everything from dead deer to vehicle incidents to deer eating vegetation. When it comes to traffic accidents and deer in the road, residents are asked to call the police.

“In order to protect anything that we plant (in the city), we put an exclosure cage around those plants for a few years until they’re large enough to withstand the deer. So, we basically just mitigate against urban deer;” said Jeff Gicklhorn, Missoula’s Conservation Lands Program Manager, “I would venture a guess that there are far more tasty plants on adjacent private property than on city parks and natural areas.”

For years, FWP’s advice has essentially been to mitigate against living with deer. Their website includes suggestions for living with deer including: owning a dog to deter deer, putting up a fence to protect plants and planting vegetation that deer find less favorable.

Randy Arnold has been Missoula’s regional FWP supervisor for over a decade, he defines this issue as one that is just as socially complex as it is biologically. No one knows exactly how many deer are living withing Missoula city limits and there isn’t a clear threshold that would call for action to be taken. The issue often comes down to: What are people willing to tolerate?

“Fish, Wildlife, and Parks is not in a role to tell anybody or the city that there are too many deer and what to do about it. At the end of the day, it’s a community decision,” says Arnold, “I believe the social tolerance for deer is a threshold that we hit before a biological threshold.”

Arnold’s suggestion is to begin with a pilot plan. If a management plan were to be enacted, starting small and targeting areas of the city where deer population is high, and tolerance is low.

“If and when the community’s want to have a conversation around deer management, they have the space and obligation to develop an urban deer management plan, and Fish Wildlife and Parks stands at the ready to support the development of anything like that,” Arnold said.
Josh Slotnick is the Chair of Missoula’s board of County Commissioners, he says the issue just hasn’t made enough noise for it to be acted on.

“It’s come up and the typical response is, well, we better check in with FWP,” Slotnick said. “We have never had a proposal in front of us that we evaluated and looked at the expenses.”

While some residents may enjoy viewing wildlife in their front yard and others may see the deer as a nuisance, there may be another reason to consider managing the number of deer that roam the city and that’s chronic wasting disease or CWD.

CWD is a fatal, neurological illness that effects members of the deer family including moose, elk and mule-deer. It was first discovered in a wild animal in Colorado in 1981 and has been spreading quickly ever since. The disease is currently very low or non-existent in the Western Montana/Missoula area but evidence suggests that it is closing in. Mapping data from USGS, updated November 2023, shows that adjacent towns Great Falls, Libby and Dillon Montana are all dealing with CWD in their urban cores.

The disease can severely impact deer and other species of hoofed animals in areas where transmission is high and is concern for hunters looking to harvest fresh meat. According to the Centers for disease control and prevention, there have been no cases of CWD infection in people. However, studies suggest that it may pose a risk to certain types of non-human primates, like monkeys, and it is not advised to eat the meat of an animal infected with CWD. “Human health, animal health and the health of the environment are all connected,” said Aniruddha Belsare, a disease ecologist and professor at Auburn University.

Belsare compares CWD to Covid-19 in that both can be easily spread in high density areas. “If you have a high-density population where there is a high probability of contact between individuals, then an infectious disease is going to spread rapidly,” Said Belsare, “Those populations would be ideal grounds for a disease outbreak.”

With so many deer clustered in Missoula city limits, this could be cause for concern when it comes to the spread of CWD. Viruses like Covid-19 cannot live outside the body of a host. What’s unique about CWD is that it is caused by misshaped proteins called prions, and these prions can live outside the body of a host. Prions are excreted in all bodily fluids of a deer infected with CWD and these prions remain in the environment, meaning a deer can get infected without even coming in contact with another deer.

In nearby Helena, Montana, the city operates a culling program that has been going on for the last 15 years with meat from captured deer going to feed low-income residents in the city. Sean McCarthy runs the program with his partner Roy Tanniehill. They are members of Helena’s police department specially dedicated to animal control and urban wildlife and this time of year, their biggest focus is urban deer.

Helena’s deer culling program runs for roughly four months out of the year from November to March and by now McCarthy and his partner have the process down to a science. The first step before the culling begins is to get an estimate of how many deer per square mile are in the city by driving around and counting them. Once McCarthy has an estimate he sends that number to Helena Fish, Wildlife and Parks who report back with the total number of deer allowed to be trapped within city limits.

“At what number per square mile do the deer have to spread out and move around on a healthy level that doesn’t spread disease and that lowers conflicts between the animals,” explains McCarthy.
McCarthy and his partner placed 12 traps across Helena’s approximately 16 square mile radius. The program does take a certain amount of community engagement to run, in part because all of the traps are set up on private property. This is so the traps aren’t tampered with and simply because this is where the deer are at.

McCarthy says one of the biggest questions he gets asked is: why can’t the deer be relocated? “In short, they don’t survive it. They’re just too weak of an animal to sustain being moved,” says McCarthy.

When deer are under stress and overexert themselves, a phenomenon called capture myopathy occurs which results in severe muscle damage and often leads to death.

In the first two weeks of culling this year, McCarthy reports that 14 deer have already been trapped. Once a deer is captured and euthanized, McCarthy takes the animal back to FWP’s Helena area resource office to be gutted and stored in a freezer. From there the deer goes to a local meat processor and that meat is sent to Helena food Share, where low-income residents can acquire nutritious food at no cost.

“You can’t get any more locally grown meat than your own city limits,” said Kim Dale, Program Operations Director at Helena Food Share, “We’re incredibly grateful for the meat. I think we got 441 pounds last year.”

It’s not just Helena that has implemented some sort of urban deer management plan, cities across the country are seeing increased densities of urban deer. Kansas City, Missouri sponsors managed deer hunts where certified hunters can apply to hunt in city parks. To keep hunts safe, hunters must be in a tree stand and they must shoot down on their target using a bow or crossbow, no firearms are allowed.

More research needs to be conducted to determine how many deer per square mile is safe and acceptable. This can be tough to answer because every city is unique, and the answer often comes down to human tolerance of deer.

Being born in raised in Helena, McCarthy said he would never want to get rid of all the deer in the city and loves being able to see wild animals in his backyard. Some residents love the program, while others hate it, he said.

“To effectively run a program like this, it comes down to learning how to tread that middle ground,” McCarthy said.
Community Service Specialist Harrell removes a dead buck from SW Higgins Avenue after it was struck by a vehicle during the morning commute. This was the second deer she had removed from the roadway that morning.
Maria Marsolek feeds a buck carrots and oatmeal raisin cookies from her front porch. She says she started feeding the buck after it was hit by a vehicle and now it tends to stay around the neighborhood. It is technically illegal to feed wildlife and officials say that it can do more harm than good for the animal.
A stop sign that has been used extensively as a “buck rub.” Bucks go through a yearly cycle of growing antlers, shedding the velvety fur on their antlers and eventually shedding their antlers. To aid in shedding the velvety coat off their antlers they will often rub them against thin trees or low-lying branches. Recent research has shown that CWD can be spread through scraping behavior if a deer uses the same feature after an infected deer has left prions behind.
A doe stands outside Hellgate high school during a light snowfall. Food sources are abundant in the city, even during the winter months.
Black-billed magpie feed on a deer that was struck by a vehicle. What may be an unpleasant site for Missoulians, is a fresh meal for these scavengers.
During the summer months, fawns can be seen romping around Missoula neighborhoods. Deer raise their young in backyards, parks and vacant land, protected from predators but not from roadway collisions.
Urban Wildlife Officer, Sean McCarthy, stands next to one of the deer traps in the backyard of a home. The traps are made up of a metal frame with industrial fish netting around it. When a deer goes in to eat from the bait inside the trap, a wire is tripped that slams the door shut behind it. Traps are checked every morning. They are deactivated during the day and set at night.
Once McCarthy sees a deer caught in a trap he acts quickly. He collapses the trap on top of the deer and within seconds deer are euthanized with a bolt gun. It’s the quickest, safest and most effective way to euthanize a deer after it has been trapped.
McCarthy and his partner are in charge of processing the deer and storing them at FWP’s region 3 headquarters. From here the meat goes to Old Salt Meat Company for processing and then to Helena food share.