



*New Hampshire*  
**WILDLIFE JOURNAL**

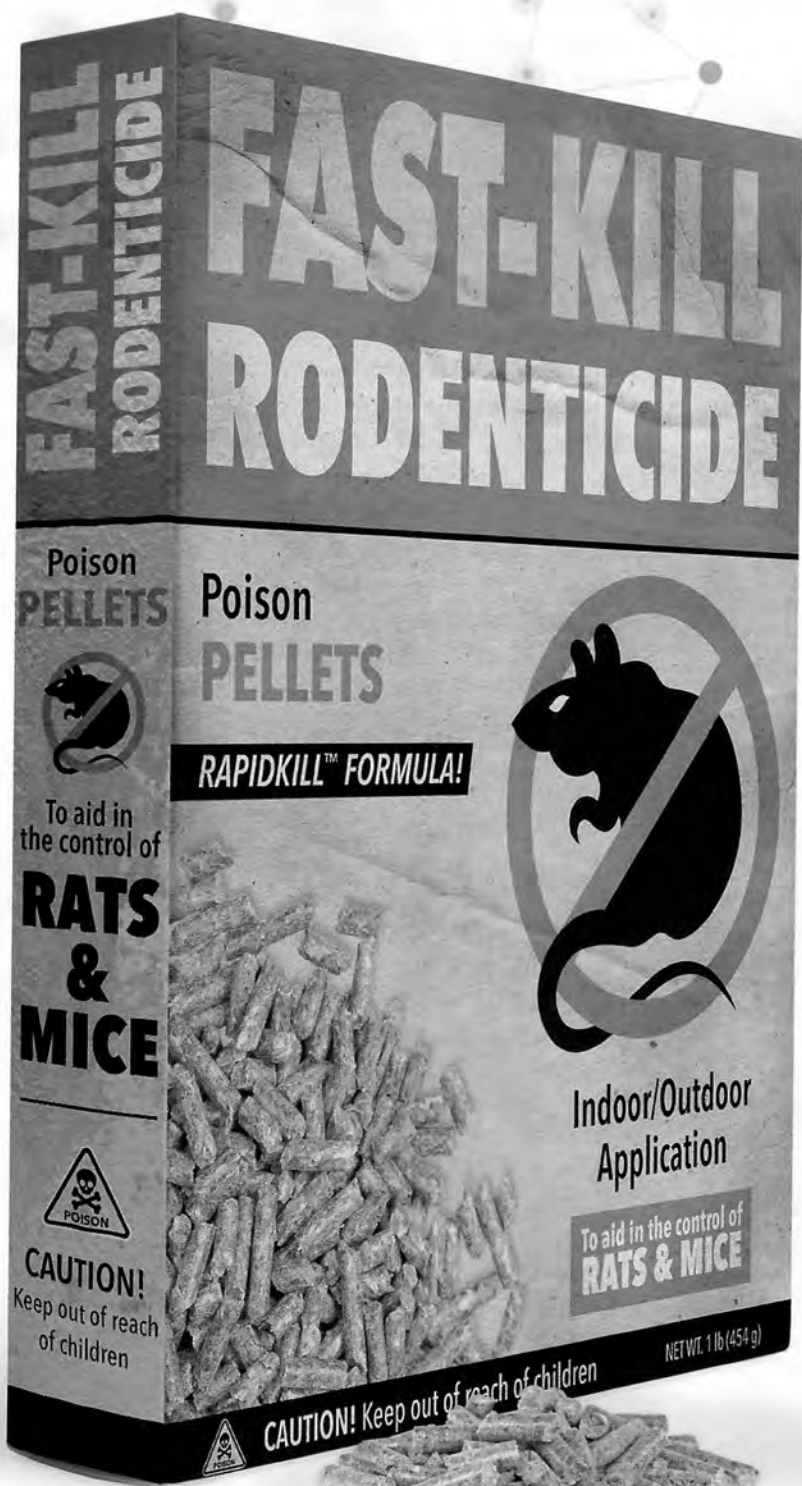
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# Unintended

RODENTICIDES IN NEW HAMPSHIRE'S WILDLIFE



# Harm

• by Patrick Tate •

On many levels, wildlife management is becoming more complicated as our human population increases, the climate changes, and development expands in the Granite State. As the New Hampshire Fish and Game Department's furbearer project leader, I am frequently asked questions about different species. How do I remove this certain mammal from my property? What is going on with this other species? Why do I see more, fewer, or none of some animal?

These questions seem simple in nature, but they can be extremely complex to answer. Population indices obtained through trapper and hunter surveys for species such as red fox, gray fox, and fisher have varied greatly over time and have raised questions as to what factors may be contributing to such shifts in population numbers. An attempt to unravel this mystery led to a generous donation from the Wildlife Heritage Foundation of New Hampshire awarded to NH Fish and Game for the purpose of monitoring and investigating furbearing species statewide. This grant helped with the collection and analysis of a wealth of information and opened up a topic of discussion that is continuing beyond the scope of this initial work.

## Identifying the Cause

One important finding to come from this study involved canine distemper virus (CDV), a naturally occurring virus that affects both domestic and wild animals. In 2016, a new strain of CDV was documented and determined to be unique to New England by a

research team led by Dr. David Needle, DVM, at the New Hampshire Veterinary Diagnostic Laboratory (NHVDL) at the University of New Hampshire in Durham. Through recent monitoring, they established that this regional strain of CDV continues to be present in various furbearing animals across New Hampshire.

The Foundation's grant also led to another significant scientific finding by Needle and his team at NHVDL. Through the collection and testing of red fox, gray fox, and fisher, the work documented that 34 out of 35 animals collected had been exposed to rodenticides, poisons that are commonly used to control mice and rats. Twenty of the animals had measurably elevated levels of rodenticides, while 14 had trace amounts present in their systems. Among all the animals tested, six different poisonous active ingredients were detected, and of those tested, many subjects had been exposed to multiple toxins, which included diphacinone and chlorophacinone, first-generation poisons. The necropsies performed also confirmed the presence of brodifacoum, bromadiolone, difethialone, and dicoumarol, all considered second-generation rodenticides.

First-generation poisons became less effective over time and were replaced by their second-generation cousins to increase rodent mortality once ingested. Both work by preventing blood from clotting through inhibiting the activation of vitamin K. What made this discovery so surprising was that these compounds were found in wildlife samples collected from all parts of the state, including the White Mountain Region and the Great North Woods, which indicated that the toxins were not the result of an isolated incident or unique to more densely populated regions of New Hampshire.

Why had such a high frequency of rodenticides been found in these animals? As I mulled over some possibilities, I remembered a conversation I had with a homeowner regarding pesticide spraying in her neighborhood. As she explained, many people were having their yards treated to reduce the numbers of mosquitoes and ticks. That led me to recall a visit to another home I had made to inspect the remains of an animal on the property. A deceased predator was found on the homeowner's lawn, and their first thought was that it might have gotten into their rodent bait. Through our discussion, I learned that they kept a bucket of rodenticide under the porch to reduce the population of mice in the house. Unfortunately, the decayed creature was too far gone for any type of lab analysis to be completed.

Maria Colby, Director of Wings of the Dawn Wildlife Rehabilitation Center and Bird Sanctuary in Henniker has been noticing an increase in animals arriving with exposure to rodenticides. "Just this past week I had three raptors come in with suspected rodenticide poisoning," said Colby. "Their hematocrit levels (the number of red blood cells) were low and unfortunately they had to be euthanized. I am also seeing exposure in small rodents including chipmunks and red squirrels. People bringing me animals are increasingly confirming that they had been using rodenticides."

### A Dangerous Relationship

Given their intent and increased toxicity, second-generation rodenticides develop in higher concentrations in

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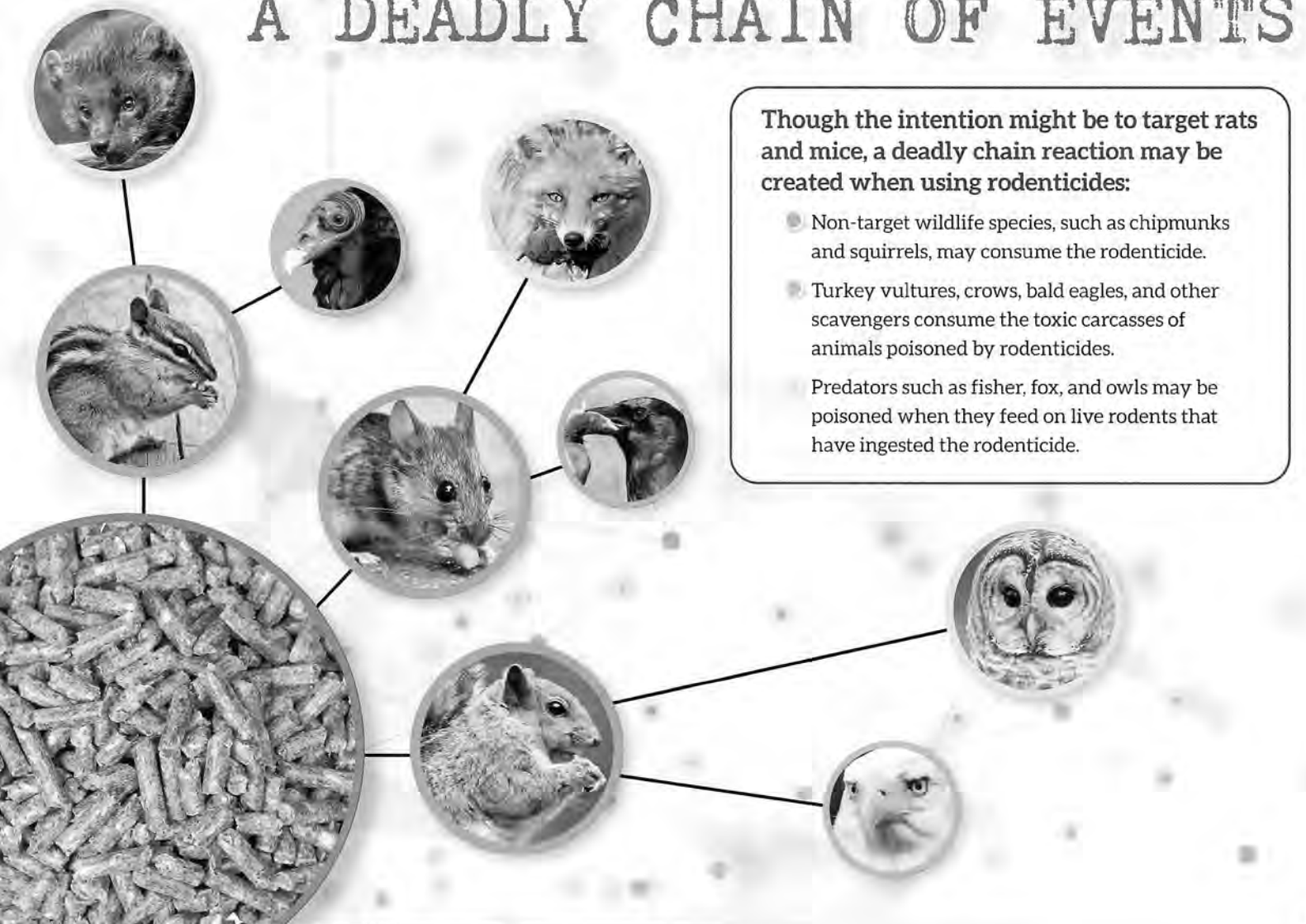
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rodents, and as a result are more lethal to anything that eats them. For rats and mice to ingest a lethal dose from a first-generation rodenticide, they have to eat the bait more than once. When first-generation baits are left out for a week, they are equally as effective as the newer poisons. People, however, want immediate results and the job done yesterday. What makes second-generation rodenticides so much more dangerous to their unintended targets is their potency, because rodents just keep eating them long after a lethal amount has

been consumed. By the time they are dying, these animals may contain so much poison that they can prove deadly to predators who feed on them.

We live in an engineered world where many people believe that there is a human-developed tool to fix every problem. Unfortunately, every action, and every personal decision, has effects. In the words of Jane Goodall, "Every day you live you impact the planet." In the case of rodenticides, humans created a short-term fix for small animal control, and it is now accumulating in various wildlife species that prey on these small mammals. While this has yet to be studied in New Hampshire, predator species may be directly consuming rodenticide baits as well. These findings have raised many questions regarding how rodenticide accumulation affects furbearers' immune response to

## A DEADLY CHAIN OF EVENTS



# • AN OUNCE OF PREVENTION •

## Is Worth a Poisonous Cure

Try following these options to prevent rodent infestations and to avoid resorting to toxic measures:

1. Keep stacks of firewood piled as far as possible from your home.
2. Keep lawns short. Insects thrive in tall grass and are food for mice.
3. Be mindful that bird feeders and spilled seed may also attract small mammals.
4. Remove rock and brush piles, which provide good habitat for small mammals.
5. Seal any holes in your home's foundation where mice or rats might enter.
6. Use snap traps indoors to control rodent population numbers.
7. Hire a professional licensed pest control or wildlife control company if you need "bigger guns." They can safely and ethically manage the eradication process.



For more information on reducing wildlife conflicts, visit [wildlifehelp.org](http://wildlifehelp.org).



To learn more about the Wildlife Heritage Foundation of New Hampshire, visit [nhwildlifeheritage.org](http://nhwildlifeheritage.org).

diseases and viruses, reproduction, normal body function, and even mortality.

When a person places rodenticide on their property, the rationale is most often protection from mice and rats and possibly the reduction of ticks that may carry Lyme or other tick-borne diseases. The solution may work in the short term, but this remedy has serious and far-reaching ecological effects in the long term. In other locations where testing began much earlier than here in New Hampshire, especially states with larger urban centers, cases of documented mammal and raptor deaths have been directly attributed to the rodenticides they ingested when eating their prey.

### Considering the Future

The accumulation of rodenticides in red fox, gray fox, and fisher is alarming to wildlife biologists and others who have a stake in Granite State wildlife. At this

point, biologists don't know how exposure to these poisons will impact wildlife populations in the Granite State without continued observation, documentation, and analysis.



Using rodenticides can have unintended consequences that may affect a number of wildlife species including red fox.

It is a benefit to humans and wildlife to consider the ecological world and to think twice before deciding to use rodenticide baits. Should human health be at risk from a rodent infestation, consider hiring a professional pest control company that is properly trained and licensed. Part of the solution to this emerging problem may involve people taking non-toxic proactive steps and preventive measures to reduce the number of rodents on their property through thoughtful landscape design and home maintenance.



Patrick Tate holds a masters of science degree in Wildlife Biology from the University of New Hampshire and is a Certified Wildlife Biologist. His passion for wildlife has led to a 22-year career with New Hampshire Fish and Game. Tate's favorite place to be is outdoors enjoying nature through the numerous opportunities New Hampshire has to offer.