HARVARD LAW SCHOOL
ANIMAL LAW & POLICY CLINIC

May 13, 2024

Michael Moore, Director, Bureau of Climate and Environmental Health Food Protection Program
Ashley E. Randle, Commissioner, Department of Agricultural Resources
Brian Arrigo, Commissioner, Department of Conservation and Recreation
Dr. Robert Goldstein, Commissioner, Department of Public Health
Richard Berman, Public Member
c/o Hotze Wijnja, Environmental Chemist
Pesticide Board Subcommittee
Massachusetts Department of Agricultural Resources

Via email: Hotze.Wijnja@mass.gov

Re: PETITION TO SUSPEND THE REGISTRATIONS OF ANTICOAGULANT RODENTICIDE PRODUCTS IN MASSACHUSETTS

Dear Members of the Pesticide Board Subcommittee:

We write to request that the Pesticide Board Subcommittee of the Massachusetts Department of Agricultural Resources (MDAR) immediately suspend the registrations of all anticoagulant rodenticide products and conduct an individual review of their active ingredients in accordance with the Massachusetts Pesticide Control Act (MPCA) and its implementing regulations. G.L c. 132B § 7; 333 Code Mass. Regs. § 8.03. This petition is submitted by the Harvard Law School Animal Law & Policy Clinic on behalf of Massachusetts bird rehabilitators Jodi Swenson, Erin Hutchings, and Linda Amato of Cape Ann Wildlife in Essex; mammal rehabilitator Jane Newhouse of Newhouse Wildlife Rescue in Chelmsford; Marci Cemenska of Save Lexington Wildlife; James Joyce II and Patricia Sears-Joyce of Friends of Horn Pond in Woburn; and Laura Kiesel of Save Arlington Wildlife.

As detailed in the enclosed petition, anticoagulant rodenticides do not meet the MPCA's standard for registration because they "generally cause unreasonable adverse effects to the environment." G.L. c. 132B, § 7. Although they are designed to kill rodents, anticoagulant rodenticides also indiscriminately sicken and kill Massachusetts wildlife. Specifically, wildlife rehabilitators in the Commonwealth have reported numerous suspected and confirmed cases of anticoagulant rodenticide poisoning in various raptor and mammal species, such as eagles, hawks, owls, foxes, and coyotes. Notably, among the animals Massachusetts has lost to anticoagulant rodenticides in recent years are several bald eagles, which are a protected species under the Massachusetts Endangered Species Act, the federal Migratory Bird Treaty Act, and the Bald and Gold Eagle Protection Act.

The very nature of anticoagulant rodenticides ensures that animals who hunt rodents will also be poisoned. By design, these toxicants kill rodents slowly, with symptoms setting in days after the poison is ingested. During this lag time, poisoned rodents continue about their daily lives and may be hunted by owls or other animals. These predators, in turn, suffer secondary poisoning. This is

why existing measures to reduce the harms of anticoagulant rodenticides to humans—including requiring the use of tamper-proof bait boxes and limiting over-the-counter consumer access—have utterly failed to stop secondary poisonings of wildlife. As long as rodents ingest these poisons as intended, so will their natural predators. Anticoagulant rodenticides simply cannot "perform [their] intended function without unreasonable effects on the environment" and therefore do not meet the registration requirements of the MPCA. *See* G.L c. 132B § 7.

Anticoagulant rodenticides also injure companion animals, such as dogs and cats, who often require costly veterinary care to treat symptoms of poisoning. Additionally, these poisons are toxic to humans. Many people, particularly children, are exposed to these chemicals every year. Under the MPCA, any consideration of a pesticide's effects on the "environment" must take into account "the economic, social and environmental costs" of the pesticide's use. 333 Code Mass. Regs. § 2.03(4). Thus, anticoagulant rodenticides cause unreasonable adverse effects to the environment not only because they harm wildlife, but also because they harm domestic animals and humans.

Furthermore, although there have been numerous documented instances of the adverse effects of anticoagulant rodenticides on Massachusetts' environment, Petitioners are concerned that MDAR does not effectively track these adverse effects as is necessary to ensure the MPCA's standards are met. As discussed in the petition below, the continued use of anticoagulant rodenticides is therefore unreasonable in light of both the documented harms to Massachusetts' environment as well as the considerable uncertainty regarding the true magnitude of the problem.

We respectfully request that the Pesticide Board Subcommittee act promptly to prevent continued unreasonable adverse effects on Massachusetts's wildlife by suspending the registrations of anticoagulant rodenticides and initiating individual reviews of their active ingredients before determining whether any such product is eligible for registration in the future.

We look forward to hearing from you at your earliest convenience regarding the action the Subcommittee will take. Thank you for your time and attention to this important matter.

Sincerely,

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Enclosures

PETITION TO SUSPEND THE REGISTRATIONS OF ANTICOAGULANT RODENTICIDE PRODUCTS IN MASSACHUSETTS

I. Summary of Requested Action

Anticoagulant rodenticides are a group of potent poisons specifically designed to kill animals by preventing the clotting of blood, resulting in severe internal bleeding that causes a slow and painful death.[1] They include second-generation anticoagulant rodenticides (SGARs) brodifacoum, bromadiolone, difenacoum, and difethialone, and first-generation anticoagulant rodenticides (FGARs) warfarin, chlorophacinone, and diphacinone.[2] Because these poisons are intentionally long-acting, their victims carry the poison in their bodies for multiple days before succumbing to the effects.[3] Any animals that prey on the original victims then become new victims themselves, as their own bodies are subject to the dangers of the toxin they've ingested and the poison begins its cascade through the food web.[4] In this manner, anticoagulant rodenticides carry consequences at once sweeping and severe: they indiscriminately endanger, sicken, and kill countless birds, mammals, and other animals, including a number of protected species, and they pose a grave danger to the health of wildlife populations and even entire ecosystems.[5]

Figures 1, 2. This juvenile red-tailed hawk was found lying on the ground with blood seeping from his mouth in December 2023. The hawk was admitted to Cape Ann Wildlife for treatment where he passed away from second-generation anticoagulant rodenticide poisoning. **Source***:* Cape Ann Wildlife.

In Massachusetts, the dangers of anticoagulant rodenticides are pernicious and pervasive. Of the over 559,000 lbs. of rodenticides applied by professional applicators in the Commonwealth in 2022,

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[1] *See* Mass. Div. of Fisheries & Wildlife, *Wildlife and rodenticide*, MASS.GOV, https://www.mass.gov/info-details/wildlife-and-rodenticide (last visited Mar. 26, 2024).

[2] *See Restrictions on Rodenticide Products*, EPA, https://www.epa.gov/rodenticides/restrictions-rodenticide-products#types (last visited Feb. 19, 2024).

[3] *See id.*

[4] *See* Mass. Div. of Fisheries & Wildlife, *Wildlife and rodenticide*, *supra* note 1.

[5] *See id.*; Ex. 1, Maureen Murray, *Anticoagulant Rodenticide Exposure and Toxicosis in Four Species of Birds of Prey in Massachusetts*, 26 ECOTOXICOLOGY 1041, 1041 (2017); Ex. 2, Laurel E. K. Serieys et al., *Widespread Anticoagulant Poison Exposure is Linked with Immune Dysregulation and Severe Notoedric Mange in Urban Bobcats*, 28 PROCS. OF THE VERTEBRATE PEST CONF. 258, 262 (2018) ("These cumulative investigations strongly suggest that the indiscriminate nature of these ubiquitous toxicants can not only have population-level effects for some species, but potentially also cascade into ecosystem-wide impacts.").

96% were SGARs.[6] These poisons are already taking their toll on the state's wildlife, as evidenced by scientific literature published by researchers at the Wildlife Clinic at the Tufts Cummings School of Veterinary Medicine,[7] and the heart-wrenching deaths of beloved bald eagles,[8] months-old foxes,[9] and many other animals.

In light of the unreasonable adverse effects on the environment that anticoagulant rodenticides cause, we hereby request that the Subcommittee immediately suspend registration of all anticoagulant rodenticide products in accordance with G.L c. 132B § 7, conduct an individual review of these active ingredients in accordance with 333 Code Mass. Regs. § 8.03 and deny future registration of anticoagulant rodenticides until these individual reviews are complete.

II. Interests of Petitioners

A. Jodi Swenson

Jodi Swenson is a resident of Ipswich and the president of Cape Ann Wildlife, Inc., which she founded in 2005 and operates in Essex. Cape Ann Wildlife's mission is to rescue and provide critical rehabilitative care to injured, orphaned, and otherwise impaired birds and ensure their survival upon release back into their natural environment. Ms. Swenson is a licensed wildlife rehabilitator. She holds a state permit authorizing the rehabilitation of crows, pigeons, doves, hummingbirds, songbirds, and a federal permit authorizing her to rehabilitate migratory birds. She does not receive compensation for her wildlife rehabilitation work and operates a small antique restoration business to support herself. Over the years, Ms. Swenson has taken in crows and ravens who appeared to be suffering from anticoagulant rodenticide poisoning. She believes there has been a notable uptick in the number of birds suffering from suspected poisoning in the last several years.

Cape Ann Wildlife has spent thousands of dollars in donations to fund liver testing on suspected rodenticide victims to verify whether poisons were in their systems at the time of death. When additional funding is available, it will instead do a necropsy to definitively assess whether rodenticides caused the animal's death. Liver tests cost approximately $125, while necropsies cost $400; these expenses are significant, as it costs about $800 per month to feed the birds of prey who are most impacted by rodenticides. The money that Cape Ann Wildlife has had to divert to post-mortem testing of suspected rodenticide victims could instead be used to save more lives, improve enclosures, or cover other operational expenses; however, the Cape Ann Wildlife team feels impelled to use their resources to confirm the presence of anticoagulant rodenticides in dead birds' bodies to prove that these poisons are sickening and killing wildlife.

To combat the widespread use of anticoagulant rodenticides, Cape Ann shares the stories of the poisoned birds in its care on social media, alongside photos of the sick, bleeding animals. These posts plead for an end to the use of these poisons.

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[6] Ex. 3, Spreadsheet of data derived from MDAR, *Annual Pesticide Use Information (2022)*, MASS.GOV, https://www.mass.gov/info-details/annual-pesticide-use-information (last visited Mar. 28, 2024).

[7] *See, e.g.*, Ex.1, Murray, *Anticoagulant Rodenticide Exposure and Toxicosis*, *supra* note 5.

[8] *See, e.g.*, Ex. 4, Heather McCarron, *A bald eagle, gone too soon. Wildlife center reports death of MK*, CAPE COD TIMES (Mar. 2, 2023), https://www.capecodtimes.com/story/news/local/2023/03/01/eagle-from-mystic-river-watershed-dies-of-what-experts-call-rat-poison/69958896007/.

[9] *See, e.g.*, Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Nov. 22, 2023, 12:40 PM), https://www.facebook.com/NewhouseWildlifeRescue/posts/pfbid02GFZPJiDWpVn2Vq1q3QVVU83fGEXQ67AiJcDKVhTWuL9FQ6dSkYTfu2woh9zsLHwol.

B. Erin Hutchings

Erin Hutchings is a resident of Gloucester and a wildlife rehabilitator with Cape Ann Wildlife, where she has volunteered for 16 years. She holds state and federal permits authorizing her to rehabilitate hawks and owls. She has also been a vet tech for 30 years and works full time at a veterinary hospital. She does not receive compensation for her rehabilitation work.

Because Ms. Hutchings specializes in rehabilitating raptors who prey on rodents, she cares for birds suspected of anticoagulant rodenticide poisoning. She believes that for the last seven or eight years, the rate of poisoning has increased significantly; when she first started bird rehabilitation, car strikes were the biggest threat to her patients. However, she believes that anticoagulant rodenticide poisoning now exceeds car strikes as being the most common reason that birds are brought to her for care.

When evaluating a bird suspected of having anticoagulant rodenticide poisoning, Ms. Hutchings looks for the following signs: bleeding from the mouth, skin, or feather shafts; dehydration; lethargy; a drooping posture; bruising; a pale mouth; excessive bleeding from minor wounds; blood in the feces; and unusual behavior, such as the bird being found on the ground and easy to approach. She may draw blood to verify whether it will clot unless the animal appears too weak or is already bleeding out. She is unable to save birds who are already at the end stage of poisoning. These animals typically bleed from their chests and choke on their own blood.

If Ms. Hutchings suspects anticoagulant rodenticide poisoning, she initiates the standard treatment protocol, which is a round-the-clock regimen of Vitamin K injections. It usually takes 3-5 days just to stabilize the animal, and a minimum of two weeks to complete the treatment. (The longest a suspected rodenticide victim has been in Ms. Hutchings' care is 3-4 months.) Once the patient appears stable, Ms. Hutchings will do a blood draw to assess whether clotting has returned to normal.[10] If it has not, the treatment must continue. Ms. Hutchings also provides these patients with supportive care, including nutritional support, fluids, and oxygen therapy if the bird's blood count is low. If treatment is successful, Ms. Hutchings can release the animal about a week after the Vitamin K treatments end.

Caring for birds poisoned with anticoagulant rodenticides takes an extreme physical and psychological toll on Ms. Hutchings. She has worked in this field for years and considers herself to be "tough," but it is emotionally draining to witness so much suffering, particularly when she is unable to save a bird despite her best efforts. Seeing bird after bird bleed out and die is "horrible."

Ms. Hutchings initiated Cape Ann's testing of birds and is working with labs to establish reference ranges to help experts assess whether a bird had lethal levels of rodenticides at the time of death. When Cape Ann has sufficient funding available, she will send birds' bodies for necropsies to definitively establish the cause of death.

[10] Blood normally takes several minutes to clot. With poisoned birds, blood may take 24-48 hours to clot, if it clots at all.

C. Linda Amato

Linda Amato is a resident of Malden and works as a wildlife rehabilitator at Cape Ann Wildlife. She has been licensed by the state to rehabilitate mammals and non-migratory birds for 5 years and holds a federal migratory bird rehabilitation permit. Ms. Amato estimates that she spends about $1000 of her own money each month to rehabilitate wild animals to supplement what she receives from Cape Ann. She has cared for squirrels, chipmunks, foxes, and skunks suffering from apparent rodenticide poisoning, and was particularly impacted when a squirrel whom she had cared for as a pup died in her hands of suspected rodenticide poisoning. Ms. Amato has helped with emergency field rescues of raptors suspected of rodenticide poisoning, including birds convulsing and bleeding out. When the bald eagle MK was found in critical condition in a cemetery in Arlington on February 27, 2023, Ms. Amato personally helped transport her to the Birdsey Cape Wildlife Center and felt a deep personal connection as she held the sick eagle in her arms. She was also deeply affected by the impact of MK's absence on her mate, telling a reporter, "We feel terrible. . . . He's looking for her, these eagles mate for life, he's very much missing his mate."[11]

D. Jane Newhouse

Martha Jane Seeker (who goes by Jane Newhouse) is a resident of Chelmsford and the founder and president of Newhouse Wildlife Rescue, a rehabilitation facility for injured and orphaned mammals. She has been rehabilitating wildlife for 13 years and holds a Massachusetts wildlife rehabilitator license. She is also trained as a vet tech. In her work at Newhouse Wildlife Rescue, Ms. Newhouse personally handles intake and triage of injured wildlife, oversees their care during rehabilitation, and, in the event of recovery, orchestrates their releases.

Ms. Newhouse first learned about anticoagulant rodenticides at a wildlife rehabilitation conference where a veterinarian called for rehabilitators to start monitoring the blood clotting rate in predatory patients. Not long after that, she received a pregnant racoon who was bleeding from her eyes, anus, and other orifices. She could not save the mother or any of her four kits. This gruesome experience convinced Ms. Newhouse of the seriousness of these poisons. Since then she has cared for many foxes suffering from apparent poisoning, and has triaged[12] coyotes and raptors who appeared to have been poisoned. She has found that foxes and coyotes with severe mange often also show signs of anticoagulant poisoning. These animals are particularly difficult to treat because they don't respond to treatment as well as they should, and Ms. Newhouse sees a great need for research to understand how anticoagulant rodenticides impact the immune systems of these and other mammals.

Mammals poisoned by anticoagulant rodenticides experience abdominal hemorrhaging, and the best indication of such poisoning is the speed at which their blood clots. When Ms. Newhouse suspects a patient is suffering from anticoagulant rodenticide poisoning, she initiates a round-the-clock Vitamin K injection regimen similar to that used for birds. Ms. Newhouse has partnered with Cape Ann Wildlife to submit fox liver samples for testing to confirm the presence of anticoagulant rodenticides.

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[11] Ex. 6, Michael Rosenfield, *Rescuers Capture Bald Eagle Believed to Be Critically Sickened by Rat Poison*, NBC BOSTON (Feb. 27, 2023), https://www.nbcboston.com/news/local/rescuers-capture-bald-eagle-believed-to-be-critically-sickened-by-rat-poison/2984053/.

[12] Triaging wildlife means the rehabilitator stabilizes an animal and transfers them to a rehabilitator licensed to care for a particular species.

Treating poisoned animals has taken a severe emotional toll on Ms. Newhouse, who describes feeling awful when she witnesses an animal choking on their own blood and taking their last breath. She has experienced compassion fatigue, which is the extreme tiredness and desperation felt by those who witness and try to alleviate others' trauma. The emotional toll is particularly difficult for Ms. Newhouse because she views these deaths as senseless and easily preventable through a ban on anticoagulant rodenticides.

E. Marci Cemenska

Marci Cemenska is a resident of Lexington and founder of Save Lexington Wildlife, a grassroots organization dedicated to protecting wild animals from anticoagulant rodenticides through education, events, and legislative action. She is deeply troubled by the suffering and death that anticoagulant rodenticides inflict on Massachusetts' wildlife; when she first learned about this issue, she was so distressed that she felt compelled to peacefully protest by holding a sign on Lexington Green. Since then, she has spent more than two years engaging in community advocacy to address the environmental harms of anticoagulant rodenticides. Most notably, Ms. Cemenska led the citizen petition effort to get Article 40, which bans the use of SGARs on town property and provides for educating the public on rodenticide hazards, added to Lexington's 2024 Annual Town Meeting.[13] She has also supported state level legislation related to rodenticides by creating educational materials (such as placing items in newsletters, posting on a statewide Slack, and creating bookmarks to hand out to people) and encouraging voters to contact lawmakers. She has also petitioned local businesses, including Whole Foods and the Boston Aquarium, to remove or ban SGARs, and has hosted multiple well-attended public education events about the harms of these poisons.

F. James Joyce II

James Joyce II is a resident of Woburn and founded Friends of Horn Pond in 2022 to identify opportunities for conservation, habitat, and wildlife preservation. Mr. Joyce has been working on the issue of rodenticide poisoning in wildlife since 2015. He directly engages in the rescue of injured birds, including those who have experienced rodenticide poisoning, by responding to calls from the public and transporting the birds to licensed wildlife rehabilitators and wildlife veterinary clinics.

Mr. Joyce spends time locating, identifying, and recording bait boxes found in proximity to injured wildlife, and he communicates with wildlife rehabilitators and veterinary clinics to aggregate information related to second generation anticoagulant rodenticide poisonings, such as toxicology and necropsy reports, maps of bait box locations in relation to injured wildlife, and the kinds of bait used in potential poisonings. In February 2023, Mr. Joyce and his wife Petitioner Patricia Sears-Joyce successfully advocated for the removal of 11 bait stations containing brodifacoum placed at warehouses located on Sonar Drive in Woburn, which is partially located within priority habitat for peregrine falcons—a species of Special Concern—who nested on the cliffs behind the warehouses.[14] In 2024, Mr. Joyce partnered with EarthwiseAware to develop the SGARs Brigade app, which allows individuals in the greater Boston area to use their phones to document potential and confirmed SGAR bait devices and sick or dead animals believed to be victims of SGARs.[15] Mr. Joyce has also given multiple trainings on how to use the app.

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[13] *See* Town of Lexington, Select Board, *2024 Annual Town Meeting Warrant* (Jan. 22, 2024), https://www.lexingtonma.gov/DocumentCenter/View/10687/To-Post---ATM-2024-FINAL-voted-warrant-signed-prevised-2524-105?bidId=.

[14] *See* MassMapper, NHESP Priority Habitats of Rare Species, PH1506, https://maps.massgis.digital.mass.gov/MassMapper/MassMapper.html (last visited May 2, 2024).

[15] *EwA SGARs Brigade*, https://www.anecdata.org/projects/view/1268 (last visited April 24, 2024).

Because Mr. Joyce tracks healthy birds in addition to rescuing injured ones, he has developed personal attachments to several birds who were subsequently lost to rodenticide poisoning. In particular, Mr. Joyce followed and photographed three generations of a family of bald eagles, beginning in the early 2010s with a pair named Ozzy and Harriet, followed by their daughter MK, her mate KZ, and eventually MK's own eaglets. Mr. Joyce was devastated when one of MK's eaglets (25C) died of anticoagulant rodenticide poisoning as a baby, and he experienced an even greater loss in 2023 when MK herself was poisoned by anticoagulant rodenticides. Mr. Joyce spent several days observing MK as she grew increasingly weaker in the Arlington cemetery where she nested with her mate. When she was so sick that she could not fly, the Joyces and Petitioner Linda Amato helped capture and transport her to the New England Wildlife Center, where she died several hours later. Due to his personal connection to MK, developed over years of tracking her and her family, Mr. Joyce was devastated by the experience of trying but failing to save her.

G. Patricia Sears-Joyce

Patricia Sears-Joyce is a resident of Woburn and secretary of Friends of Horn Pond. She has been a wildlife photographer all her life. Along with her husband, she has spent years photographing and tracking the bald eagles who've nested in the Charles River watershed, including Ozzy, Harriet, MK, KZ, and MK's offspring 25C, 26C, 29C, and 46C. Starting around 2016, Ms. Joyce started photographing Ozzy and Harriet, who nested at the Mount Feake Cemetery in Waltham. In fact, Ms. Joyce photographed Harriet just days before she was found dead in her nest in 2021—Massachusetts' first known bald eagle victim of anticoagulant rodenticide poisoning.

Ms. Joyce developed a strong emotional connection to MK as she photographed the eagle from the time she was hatched until the day she was found sickened by anticoagulant rodenticides. To Ms. Joyce, MK was not an ordinary eagle; she would hop from headstone to headstone in the graveyard where she nested, and seemed comfortable in the presence of the Joyces, sometimes landing in the grass within a few dozen feet of them. Because of her familiarity with MK, it was easy for Ms. Joyce to see something was wrong with her when she first got sick. The first day, Ms. Joyce observed MK perched on tree branch with her head sunk low and her eyes closed, not moving. The next day, MK still hadn't moved at all. About twelve hours later, she attempted to fly, but fell off the post she tried to land on. The following day, Ms. Joyce was part of the team that attempted to save MK by transporting her to a rehabilitator before the eagle ultimately perished. Due to her personal connection to MK, developed over years of tracking her and her family, Ms. Joyce was devastated by the experience of trying but failing to save her.

H. Laura Kiesel

Laura Kiesel is a resident of Arlington and founder of Save Arlington Wildlife, an organization committed to ending the use of rodenticides through education, events, and legislative action. She holds a master's degree in natural resources management, is academically trained as a wildlife biologist, and has worked in conservation/environmental policy. Ms. Kiesel's advocacy related to rodenticides started in 2015, when she noticed a pest control company placing bait stations around the affordable housing complex where she lived. Through her wildlife biology training, she understood that the rodenticides in these bait boxes could harm raptors who ate poisoned rodents, as well as the children and companion animals who lived and played in the complex. When she attempted to persuade her landlord to get rid of the poisons, she felt that her housing was at risk: the landlord refused to remove the bait boxes and told her she would be better off living elsewhere. Over the next several years, she noticed bait boxes proliferating throughout Boston. In Arlington,

for example, she noticed bait boxes used all along the construction sites of the Mass. Ave. Corridor Project in 2014-2015.[16]

In 2018, Ms. Kiesel published an article in DigBoston sounding the alarm about anticoagulant rodenticides[17] and organized an educational panel along with Arlington's Animal Control Officer, which was attended by around 100 people. Through Representative Sean Garballey, she also filed a petition and bill with the General Court of Massachusetts to create a commission to study the issue of rodent populations and conduct a comprehensive review of rodent management techniques.[18] In 2021, Ms. Kiesel's second article on anticoagulant rodenticides featured the death of 25C; it was syndicated on Salon.com and nominated for an investigative reporting award by the Association of Alternative News Media.[19] Ms. Kiesel has also testified and organized in favor of successful efforts to ban the use of anticoagulant rodenticides on Arlington town property and to submit a home rule petition to allow Arlington to prohibit the use of these poisons on private property.[20] She has also spoken about the impacts of rodenticides at numerous events.

Ms. Kiesel founded Save Arlington Wildlife in 2022 after a great horned owl mother and her two owlets died of suspected rodenticide poisoning in Menotomy Rocks Park, sparking grief and outrage among locals who enjoyed viewing the owls.[21] The organization provides information and tools to support activists organizing around the issue of rodenticides, and has prompted advocates to form their own local organizations (such as Save Lexington Wildlife, Save Belmont Wildlife, Rescue Plymouth Wildlife, Save Topsfield Wildlife, and more). Save Arlington Wildlife organized the successful petition to get the New England Aquarium to stop using SGARs[22] as well as a campaign to discourage Whole Foods in Arlington to stop using SGARs.[23] The organization also successfully persuaded the Housing Corporation of Arlington to stop using SGARs after nearly 400 Arlington residents signed a petition in support.[24]

Through Save Arlington Wildlife, Ms. Kiesel also organizes fundraisers for Cape Ann Wildlife's necropsies of suspected rodenticide victims and helps coordinate transfer of sick or dead animals to rehabilitators for testing. Ms. Kiesel is generally not compensated for her advocacy work.

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[16] *See* Mass. Ave. Rebuild, Town of Arlington, MA, https://www.arlingtonma.gov/i-want-to/learn-about/projects-around-arlington/mass-ave-rebuild (last visited May 2, 2024).
[17] Ex. 7, Laura Kiesel, *Special Feature: More Potent Than Rodents*, DIGBOSTON (May 31, 2018), https://digboston.com/special-feature-more-potent-than-rodents/.
[18] H.B. 3714, 191st Leg., Reg. Sess. (Mass. 2019), https://malegislature.gov/Bills/191/H3714/.
[19] Ex. 8, Laura Kiesel, *Rodenticides are Killing Animals Way Up the Food Chain*, SALON (Dec. 26, 2021), https://www.salon.com/2021/12/26/rodenticides-sgars-unsafe_partner/; Ass'n of Alt. NewsMedia, *95 Finalists from 35 Publications Grab Honors in 2022 AAN Awards*, https://aan.org/aan/35-publishers-earn-finalists-honors-in-2022-aan-awards/ (last visited May 2, 2024).
[20] *See* H.B. 804, 193rd Leg., Reg. Sess. (Mass. 2023), https://malegislature.gov/Bills/193/HD230.
[21] Ex. 9, Anjali Huynh, *In Arlington, Dead Owls Spark Grief, Raise Poison Concern*, Boston Globe (June 17, 2022).
[22] Laura Kiesel, *Update: New England Aquarium Has Stopped Using Rat Poisons!*, https://www.thepetitionsite.com/224/174/139/demand-new-england-aquarium-stop-using-rat-poisons-killing-our-wildlife/ (last visited May 6, 2024).
[23] Save Arlington Wildlife, *Campaign at Arlington Whole Foods*, https://savearlingtonwildlife.org/campaign-at-whole-foods/ (last visited May 6, 2023).
[24] Housing Corp. of Arlington, *Affordable Housing*, https://www.housingcorparlington.org/affordablehousing/ (last visited May 6, 2023) ("HCA does not use SGAR rodenticide at our properties. [I]n 2022 many Arlington residents signed a petition asking HCA to stop using SGARs (Second Generation Anticoagulant Rodenticide). . . . As of late March 2023, all SGARs were removed from HCA properties.").

Ms. Kiesel developed strong emotional attachments to the eagles and owls in Arlington, including MK and her family and the Menotomy Rocks Park owls. She would visit the owls several times a week, and she thought of them as her neighbors. She was devastated when the mother and owlets died, particularly because the owl's mate was left all alone. Though he later found a new mate, the new mate also died coughing up blood.[25] Ms. Kiesel also enjoyed photographing MK. The eagle's death impacted her so greatly that she keeps a photo of the eagle on a memory shelf alongside the ashes of a beloved cat. Ms. Kiesel describes feeling "pummeled" and traumatized by the onslaught of deaths, which she feels helpless to prevent. Grief and distress over these deaths have caused her to lose sleep.

Ms. Kiesel also notes that these charismatic birds brought the community together—the people who enjoyed observing them formed strong bonds. For example, when MK died, Ms. Kiesel organized a vigil that was attended by over 300 people.[26] However, as these birds have died off, Ms. Kiesel feels this community has been lost.

III. Legal Framework

A. Anticoagulant rodenticides are regulated under the Federal Insecticide, Fungicide, and Rodenticide Act.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) governs the registration, distribution, sale, and use of pesticides—including anticoagulant rodenticides—in the United States.[27] FIFRA endows the U.S. Environmental Protection Agency (EPA) with the authority to register pesticides and regulate their use, storage, and disposal nationwide.[28] EPA will register a pesticide if, among other things, "it will perform its intended function without unreasonable adverse effects on the environment" "when used in accordance with widespread and commonly recognized practice."[29] It is unlawful to distribute or sell any pesticide that is not registered with EPA or whose EPA registration has been canceled or suspended.[30]

EPA classifies each registered pesticide for "general" or "restricted" use.[31] If EPA determines the pesticide "will not generally cause unreasonable adverse effects on the environment" "when applied in accordance with its directions for use, warnings and cautions and for the uses for which it is registered," "or in accordance with a widespread and commonly recognized practice," it is classified for general use.[32] However, if EPA determines that the pesticide "*may generally cause*, without additional regulatory restrictions, *unreasonable adverse effects on the environment*" EPA must classify it for restricted use.[33] Restricted use pesticides may only be used by Certified Applicators and their agents.[34]

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[25] Ex. 10, Save Arlington's Wildlife, https://savearlingtonwildlife.org/2023/02/09/save-arlingtons-wildlife/ (last visited May 2, 2024).
[26] *See* Figure 4, *infra*, p. 23.
[27] 7 U.S.C. §§ 136–136y.
[28] *Id.* § 136a.
[29] *Id.* § 136a(c)(5).
[30] *Id.* § 136j(a).
[31] *Id.* §136a(d)(1)(A); 40 C.F.R. §152.160.
[32] 7 U.S.C. § 136a(d)(1)(B).
[33] *Id.* § 136(a)(d)(1)(C) (emphasis added).
[34] 40 C.F.R. § 156.10(j)(2)(i)(B).

At minimum, EPA must review each registered pesticide every 15 years to ensure that its registration continues to satisfy FIFRA's registration standards, i.e., that the pesticide generally will not cause unreasonable adverse effects on the environment.[35] If EPA determines that a pesticide no longer satisfies FIFRA's registration standard, the registration may be subject to cancellation or other remedies.[36]

Currently, anticoagulant rodenticides are eligible to be classified for general use despite serious concerns about the impacts of these pesticides on wildlife and children.[37] However, EPA has begun to conduct its 15-year registration review and is also preparing a biological evaluation assessing the impacts of rodenticides on species protected by the federal Endangered Species Act.[38] As discussed in Part IV.F.1 below, the agency appears poised to impose further restrictions on these pesticides in light of their serious impacts on wildlife.

B. The Massachusetts Pesticide Control Act allows for registration of pesticides that will not cause unreasonable adverse effects on the environment.

In Massachusetts, the distribution, sale, and use of pesticides are further regulated by MDAR under the MPCA.[39] The MPCA conforms Massachusetts' pesticide[40] laws to the federal requirements under FIFRA.[41] However, MDAR maintains that "Massachusetts pesticide laws are more restrictive than those of EPA."[42]

Under the MPCA, the Subcommittee of the Pesticide Board (hereinafter "the Subcommittee") is tasked with registering all pesticides for use in the Commonwealth.[43] Likewise, the Subcommittee classifies registered pesticides for either "general" or "restricted" use.[44] The Subcommittee shall

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[35] 7 U.S.C. § 136a(g)(1)(A)(iv); 40 C.F.R. § 155.40(a).

[36] 40 C.F.R. § 155.40(a)(2).

[37] Ex. 11, EPA, *Revised Risk Mitigation Decision for Ten Rodenticides* 7 (June 24, 2008), https://www.regulations.gov/document/EPA-HQ-OPP-2006-0955-0764; *see also Active Pesticide Product Registration Informational Listing (APPRIL)*, EPA, https://ordspub.epa.gov/ords/pesticides/f?p=APPRIL_PUBLIC:2 (last visited Feb. 18, 2024).

[38] *See* Pesticide Registration Review; Proposed Interim Decisions for the Rodenticides; Notice of Availability, 87 Fed. Reg. 73,297 (Nov. 29, 2022), https://www.federalregister.gov/d/2022-25978; Ex. 12, EPA, *Rodenticides: Draft Biological Evaluation, Effects Determinations, and Mitigation Strategy for Federally Listed and Proposed Endangered and Threatened Species and Designated and Proposed Critical Habitats* 90 (Nov. 28, 2023), https://www.regulations.gov/document/EPA-HQ-OPP-2023-0567-0004.

[39] G.L. c. 132B, §§ 1–16; *see Town of Wendell v. Att'y General*, 476 N.E.2d 585, 592 (Mass. 1985).

[40] "Pesticide" is defined to cover the same substances regulated under FIFRA. *See* 333 Code Mass. Regs. § 2.03 (defining "pesticide").

[41] G.L. c. 132B, § 1; *see* 7 U.S.C. § 136v(a) ("A State may regulate the sale or use of any federally registered pesticide or device in the State, but only if and to the extent the regulation does not permit any sale or use prohibited by this subchapter."); *see Pesticide Registration, Guidance on FIFRA 24(c) Registrations*, EPA (Nov. 2020), https://www.epa.gov/pesticide-registration/guidance-fifra-24c-registrations ("I]f a state desires to impose an additional restriction to a federally registered product, states may exercise their authority under FIFRA section 24(a) to regulate the sale or use of any federally registered pesticide in the state.").

[42] MDAR, *Register a Pesticide Product in Massachusetts*, MASS.GOV, https://www.mass.gov/how-to/register-a-pesticide-product-in-massachusetts (last visited Mar. 4, 2024).

[43] G.L. c. 132B, § 3A; *see also* 333 Code Mass. Regs. § 2.02 (elaborating on the various roles of MDAR, the Pesticide Board, and the Subcommittee).

[44] G.L. c. 132B, § 7; 333 Code Mass. Regs. §. 8.04. Massachusetts' standards for pesticide classification largely mirror those used by EPA under FIFRA. *Compare* G.L. c. 132B, § 7 *with* 7 U.S.C. § 136a(d)(1). However, in Massachusetts,

only register a pesticide if, among other things, it "will perform its intended function without unreasonable adverse effects on the environment" and "will not generally cause unreasonable adverse effects on the environment" when used "in accordance with widespread and commonly recognized practice."[45]

Similarly, when the Subcommittee classifies a registered pesticide, the classification requires, among other things, a determination of whether the pesticide "may cause" unreasonable adverse effects on the environment.[46] The Subcommittee's classification of the pesticide may be more restrictive than that of EPA.[47]

Pesticides are registered annually and all registrations expire on June 30 of each year.[48] Outside of the annual registration process, the Subcommittee has the authority to conduct an individual review of any pesticide it determines, by majority vote, "may cause an unreasonable adverse effect(s) on the environment."[49] The Subcommittee may also suspend a pesticide registration "at any time" if it determines that the pesticide (1) does not comply with FIFRA, the MPCA, or its implementing regulations, (2) may cause unreasonable adverse effects on the environment, or (3) is an imminent hazard.[50] A pesticide is an "imminent hazard" if its continued use would result in "unreasonable adverse effects on the environment."[51]

1. Current Status of Anticoagulant Rodenticides Under the MPCA

As of March 26, 2024, the Subcommittee has registered 57 pesticide products containing FGARs and 71 pesticide products containing SGARs for use in Massachusetts.[52] All are classified for general use.[53]

In 2022, Massachusetts commercial pesticide applicators reported using over 559,000 lbs. of rodenticides, 96% of which (over 540,000 lbs.) were anticoagulant rodenticide products.[54] Bromadiolone, brodifacoum, and difethialone were the most applied anticoagulant rodenticides, in total amounts of 235,100, 165,053, and 129,470 lbs., respectively.[55] Notably, these statistics provided by the state do not include the volume of anticoagulant rodenticides applied by private individuals.

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restricted use pesticides may be further classified as "State Limited Use" when the Subcommittee determines access to the pesticide should be further restricted. 333 Code Mass. Regs. § 8.04(1)(b). Restricted use pesticides may only be applied by "an appropriately certified" private or commercial applicator or a "competent individual acting under the direct supervision of an appropriately certified applicator." G.L. c. 132B, § 7.

[45] G.L. c. 132B, § 7.

[46] *Id.*; 333 Code Mass. Regs. § 8.04.

[47] *See* 333 Code Mass. Regs. § 8.04(2) ("If the Subcommittee . . . classifies a pesticide or pesticide use different than the [EPA] classification, written notification shall be given to the applicant.").

[48] *Id.* § 8.05(2)(c).

[49] *Id.* § 8.03(1).

[50] G.L c. 132B, §7; 333 Code Mass. Regs. § 8.07(1).

[51] G.L. c. 132B, § 2.

[52] Ex. 13, Spreadsheet of Rodenticides Registered in Mass. (Mar. 26, 2024).

[53] *See* MDAR, *Massachusetts Pesticide Product Registration Information Database*, KELLY REGISTRATION SYS., https://www.kellysolutions.com/ma/pesticideindex.htm (last visited Feb. 18, 2024); *see also* MDAR, *Massachusetts State Restricted Use Products*, MASS.GOV, (Dec. 1, 2023) https://www.mass.gov/doc/state-restricted-use-products-srup/download.

[54] *See* Ex. 3, MDAR, *Annual Pesticide Use Information*, *supra*, note 6.

[55] *Id.*

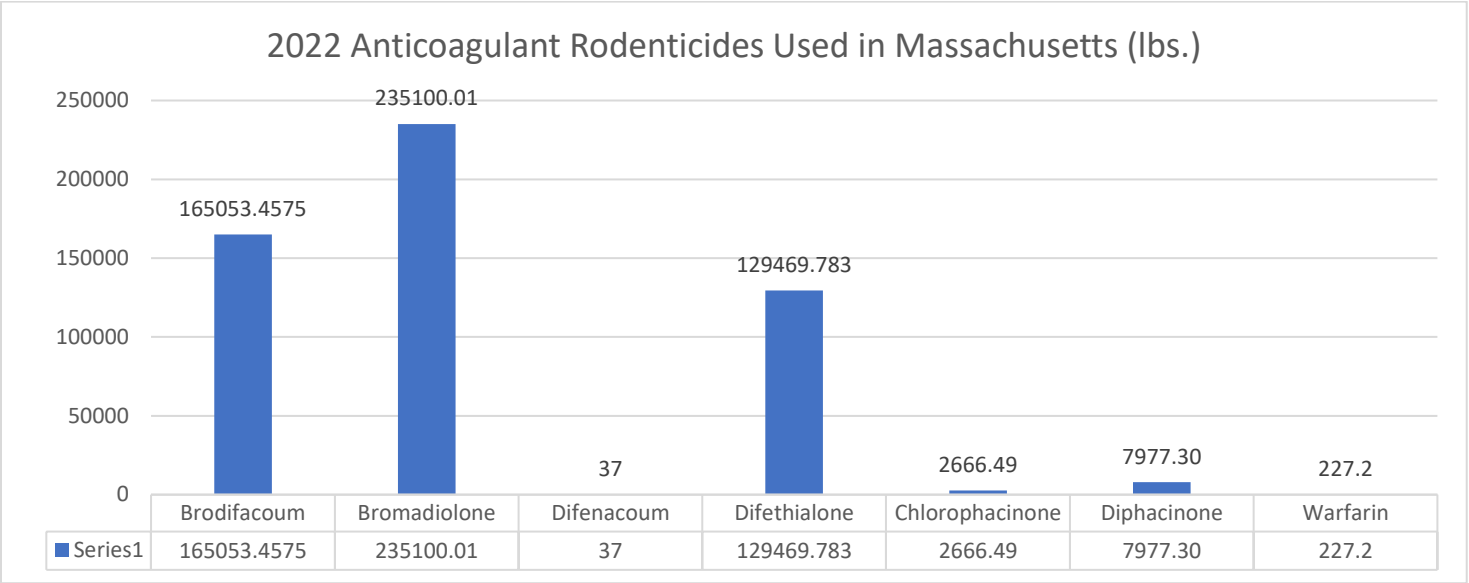

Figure 3. Quantity of anticoagulant rodenticides applied in Massachusetts in 2022, by active ingredient.
Source: MDAR, *Annual Pesticide Use Information*, *infra* note 54.

2. The "Unreasonable Adverse Effects on the Environment" Standard

Under the MPCA, "unreasonable adverse effects on the environment" means "[a]n unreasonable risk to man or the environment, taking into account the economic, social and environmental costs and benefits of the use of any pesticide."[56] The "environment" includes "water, air, land, and all plants and man and other living animals[57] therein, and the interrelationships which exist among these."[58]

There are no judicial opinions interpreting the MPCA's standard for registration. However, the Massachusetts Supreme Judicial Court has emphasized the importance of the Subcommittee's evaluation of each product under this standard, writing: "The Legislature has placed in the [S]ubcommittee the responsibility of determining on a Statewide basis, pesticide by pesticide, whether its use will cause unreasonable adverse effects to the environment."[59]

The phrase "unreasonable adverse effect(s) on the environment" is also the standard used for pesticide registration under FIFRA.[60] Because the MPCA was enacted in 1978 with the purpose of "conform[ing] the laws of the Commonwealth to [FIFRA], as amended, and the regulations promulgated thereunder,"[61] interpretations of the phrase under FIFRA provide clarity to its meaning under the MPCA.

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[56] 333 Code Mass. Regs. § 2.03(4).
[57] "Animal" includes "all vertebrate and invertebrate species, including but not limited to man and other mammals, birds, fish and shellfish." G.L c. 132B, § 2.
[58] G.L c. 132B, § 2.
[59] *Town of Wendell v. Att'y General*, 476 N.E.2d. 585, 592 (Mass. 1985).
[60] 7 U.S.C. §§ 136a(c)(5), 136(bb).
[61] G. L. c. 132B, § 1; 333 Code Mass. Regs. § 2.01.

According to EPA, "[t]he primary objective of FIFRA is to ensure that, when applied as instructed, pesticides will not generally cause unreasonable risk to human health or the environment."[62] This interpretation is consistent with FIFRA's legislative history and judicial opinions interpreting the statute.[63]

MDAR interprets "unreasonable adverse effects on the environment" as used in FIFRA Section 3(c)(5) as "creat[ing] a 'risk-benefit' standard that requires the agency to compare the potential risks from the use of a pesticide with the benefits to users of the pesticide."[64] Similarly, the U.S. Court of Appeals for the Ninth Circuit has described FIFRA registration as "a cost-benefit analysis to ensure that there is no unreasonable risk created for people or the environment from a pesticide."[65]

When EPA conducts this cost-benefit analysis, it "must base its risk evaluation on sufficient data and cannot rely on ambiguous or inconclusive studies to support a conclusion that a pesticide does not cause unreasonable adverse effects."[66] The risk EPA evaluates must be the "risk created by [the] actual use of the product," not merely the manner of use indicated on the product's label "where 'widespread and commonly recognized practice' differs from use as indicated on the label."[67] The risk of even "minor" or "moderate" adverse effects is "sufficient to invoke risk/benefit balancing under FIFRA."[68]

Cancellation of pesticide registration is warranted when EPA determines that a product "'generally' causes unreasonable adverse risk (though not necessarily actual effects) to man or the environment."[69] When the U.S. Court of Appeals for the Fifth Circuit evaluated an EPA determination that the adverse effects of a pesticide on birds violated FIFRA, it wrote: "FIFRA gives the Administrator sufficient discretion to determine that recurring bird kills, even if they do not significantly reduce bird population, are themselves an unreasonable environmental effect. Also, even if the Administrator were required to consider the effects of [pesticides] on bird population alone, he would be required to find only a risk to that population, not an actual reduction in it."[70]

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[62] *Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and Federal Facilities*, EPA, https://www.epa.gov/enforcement/federal-insecticide-fungicide-and-rodenticide-act-fifra-and-federal-facilities (last visited Mar. 4, 2024).

[63] *Bates v. Dow Agrosciences L.L.C.*, 544 U.S. 431, 437-438 (2005) (finding that the 1972 FIFRA amendment was "spurred by growing environmental and safety concerns" and "imposed a new criterion for [pesticide] registration--environmental safety").

[64] EPA, *Response from the Pesticide Re-evaluation Division to Comments on the Draft Risk Assessments and Benefits Assessments Supporting the Registration Review of Nitroguanidine-substituted Neonicotinoid Insecticides* 8 (Jan. 16, 2020), https://downloads.regulations.gov/EPA-HQ-OPP-2011-0581-0386/content.pdf, *reprinted in* MDAR, *Summary of EPA Registration Review of Neonicotinoids*, MASS.GOV, at App. C (Jan. 2021), https://www.mass.gov/doc/mdar-summary-of-epa-registration-review-of-neonicotinoids/download.

[65] *Pollinator Stewardship Council v. EPA*, 806 F.3d 520, 522–23 (9th Cir. 2015) (quoting *Washington Toxics Coal v. EPA*, 413 F.3d 1024, 1032 (9th Cir. 2005) (internal quotation marks omitted).

[66] *Pollinator Stewardship Council*, 806 F.3d at 531–32; *accord* Melissa Hoffer, Chief, Energy and Env't Bureau, Mass. Off. of the Att'y General, et al., Comment Letter on EPA's Risk Assessments and Benefits Assessments for the Registration Reviews of Imidacloprid, Clothianidin, Thiamethoxam, and Dinotefuran 4 (Apr. 20, 2018), https://www.regulations.gov/comment/EPA-HQ-OPP-2008-0844-1533.

[67] *Protexall Prods.*, 2 E.A.D. 854, 859 (E.P.A. App. July 26, 1989).

[68] *Id.* at 876–77.

[69] *Id.* at 859; *see Ciba-Geigy Corp. v. EPA*, 874 F.2d 277, 280 (5th Cir. 1989) ("The word ["generally"] requires the Administrator to determine that the use of a pesticide in a particular application creates unreasonable risks, though not necessarily actual adverse consequences, with considerable frequency.").

[70] *Ciba-Geigy Corp.*, 874 F.2d at 280.

The risks posed by a pesticide product to human health or the environment are "unreasonable" where they are not outweighed by the pesticide's benefits.[71] Consideration of a pesticide's benefits should take into account the efficacy and relative risk of available alternatives.[72]

If it appears that a pesticide may cause unreasonable adverse effects on the environment, the burden of proof is on the *registrant* to demonstrate that the benefits of continued use justify the risks.[73]

C. The Subcommittee is required to use all practicable means and measures to avoid or minimize damage to protected species when registering pesticides.

The Massachusetts Division of Fisheries and Wildlife ("MassWildlife") regulation 321 Code Mass. Regs. § 10.05, promulgated under the Massachusetts Endangered Species Act (MESA), requires all state agencies to (1) "utilize their authorities in furtherance of the purposes of MESA and 321 CMR 10.00," (2) review, evaluate, and determine the impact of their "activities" on listed species or their habitats, and (3) "use all practicable means and measures to avoid or minimize damage to such species or their habitats."[74] "Activities" means "any acts carried out by a state agency which could affect any state listed species or their habitat."[75]

Pesticide registration is therefore subject to regulation under 321 Code Mass. Regs. § 10.05(1) because MDAR, the Pesticide Board, and the Subcommittee are all "state agencies" and pesticide registration is an "activity" that "could affect" listed species and/or their habitats.[76]

Pesticide registration is also a "state action[]" for the purposes of MESA because it is an "activity" "directly undertaken by a state agency."[77] Although "state actions that do not require a permit under MESA, are not subject to review under MEPA, and do not involve actions on state-owned lands shall be presumed to be in compliance with 321 CMR 10.05," the Secretary of the Executive Office of Energy and Environmental Affairs (EEA) "may initiate a review" of a state action if she determines the action "may damage state listed species or their habitats."[78] Upon receiving notice from the EEA Secretary that such review is warranted, state agencies must consult with the National Heritage and Endangered Species Program (NHSEP).[79] Among other things, the relevant state agency must also submit evidence to the EEA Secretary and NHSEP demonstrating that "all practicable means and measures have been taken to avoid damage to state listed species and their habitats."[80]

Because pesticide registration constitutes a state action, if the EEA Secretary determines that the Subcommittee's registration of pesticide products containing FGARs or SGARs "may damage state listed species or their habitats," MDAR shall initiate consultation with NHSEP.[81]

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[71] *See id.*
[72] *Protexall Prods.*, 2 E.A.D. at 877.
[73] *See id.* at 854, 890 (finding that the chemical company did not satisfy its burden to show that the benefits of continued use of its pesticide product to control household ants justifies the risks).
[74] 321 Code Mass. Regs. § 10.05(1).
[75] *Id.*
[76] *See id.* § 10.02.
[77] *Id.* § 10.05(1).
[78] *Id.* § 10.05(2)(d).
[79] *Id.* § 10.05(2)(d)(1).
[80] *Id.* § 10.05(2)(d)(3).
[81] *Id.* § 10.05(2)(d)(1).

As this petition demonstrates, there is ample evidence that the Subcommittee's registration of anticoagulant rodenticides has damaged state-listed species and will continue to do so in the future. Petitioners are therefore submitting this evidence to the EEA Secretary and requesting that she initiate review in conjunction with filing this petition.

IV. There is overwhelming evidence that the continued use of anticoagulant rodenticides in Massachusetts will cause unreasonable adverse effects on the environment.

A. Background

Anticoagulant rodenticides are a subclass of chemicals used to kill rats, mice, and other rodents[82] by inhibiting their production of Vitamin K epoxide reductase, a liver enzyme used in the Vitamin K cycle.[83] The resulting lack of Vitamin K impairs the rodents' blood clotting mechanism, causing fatal hemorrhaging.[84]

There are two main categories of anticoagulant rodenticides: FGARs and SGARs. FGARs, including warfarin (and its sodium salt), chlorophacinone, and diphacinone (and its sodium salt), have been in use since the 1940s. Typically, rodents must consume FGARs on more than one occasion before being impacted by the poison's toxic effects.[85] Because rodents developed resistance to FGARs, SGARs—including brodifacoum, bromadiolone, difenacoum, and difethialone—were developed in the 1970s and 1980s.[86] SGARs are more potent and may be sufficient to kill rodents after just one feeding.[87] However, for both FGARs and SGARs, death does not occur for 5 to 7 days; this ensures that the rodents do not associate their symptoms with the bait (and therefore learn to avoid it), and also ensures that they continue feeding on the bait for several days.[88]

Although rodenticides are designed to be lethal to rodents, they are also toxic to nontarget animals.[89] To illustrate, the label for Contrac All-Weather Blox—which contains the SGAR bromadiolone, one of the most frequently used rodenticides in Massachusetts[90]— includes the following warning: "This product is extremely toxic to fish, birds and other wildlife. Dogs and predatory and scavenging mammals and birds might be poisoned if they feed upon animals that have eaten this bait."[91]

Nontarget domestic animals and wildlife are routinely sickened or killed by anticoagulant rodenticides through either direct (primary) or indirect (secondary) poisoning.[92] Instances of primary

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[82] Non-anticoagulant rodenticides include bromethalin, strychnine, cholecalciferol, and zinc phosphate.

[83] Ex. 14, EPA, *Potential Risks of Nine Rodenticides to Birds and Nontarget Mammals: a Comparative Approach* 2 (July 2004), https://www.regulations.gov/document/EPA-HQ-OPP-2006-0955-0005.

[84] *Id.*

[85] *Restrictions on Rodenticide Products*, *supra* note 2.

[86] Ex. 15, C.F. McGee et al., *Anticoagulant rodenticides and resistance development in rodent pest species – A comprehensive review,* 88 J. OF STORED PRODS. RSCH. (2020), https://doi.org/10.1016/j.jspr.2020.101688.

[87] *Id.*

[88] Ex. 16, EPA, *Draft Ecological Risk Assessment for the Registration Review of Seven Anticoagulant Rodenticides* 14 (Mar. 17, 2020), https://www.regulations.gov/document/EPA-HQ-OPP-2015-0778-0034.

[89] *See id.* at 4 ("The nature of risk to mammals and birds from ARs is well-established and includes mortality from primary and secondary exposure, as well as chronic growth and reproduction effects."); Ex. 14, *Potential Risks of Nine Rodenticides to Birds and Nontarget Mammals*, *supra* note 83, at 107.

[90] *See* MDAR, *Annual Pesticide Use Information*, *supra* note 54.

[91] Ex. 17, Letter from Gene Benbow, Product Manager, EPA Office of Pesticide Program to Jennifer Klika, Regulatory Affairs Manager, Bell Laboratories, Inc. app (Contrac All-Weather Blox Approved Labeling) 3 (Feb. 13, 2020), https://www3.epa.gov/pesticides/chem_search/ppls/012455-00079-20200213.pdf.

[92] Mass. Div. of Fisheries & Wildlife, *Wildlife and rodenticide*, *supra* note 1.

poisoning occur when a nontarget animal—for example, squirrels[93]—eats bait containing FGARs or SGARs. Secondary poisoning occurs when a predator or scavenger species eats prey that has consumed the poisoned bait. Secondary poisoning has been documented in numerous birds of prey and predatory mammals like foxes, fishers, and coyotes.[94] Such secondary poisonings are incident to the poison's delayed-action mechanism, which guarantees poisoned rodents remain alive long enough to transfer the poison up the food chain. Therefore, secondary poisonings are not reduced by mitigation mechanisms like tamper-proof bait boxes and can only be addressed by banning or reducing the usage of anticoagulant rodenticides themselves.

Anticoagulant rodenticides bioaccumulate in animals who eat large quantities of prey who have consumed these chemicals.[95] Because anticoagulant rodenticides take several days to kill rodents, and affected rodents may be lethargic or less able to flee from predators, there is a significant risk of bioaccumulation in nontarget predator species.[96] As a result, anticoagulant rodenticide poisoning is "frequent" in raptors, even though bird species are thought to be more tolerant of anticoagulants than mammals.[97] Over 2,000 incidents of anticoagulant rodenticide poisoning in wildlife were reported to the EPA between 1971 and 2023,[98] though EPA has admitted that "*very few* of the total incidents that occur are actually observed or reported to regulatory agencies."[99] EPA believes that wildlife exposure incidents have continued to occur at increasing rates since 2010, despite certain restrictions implemented in 2008 designed to limit environmental impacts (detailed in Part IV.F.1 below).[100] The increase in incidents "is largely driven by two rodenticides in particular – brodifacoum and bromadiolone," which accounted for 557 reported incidents between 2010 and 2018.[101] "Overall, it appears that SGARs rather than FGARs are the drivers of secondary poisoning in wildlife, however diphacinone appears to rank with the SGARs (122 incidents). Of 656 total applicable bird incidents [reported to EPA] since 1971, SGARs were involved in 90% and FGARs in 10%. Of 607 total incidents involving mammals [reported] since 1971, 78% were due to SGARs and 22% to FGARS."[102]

Signs of anticoagulant rodenticide poisoning in birds and mammals may include spontaneous internal or external bleeding, widespread bruising, blood in the urine or feces, cardiovascular shock, or death.[103] Secondary poisoning may also interfere with the immune functions of mammals.[104]

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[93] Ex. 18, Jennifer Taylor, Animal Care Coordinator, *Rodenticide: Some Squirrels Survived*, WILD CARE OF CAPE COD, https://www.wildcarecapecod.org/rodenticide-some-squirrels-survived/ (last visited Mar. 6, 2024).

[94] Mass. Div. of Fisheries & Wildlife, *Wildlife and rodenticide*, *supra* note 1.

[95] *Id.*; Ex. 16, *Draft Ecological Risk Assessment for the Registration Review of Seven Anticoagulant Rodenticides*, *supra* note 88, at 8 ("Persist[e]nce of [anticoagulant rodenticide] residues in the bodies of primary consumers is often sufficient to cause death in secondary consumers.").

[96] Ex. 14, *Potential Risks of Nine Rodenticides to Birds and Nontarget Mammals*, *supra* note 83, at 1.

[97] Ex. 19, Shouta M. M. Nakayama et al., *Avian interspecific differences in VKOR activity and inhibition: Insights from amino acid sequence and mRNA expression ratio of VKORC1 and VKORC1L1*, 228 COMPAR. BIOCHEMISTRY & PHYSIOLOGY 108635, 108638 (Feb. 2020).

[98] Ex. 12, EPA, *Rodenticides: Draft Biological Evaluation, supra* note 38, at 42.

[99] Ex. 16, *Draft Ecological Risk Assessment for the Registration Review of Seven Anticoagulant Rodenticides*, *supra* note 88, at 27–28 (emphasis added).

[100] *Id.*

[101] *Id.* at 27.

[102] Ex. 12, EPA, *Rodenticides: Draft Biological Evaluation, supra* note 38, at 42. EPA counted incidents with multiple anticoagulant rodenticide residues separately for each rodenticide.

[103] Ex. 20, NYS Wildlife Health Program, *Rodenticide Toxicity*, CORNELL WILDLIFE HEALTH LAB (2018), https://cwhl.vet.cornell.edu/system/files/public/cwhl-fact-sheetsrodenticide.pdf.

[104] *Protecting Wildlife from Harmful Poisons (California)*, ANIMAL LEGAL DEF. FUND, https://aldf.org/project/california-ecosystems-protection-act/ (last visited Mar. 26, 2024).

Humans are also at risk of anticoagulant rodenticide poisoning.[105] In particular, children may mistake brightly colored baits for candy or food, thus becoming exposed to anticoagulant rodenticides through direct oral ingestion.[106] Ingesting anticoagulant rodenticides can have significant consequences for human health, including death.[107] Non-lethal symptoms of anticoagulant rodenticide poisoning include vomiting blood, bruising, bloody urine, confusion, lethargy, and damage to the heart or other vital organs.[108] In some cases, complete recovery may be impossible.[109]

B. Anticoagulant rodenticides sicken and kill protected species, which is an unreasonable adverse effect on the environment.

Anticoagulant rodenticides have been responsible for injuring and killing species protected under state and federal law. The MPCA defines "unreasonable adverse effects on the environment" as "[a]n unreasonable risk to man or the environment, taking into account the economic, social and environmental costs and benefits of the use of any pesticide."[110] As discussed below, allowing anticoagulant rodenticides to kill protected species is unreasonable because it undermines longstanding conservation efforts, jeopardizes ecosystem health, and deprives society of the cultural and economic benefits those species provide.

1. The Subcommittee's pesticide registration decisions may not "take" species protected under MESA.

MESA[111] provides that "no person may take . . . any animal species listed as endangered, threatened or of special concern or listed under the Federal Endangered Species Act" without a permit.[112] To "take" means "to harass, *harm*, pursue, hunt, shoot, hound, *kill*, trap, capture, collect, process, *disrupt the nesting, breeding, feeding or migratory activity* or attempt to engage in any such conduct, or to *assist such conduct*."[113] The Subcommittee is required to use its authority "in furtherance of the purposes of MESA,"[114] which is "to conserve plant and animal species within the Commonwealth and to protect their habitats."[115]

MDAR, the Pesticide Board, and the Subcommittee fall under the MESA definition of "person[,]" which includes "any officer, agent, department or instrumentality of the federal government or any state or its political subdivisions."[116] Thus, MESA prohibits the Subcommittee from taking actions

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[105] *See* Ex. 21, E. Martin Caravati et al.., *Long-acting anticoagulant rodenticide poisoning: An evidence-based consensus guideline for out-of-hospital management*, 45 Clinical Toxicology 1 (2007), https://doi.org/10.1080/15563650600795487.
[106] Jennifer Peaslee & Beth Bunting, *Of Mice and Wildlife – Rodent Roulette*, CORNELL WILDLIFE HEALTH LAB (Feb. 23, 2018), https://cwhl.vet.cornell.edu/article/mice-and-wildlife-%E2%80%93-rodent-roulette.
[107] *See Anticoagulant rodenticides poisoning*, MOUNT SINAI, https://www.mountsinai.org/health-library/poison/anticoagulant-rodenticides-poisoning (last visited Feb. 18, 2024).
[108] *Id.*
[109] *Id.*
[110] G.L. c. 132B, § 2.
[111] G.L. c. 131A, §§ 1–7.
[112] G.L. c. 131A, §§ 2, 3.
[113] G.L. c. 131A, § 1; 321 Code Mass. Regs. § 10.02 (emphasis added).
[114] 321 Code Mass. Regs. § 10.05(1).
[115] *Pepin v. Div. of Fisheries & Wildlife*, 4 N.E.3d 875, 880 (Mass. 2014).
[116] G.L. c. 131A, § 1.

that will harm, kill, or disrupt the feeding activity of animal species listed as Endangered, Threatened or of Special Concern[117] under MESA or the federal Endangered Species Act without a permit.[118]

2. Anticoagulant rodenticides registered by the Subcommittee "take" bald eagles protected by MESA.

At least four American bald eagles—which are protected as species of "Special Concern" under MESA[119]—have died (and therefore been "taken")[120] by anticoagulant rodenticide poisoning in Massachusetts.[121]

On March 1, 2023, beloved bald eagle MK succumbed to what veterinarians believed was SGAR poisoning after fighting for her life for 36 hours.[122] MK was born in Waltham and had been nesting with her mate, KZ, along the Mystic Lakes Watershed since 2016. As the first bald eagles to nest in the area in decades, MK and KZ were adored by the local community and even inspired a 2021 children's book chronicling their remarkable journey.[123] However, on February 27, 2023, observers at Mt. Pleasant Cemetery in Arlington noticed MK was "drooping her head and spending a lot of time on the ground" instead of in trees.[124] Thanks to public concern, wildlife rescuers—including Petitioners Amato, Joyce, and Sears-Joyce—were able to capture MK and transport her to Cape Wildlife Center for treatment.[125] Unfortunately, however, the rehabilitators were unable to save MK from death by internal hemorrhaging only hours later.[126]

Shortly after MK's passing, hundreds of Massachusetts citizens organized by Save Arlington Wildlife rallied together at Arlington Town Hall to mourn the eagle and push lawmakers to further restrict

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[117] *See* 321 Code Mass. Regs. § 10.90.

[118] *See Strahan v. Coxe*, 127 F.3d 155 (1st Cir. 1997) (finding two Massachusetts state agencies liable for "takes" because of a licensing scheme that allowed fishermen to use lobster pots and gill nets that harmed right whales); *Defs. of Wildlife v. EPA*, 882 F.2d 1294 (8th Cir. 1989) (EPA effected "take" of listed species by third parties through strychnine poison registration scheme that, but for the registration, would not have allowed strychnine to be used by the third parties); *Sierra Club v. Yeutter*, 926 F.2d 429 (5th Cir. 1991) (the U.S. Forest Service was liable for "taking" a listed species of woodpecker due to its even-aged silvicultural practices); *Loggerhead Turtle v. County Council of Volusia County, Fla.*, 148 F.3d 1231 (11th Cir. 1998) (upholding lower court finding that a county was liable for "taking" listed turtles via a beach driving permitting scheme).

[119] 321 Code Mass. Regs. § 10.90(4) (listing MESA-protected species).

[120] *See id.* § 10.02 (defining "take").

[121] *See* Ex. 22, Mass. Div. of Fisheries & Wildlife, *First Bald Eagle Death in Massachusetts from Rodenticides Confirmed*, MASS.GOV (May 2, 2021), https://www.mass.gov/news/first-bald-eagle-death-in-massachusetts-from-rodenticides-confirmed; Ex. 23, Mass. Div. of Fisheries & Wildlife, *Eaglet Dies from Rodenticide Poisoning*, MASS.GOV (Aug. 11, 2021), https://www.mass.gov/news/eaglet-dies-from-rodenticide-poisoning; *A Campaign to Rescue Raptors*, MASS AUDUBON, https://www.massaudubon.org/take-action/advocate/rescue-raptors (last visited Mar. 26, 2024) ("But just two years later, after eating multiple rodents poisoned with SGARs, MK passed away. Since 2021, at least three other bald eagles in Massachusetts have died from SGAR poisoning.").

[122] Ex. 24, Mike Sullivan, *Bald Eagle Believed to Have Ingested Rodenticide in Arlington Dies*, CBS NEWS (Mar. 2, 2023), https://www.cbsnews.com/boston/news/bald-eagle-poisoned-rat-dies-arlington-massachusetts-mk/.

[123] John Harrison & Kim Nagy, *KZ & MK, Lord and Lady of the Lakes: A True Story of the Mystic Lakes Bald Eagles*, ZIGGY OWL PRESS (Mar. 11, 2021).

[124] Ex. 25, Mary Saladna, *Call for Action in Massachusetts After Bald Eagle Dies from Pro-Grade Rat Poison*, WCVB (Mar. 2, 2023), https://www.wcvb.com/article/arlington-massachusetts-protest-of-bald-eagle-death/43170973.

[125] *Id.*

[126] Ex. 26, *Bald Eagle Rescued from Massachusetts Cemetery After Ingesting Rat Poison Dies, Cape Wildlife Center Says*, WCVB (updated Mar. 2, 2023, 5:22 AM), https://www.wcvb.com/article/bald-eagle-dies-rat-poison-at-massachusetts-cemetery/43144811.

the use of SGARs.[127] Since then, and in part due to the public's outrage over losing MK, Arlington and other Massachusetts localities have moved to ban SGARs, as discussed below in Part IV.F.2.

Figure 3. Petitioner Amato is pictured holding MK on February 27, 2023, in preparation for her transport to Cape Wildlife Center. **Source**: Stephen Setzer.

While the devastating loss of MK may have garnered the most media attention, she is not the first bald eagle Massachusetts has lost in recent years. MassWildlife has confirmed that two bald eagles found—including MK's daughter, 25C—had died due to anticoagulant rodenticide poisoning in 2021:

- **March 2021**: Observers noticed an adult female eagle exhibiting unusual behavior along the Charles River. Within a day, the eagle died in her nest. MassWildlife officials retrieved the eagle and transported her to Tufts Wildlife Clinic where a necropsy was performed. Toxicology testing of the eagle's liver confirmed that her cause of death was lethal levels of anticoagulant rodenticides.[128]
- **July 2021**: A distressed female fledgling eaglet named 25C was found on the ground in Middlesex County and brought by rescuers to Tufts Wildlife Clinic for admission. The young bird passed away upon her arrival at the clinic. A necropsy was conducted and 25C's liver tissue was sent to a laboratory for toxicology analysis. Both the necropsy and the

[127] Ex. 27, Eli Curwin, *Rat Poison is Believed to Have Caused a Local Bald Eagle's Death*, BOSTON.COM (Mar. 3, 2023), https://www.boston.com/news/environment/2023/03/03/rat-poison-bald-eagles-death-hundreds-calling-for-ban/; Ex. 25, Saladna, *Call for Action in* Massachusetts, *supra* note 124.

[128] Ex. 22, Mass. Div. of Fisheries & Wildlife, *First Bald Eagle Death in Massachusetts from Rodenticides*, *supra* note 121.

toxicology tests confirmed that the eaglet's death resulted from ingesting deadly levels of anticoagulant rodenticides.[129]

Additionally, in 2018, Cape Wildlife Center had to euthanize a male bald eagle whose excessive bleeding and delayed blood clotting time suggested he was suffering from anticoagulant rodenticide poisoning.[130] The eagle was found injured with a puncture wound and a ruptured eye, but Cape Wildlife Center staff believed "the most significant factor in his prognosis" was rodenticide toxicity, likely due to ingesting a rat or mouse that had consumed anticoagulant rodenticides.[131] Typically, a healthy bird's blood would clot in two to four minutes; however, this eagle's blood failed to clot after over eight minutes.[132] Due to the severity of his injuries, MassWildlife directed Cape Wildlife Center to humanely euthanize the bird.[133]

The harm inflicted by anticoagulant rodenticides on bald eagles is an unreasonable adverse effect on the environment. Eagles play a vital role in maintaining healthy ecosystems by regulating prey populations.[134] By disrupting this balance through the indiscriminate killing of eagles, FGARs and SGARs degrade the ecosystem's natural ability to control pest populations. Given that anticoagulant rodenticides are used for their rodent control "benefits," the fact that these chemicals are undermining the ecologically sound rodent control provided by raptors demonstrates the unreasonableness of their environmental impact.[135]

Furthermore, the use of anticoagulant rodenticides has undermined the long-standing conservation efforts[136] that have allowed bald eagle populations to rebound to the point of returning to eastern Massachusetts for the first time in decades.[137] The recent deaths of bald eagles in Massachusetts, including the highly publicized case of MK and her family, are only indicative of the larger threat to

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[129] Ex. 23, Mass. Div. of Fisheries & Wildlife, *Eaglet Dies from Rodenticide Poisoning*, *supra* note 104; *see* Ex. 28, Ariella Weiss, *Rodenticide threatens local birds of prey*, THE JUSTICE (Mar. 21, 2023), https://www.thejustice.org/article/2023/03/rodenticide-threatens-local-birds-of-prey.

[130] Ex. 5, Cape Wildlife Center, FACEBOOK (Oct. 31, 2018, 10:23 AM), https://www.facebook.com/CapeWildlife/posts/1171105379707643?ref=embed_post ("While this eagle had severe injuries, suspected [anticoagulant] rodenticide poisoning likely led to his fatal prognosis."); Ex. 29, Jason Savio, *Bald Eagle Dies After Rat Poisoning*, CAPE COD TIMES (Nov. 2, 2018, 7:11 PM), https://www.capecodtimes.com/story/news/2018/11/02/bald-eagle-dies-after-rat/6554445007/.

[131] Ex. 29, Savio, *supra* note 130.

[132] *Id.*

[133] *Id.*

[134] *See* Amy Young, *Raptors and Rodenticides*, ANIMAL HEALTH TOPICS (Jan. 5, 2022), https://healthtopics.vetmed.ucdavis.edu/health-topics/raptors-and-rodenticides ("[Raptors] are efficient rodent-controlling predators that maintain ecological balance by keeping prey populations in check. Reports indicate that a single family of barn owls can eat 1,000 – 3,000 rodents . . . each year."); Scott Cotton, Univ. of Wyoming Extension, *Raptors Help Control Rodents, Snakes In Landscape*, BARNYARDS & BACKYARDS 16 (Fall 2018), https://www.uwyo.edu/barnbackyard/_files/documents/magazine/2018/fall/0918raptors.pdf.

[135] Furthermore, it is unclear whether these rodent control "benefits" have manifested. Despite the substantial volume of rodenticides applied, anecdotal reports suggest that Bostonians believe "rat infestations are on the rise." *See* Katelyn Umholtz, *2 Local Redditors Said Rats Entered Their Toilets From Below*, BOSTON.COM (Jan. 31, 2024), https://www.boston.com/news/local-news/2024/01/31/rats-boston-in-toilets/.

[136] *See Bald Eagle*, U.S. Fish & Wildlife Serv., https://www.fws.gov/species/bald-eagle-haliaeetus-leucocephalus (last visited Mar. 27, 2024) ("The recovery of the bald eagle is one of the most well-known conservation success stories of all time.").

[137] *See A Campaign to Rescue Raptors*, *supra* note 121 ("When MK and her partner nested in Arlington in 2021, they were the first Bald Eagles to nest in the town in over 50 years.").

eagles posed by anticoagulant rodenticides. A national study published in 2021 found that anticoagulant rodenticides were present in 82% of the 124 bald and golden eagles examined.[138]

The public's response to MK's story[139] also demonstrates the extremely high social costs of permitting anticoagulant rodenticides to kill protected species.[140] Many people derive enjoyment and inspiration from observing and interacting with protected species, whether through birdwatching, ecotourism, or educational programs.[141] Additionally, many protected species—including the bald eagle, the national bird of the US[142]—have cultural value for individuals and society at large.[143]

As discussed in Part III.C above, the impact of the Subcommittee's registration decision on protected species like the bald eagle also warrants consultation with the NHSEP.[144] As such, petitioners have requested that the EEA Secretary notify the Subcommittee that consultation is warranted.[145]

Figure 4. Concerned citizens marched in Arlington to protest the town's use of SGARs following MK's death. **Source**: Ex. 25, Saladna, *Call for Action in Massachusetts*, *supra* note 124.

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[138] Ex. 30, Kevin D. Niedringhaus et al., *Anticoagulant Rodenticide Exposure and Toxicosis in Bald Eagles (*Haliaeetus leucocephalus*) and Golden Eagles (*Aquila chrysaetos*) in the United States*, 16 PLOS ONE 1 (Apr. 7, 2021), https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0246134.

[139] *See, e.g.,* Ex. 31, Elizabeth Preston, *In Remembrance of MK*, ORION https://orionmagazine.org/article/mk-eagle-arlington-massachusetts-killed-2023/ (last visited Mar. 26, 2024).

[140] *See* 333 Code Mass. Regs. § 2.03(4) (defining "unreasonable adverse effects on the environment" to include "[a]n unreasonable risk to man or the environment, taking into account the economic, *social* and environmental costs and benefits of the use of any pesticide" (emphasis added)).

[141] *See* Frank J. Mazzotti, Specialist, Univ. of Florida, *The Value of Endangered Species: The Importance of Conserving Biological Diversity*, UF/IFAS EXTENSION (Aug. 31, 2017), https://edis.ifas.ufl.edu/publication/UW064.

[142] Caroline Stillitano, *The Significance of Bald Eagles in the United* States, ONENATURE INSTITUTE (Apr. 6, 2022), https://onenatureinstitute.org/stories/the-significance-of-bald-eagles-in-the-united-states/.

[143] *See* Mazzotti, *supra* note 141; *Why it's Critical to Protect Wildlife and Endangered Species*, GVI PLANET (Apr. 1, 2023), https://www.gviusa.com/blog/smb-why-its-critical-to-protect-wildlife-and-endangered-species/.

[144] 321 Code Mass. Regs. § 10.05(2)(d).

[145] It is unclear whether MESA consultation has already occurred. If it has, the new information presented in this petition detailing the devastating impacts of anticoagulant rodenticides on protected species demonstrates that a new consultation is warranted.

3. Anticoagulant rodenticides also cause violations of the federal Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

In addition to their impacts on bald eagles, anticoagulant rodenticides also injure and kill other raptor populations in Massachusetts. Many such birds of prey, including bald eagles, red-tailed hawks, barred owls, eastern screech owls, and great horned owls, are federally protected by the Migratory Bird Treaty Act (MBTA),[146] which prohibits the wounding and killing of migratory birds.[147] Bald eagles are also protected under the Bald and Golden Eagle Protection Act (BGEPA), which imposes similar prohibitions.[148] That anticoagulant rodenticides regularly inflict the harms federal conservation statutes seek to prevent further demonstrates their unreasonable adverse effects on the environment.

For example, in late April 2024, wildlife photographers in Framingham found a great horned owl dead at the base of the tree where she nested.[149] Rescuers found one of her owlets dead in the nest with blood in his nostrils and mouth, while a second owlet brought to Cape Ann Wildlife passed away while undergoing treatment for suspected anticoagulant rodenticide poisoning.[150] A necropsy of the mother and owlets confirmed widespread hemorrhaging caused by anticoagulant rodenticide toxicity.[151]

Figure 5. A mother great horned owl and her owlets died of suspected anticoagulant rodenticide poisoning, April 2024. **Source**: Cape Ann Wildlife

[146] *See* 50 C.F.R. § 10.13(c)(1) (listing species protected by the MBTA).
[147] 16 U.S.C. §§ 703, 704; 50 C.F.R. § 10.12.
[148] *See* 16 U.S.C. § 668(a); 50 C.F.R. 22.6.
[149] Ex. 39, Framingham Great Horned Owl Necropsy Report and Photos (Apr. 24, 2024).
[150] *Id.*; Personal communication with Erin Hutchings, Cape Ann Wildlife (Apr. 29, 2024).
[151] All three birds had brodifacoum and difethialone in their livers. Ex. 39, Framingham Great Horned Owl Necropsy Report and Photos (Apr. 24, 2024).

In addition to these deaths, four great horned owls died of rodenticide poisoning in Arlington in 2022,[152] and a disoriented barred owl exhibiting signs of anticoagulant rodenticide poisoning was rescued at Faneuil Hall in Boston in February 2023.[153] Though he recovered in the care of Petitioner Hutchings, the owl lost an eye due to the poisoning.[154] Like bald eagles, hawks, and other raptors, owl species are at heightened risk of anticoagulant rodenticide poisoning due to their extensive reliance on rodents as a food source.[155]

The MBTA, 16 U.S.C. § 703, is a sweeping federal statute that makes it a criminal offense "at any time, by any means or in any manner, to pursue, hunt, take, capture, [or] kill" any migratory bird without a permit.[156] "Take" means "to pursue, hunt, shoot, wound, kill, trap, capture, or collect" migratory birds.[157] The U.S. Fish and Wildlife Service (FWS) and many courts have interpreted this phrase to include the inadvertent "take" of protected birds incidental to otherwise lawful activities.[158] Thus, the unintended death of a protected bird caused by rodenticide poisoning likely constitutes a violation of the MBTA.

The BGEPA also makes it a criminal offense for any person—including state agencies—to "knowingly, or with wanton disregard for the consequences of his act take, . . . at any time or in any manner any bald eagle."[159] "Take" means to "pursue, shoot, shoot at, *poison*, wound, kill, capture, trap, collect, destroy, molest, or disturb."[160] FWS authorizes incidental take of eagles only under certain circumstances, and criteria for evaluating whether to issue a permit include whether the take "is compatible with the preservation of the bald eagle and the golden eagle," whether it "results from, but is not the purpose of, the activity," whether it "[i]s necessary to protect a legitimate

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[152] *See* Laura Kiesel & Marci Cemenska, *Rat Poison Linked to Owl's Death: Take Poison-Free Pledge*, YOURARLINGTON (Jan. 12, 2023), https://www.yourarlington.com/component/easyblog/entry/15-environment/3203-poison-121922.html?Itemid=406164.

[153] Ex. 32, Shaun Chaiyabhat, *Poisoned Owl Rescued at Boston's Faneuil Hall After Several Attempts*, WCVB5 (Feb. 21, 2023), https://www.wcvb.com/article/poisoned-owl-rescued-faneuil-hall-boston/43015651.

[154] Ex. 33, Melissa Ellin, *'Owen' the Faneuil Hall Owl is a Free Bird Again*, BOSTON.COM (April 3, 2023), https://www.boston.com/news/local-news/2023/04/03/owen-owl-faneuil-hall-released-rodenticide-poisoning/.

[155] *See* Ex. 34, Angela Nelson, *Understanding the Risks of Rodent Poisons to Birds of Prey*, TUFTS NOW (Sept. 16, 2020), https://now.tufts.edu/2020/09/16/understanding-risks-rodent-poisons-birds-prey; *see also* Ex. 35, Mourad W. Gabriel et al., *Exposure to Rodenticides in Northern Spotted and Barred Owls on Remote Forest Lands in Northwestern California: Evidence of Food Web Contamination*, AVIAN CONSERVATION & ECOLOGY (2018), https://doi.org/10.5751/ACE-01134-130102 (study led by U.C. Davis finding that 70% of northern spotted owls and 40% of barred owls collected were exposed to were exposed to one or more anticoagulant rodenticides); Ex. 36, Terra R. Kelly et al., *Causes of Mortality and Unintentional Poisoning in Predatory and Scavenging Birds in California*, VET. REC. OPEN (2013), https://doi.org/10.1136/vropen-2014-000028 (detecting anticoagulant rodenticide residues in 84% of golden eagles, turkey vultures, and ravens tested in California from 2007-2009).

[156] 16 U.S.C. §§ 703, 704; *see* 50 C.F.R. § 10.13(c)(1) (listing species protected by the MBTA).

[157] 50 C.F.R. § 10.12.

[158] *See* FWS Director's Order No. 225, Incidental Take of Migratory Birds (Oct. 5, 2021), https://www.fws.gov/guidance/sites/guidance/files/documents/do225.pdf ("The U.S. Fish and Wildlife Service (Service) interprets the Migratory Bird Treaty Act (MBTA) to prohibit incidental take of migratory birds and will enforce the statute accordingly."); Ex. 37, Cong. Rsch. Serv., *Migratory Bird Treaty Act (MBTA): Selected Legal Issues* (Jan. 25, 2022), https://crsreports.congress.gov/product/pdf/R/R44694/5; *United States v. FMC Corp.*, 572 F.2d 902, 908 (2d Cir. 1978) (finding that storing chemicals dangerous to protected birds in an open pond they could access constituted a "take" under the MBTA); *Natural Res. Def. Council* v. *U.S. Dep't of the Interior,* 478 F. Supp. 3d 469 (S.D.N.Y. 2020).

[159] 16 U.S.C. § 668(a); 50 C.F.R. § 22.6.

[160] 50 C.F.R. § 22.6 (emphasis added).

interest in a particular locality, and whether it "cannot practicably be avoided."[161] Permit conditions may require mitigation measures and monitoring of eagle take.[162] It is unknown whether MDAR has obtained an incidental take permit for the rodenticide poisonings of eagles.

Anticoagulant rodenticides are known to wound and kill federally protected birds of prey in Massachusetts.[163] In a study of 94 birds of prey admitted to the Tufts Wildlife Clinic at Cummings School of Veterinary Medicine at between 2012 and 2016 (including red-tailed hawks, barred owls, eastern screech owls, and great horned owls), 96% of birds tested positive for SGARs.[164] In a follow-up study, 100% of the 43 red-tailed hawks admitted to the clinic between 2017 and 2019 tested positive for anticoagulant rodenticides.[165] Notably, 91% of these birds tested positive for two or more anticoagulant rodenticides.[166] The most frequent culprits were brodifacoum, bromadiolone, and difethialone.[167] Fourteen of the birds, approximately one third of those studied, died from anticoagulant rodenticide toxicosis.[168] Such studies illustrate that anticoagulant rodenticides are causing repeated violations of the MBTA and the BGEPA in Massachusetts. In addition to such deaths, anticoagulant rodenticides have also been shown to injure birds in sublethal ways, causing hemorrhaging, weakness, lethargy, and bloody diarrhea.[169] In this manner, these poisons further engender violations of federal law by wounding numerous birds exposed to them.

In 2020, EPA confirmed in its *Draft Ecological Risk Assessment for the Registration Review of Seven Anticoagulant Rodenticides* that protected species continue to be exposed to and harmed by anticoagulant rodenticides, citing the original Tufts Wildlife Clinic study of anticoagulant rodenticide toxicosis in red-tailed hawks, barred owls, Eastern screech owls, and great horned owls in Massachusetts.[170]

While the signs of anticoagulant rodenticide poisoning—such as blood that is slow to clot—are readily apparent to wildlife rehabilitators, poisoning can only be confirmed through costly necropsies or liver analyses after an animal dies. From late 2022 through May 9, 2024, Cape Ann Wildlife has been able to fund liver toxicology analyses (and some necropsies) by the Kansas State University (KSU) Veterinary Diagnostic Laboratory of 46 deceased patients—including Cooper's hawks, screech owls, great horned owls, barred owls, red-tailed hawks, crows, a raven, a coyote pup, and red foxes—who were all suspected cases of anticoagulant rodenticide poisoning in Massachusetts.[171] SGARs were present in 100% of the samples provided; FGARs were present in 30% of samples provided from hawks and 27% of samples provided from owls.[172]

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[161] *Id.* § 22.200(d). The issuance criteria stated above are applicable to the issuance of "specific permits" for incidental take. Although the regulations also provide for "general permits", such permits are only available for certain listed activities, namely wind energy projects, power lines, disturbance, and take of eagle nests. *See id.* §§ 22.210, 22.250–300.
[162] *Id.* § 22.220.
[163] *See* discussion *supra* § IV.B.2–3.
[164] Ex. 1, Murray, *Anticoagulant Rodenticide Exposure and Toxicosis*, *supra* note 5, at 1041.
[165] Ex. 38, Maureen Murray, *Continued Anticoagulant Rodenticide Exposure of Red-tailed Hawks (*Buteo jamaicensis*) in the Northeastern United States with an Evaluation of Serum for Biomonitoring*, 39 ENVT'L TOXICOLOGY & CHEMISTRY 2325, 2327 (2020).
[166] *Id.*
[167] *Id.* at 2329.
[168] *Id.* at 2327.
[169] Ex. 16, *Draft Ecological Risk Assessment for the Registration Review of Seven Anticoagulant Rodenticides*, *supra* note 88, at 20.
[170] *Id.* at 68.
[171] Ex. 39, James Joyce II, Summary of KSU Anticoagulant Test Result Data from Cape Ann Wildlife (May 7, 2024).
[172] *Id.*

The following is only sampling of Massachusetts incidents involving MBTA protected species[173]:

Species	Incident Date; Location	Incident Description
Red-tailed Hawk	Found 2024-02-16 Salem, MA	Salem Wildlife Rescue brought a sick red-tailed hawk to Cape Ann Wildlife. He was bleeding watery, non-clotting blood from a minor wound and died hours later.[174] A necropsy from KSU confirmed that the hawk died of diffuse, severe internal bleeding and had brodifacoum and difethialone in his liver.[175]
	Sample received 2024-02-08 Medford, MA	After receiving treatment for 6 hours at Cape Ann Wildlife, a red-tailed hawk passed away from anticoagulant rodenticide poisoning. The hawk was found in an area of Medford that has "high use of [SGAR] boxes." The hawk was sent to KSU for a full necropsy after blood rehabbers noticed blood fluid seeping out of the hawk's mouth postmortem. KSU detected both brodifacoum and difethialone in the hawk's liver as well as substantial hemorrhage within the bird's body cavities and organs.[176]
	Sample received 2024-01-02 Wakefield, MA	A red-tailed hawk was found suffering unclotted bleeding from the mouth and nose. Rescuers transported the hawk to Cape Ann Wildlife where the hawk passed within 3 hours of intake. The hawk's necropsy results confirm cause of death as anticoagulant rodenticide toxicity (brodifacoum and difethialone).[177]
	Found 2023-11-25; Died 2023-12-2 Somerville, MA	"Hawk girl," a raptor in Somerville died of severe anemia and uncontrolled bleeding. Hawk Girl was found perched on a chain link fence, appearing listless and unmoving for many hours. By the time she was brought to Petitioner Hutchings for care, she was lying on her belly with eyes partially closed. Her tongue and mouth were nearly white, and there was internal bleeding visible on the underside of the reported injured left wing and other body locations. Despite placing Hawk Girl in a supportive oxygen chamber and administering round-the-clock Vitamin K, Hawk Girl passed away a week later.[178] An anticoagulant panel showed that her liver contained brodifacoum and difethialone.[179]

[173] *See* 50 C.F.R. § 10.13(c) (listing species protected by the MBTA).
[174] Ex. 5, Cape Ann Wildlife, Inc., FACEBOOK (Feb. 16, 2024, 03:27 PM), https://www.facebook.com/CapeAnnWildlifeInc/posts/pfbid0GuQZaYJf3mzUtPnHoH36nZu4BnvQkinoHYyVU8HgvPgE5Xzeh4vTNpQUNbMR1oeYl; Ex. 39, Salem Red-Tailed Hawk Full Necropsy Report and Photos (Feb. 21, 2024).
[175] Ex. 39, Salem Red-Tailed Hawk Full Necropsy Report and Photos (Feb. 21, 2024).
[176] Ex. 39, Medford Red-Tailed Hawk Full Necropsy Report and Photo (Feb. 8, 2024).
[177] Ex. 39, Wakefield Red-Tailed Hawk Full Necropsy Report and Photo (Jan. 2, 2024).
[178] Ex. 5, Andrew Joslin, FACEBOOK (Dec. 5, 2023, 10:54 AM), https://www.facebook.com/andrew.joslin.33/posts/pfbid0ZPvDDDyf4BcuLukNhN3VCS6dpYaPXyzRTRYsVkeEy56iDfBrctxdZ3HuQV6w8EhQl.
[179] Ex. 39, Somerville Red Tailed Hawk Liver Anticoagulant Panel (Dec. 11, 2023).

	2023-11 Arlington, MA	A red-tailed hawk was found dead by Spy Pond in November 2023. A crowdfunded liver anticoagulant panel revealed the hawk's liver contained brodifacoum.[180]
	Found 2023-10; Released 2023-11-20 Malden, MA	A young red-tailed hawk named "Malden" was found with a puncture wound and significant bruising under his wing, likely from a crash landing. There were numerous rodent bait boxes in the area where Malden was found, which led rescuers to suspect he might have rodenticide poisoning. Subsequent testing revealed that Malden had a low red cell count and his blood was not clotting. Petitioner Hutchings administered a Vitamin K regimen and after 21 days of intensive treatment, Malden recovered and was ultimately released back into the wild.[181]
	2014-04 Cambridge, MA	In April 2014, Ruby, of the famed Fresh Pond red-tailed hawk couple Ruby and Buzz, died of rat poison, according to Tufts Wildlife Clinic. A toxicology report, conducted by clinic veterinarians (including Dr. Maureen Murray), showed that Ruby had been exposed to lethal doses of three different types of anticoagulant rodenticides.[182]
Eastern Screech Owl	2024-04-17 Newburyport, MA	An Eastern screech owl was found in Newburyport and brought to Petitioner Hutchings for care. She was too weak to open her eyes, had a massive bruise on her chest, and repeatedly called out for her mate.[183] She did not survive treatment. A necropsy confirmed that she died of anticoagulant rodenticide poisoning, with FGAR chlorophacinone and SGARs brodifacoum and difethialone in her liver.[184]
	2023-12 Peabody, MA	An Eastern screech owl was found in Peabody just four feet away from a black bait box. Unfortunately, the owl passed away after being transported to Cape Ann Wildlife.[185] A liver anticoagulant panel revealed the owl's liver contained brodifacoum and difethialone.[186]
	2023-12-06 Arlington, MA	A deceased eastern screech owl's body was found in St. Paul Cemetery in Arlington. Both brodifacoum and difethialone were detected in the owl's liver.[187]

[180] Ex. 39, Arlington Red Tailed Hawk Liver Anticoagulant Panel (Dec. 1, 2023); Ex. 5, Save Arlington Wildlife, FACEBOOK (Dec. 7, 2023, 11:31 AM), https://www.facebook.com/SaveArlingtonWildlife/posts/pfbid02WqPgZcH6t1cqNdKB8A9LF2zJkuEWHk5geKShq76EC4jh4GKFJhHQ59uTk6N3avjhl.

[181] Ex. 5, James Joyce II, FACEBOOK (Nov. 24, 2023, 08:09 PM), https://www.facebook.com/permalink.php?story_fbid=pfbid0XkgoQVrBWxKsMwnn2UEkYkegJ9n6yMf5zMoPU63roXeThEFZpzijBrCPTA1Jg4kLl&id=100074979876212.

[182] Ex. 40, Amy Saltzman, *Cambridge's Wildlife is Being Exposed to Rat Poison at Alarming Rates, Researchers Warn*, WCVB5 (Dec. 19, 2018), https://www.wcvb.com/article/cambridges-wildlife-is-being-exposed-to-rat-poison-at-alarming-rates-researchers-warn/25626417#.

[183] Ex. 5, Cape Ann Wildlife, Inc., Facebook (April 13, 2024, 9:36 pm), https://www.facebook.com/CapeAnnWildlifeInc/posts/pfbid0Zm4bQavjFD9Rj5Wp5fjWvFEB1jHNzpYPh5D3LcV6E7xuNXPjcGbGBgcudMsb4shPl?paipv=0&eav=Afau1Jf_JiGs_mDhC-2evQHaZRQJIEsP1O7sybOojG25yqzIgBMVVlqvK1NSx0YC2O4&_rdr.

[184] Ex. 39, Newburyport Eastern Screech Owl Necropsy and Photos (Apr. 17, 2024).

[185] Ex. 5, Dan's Wildlife Rescue, FACEBOOK (Dec. 22, 2023, 05:53 PM), https://www.facebook.com/danswildliferescue/posts/pfbid05bYMnjzN8LF6pCz55dpGr6FBUdgPT4G3W6nrhkfRJnpCpiHmKLPpHot17PVUAeLEl.

[186] Ex. 39, Peabody Eastern Screech Owl Necropsy and Photos (Dec. 16, 2023).

[187] Ex. 39, Arlington St. Paul Cemetery Eastern Screech Owl Anticoagulant Panel and Photo (Jan. 16, 2024).

Cooper's Hawk	2024-04-26 Woburn, MA	A liver test detected brodifacoum, difethialone, bromadiolone in a Cooper's hawk's sample.[188]
	2023-02-20 Arlington, MA	A liver test detected brodifacoum, difethialone, bromadiolone in a Cooper's hawk's sample.[189]
Barred Owl	2023-01-17 Beverly, MA	A liver test detected bromadiolone, brodifacoum, and difethialone in an owl's sample.[190]
	2022-05 Cambridge, MA	A barred owl was brought in for treatment at New England Wildlife Center while he recovered from SGAR poisoning. The owl was found at Mount Auburn Cemetery in Cambridge. When he arrived at the Center, he could not stand up and was "virtually comatose," according to Executive Director Zak Mertz. The owl's treatment consisted of vitamin K, fluids, and anti-inflammatory medications.[191]
Raven	Sample received 2023-06-28 Boston, MA	The Iowa State University Veterinary Diagnostic Laboratory detected brodifacoum in a raven's liver sample.[192]

All of the above-referenced harms are incident to the usage of anticoagulant rodenticides, due to the nature of the poison itself: as explained above, these poisons are designed to kill their victims over several days and necessarily create populations of poison-carrying rodents, who remain alive long enough to transfer the poison to their predators.[193] Therefore, anticoagulant rodenticides impose unreasonable adverse effects on the environment because these poisons, even when used according to their label directions and "in accordance with widespread and commonly recognized practice," effectively guarantee that violations of federal conservation statutes will regularly occur. [194] Although it is unclear whether FWS issues incidental take permits for rodenticide poisonings of protected birds, the evidence shows that a permit is necessary under these circumstances if MDAR has not already obtained one.

[188] Ex. 39, Woburn Coopers Hawk Anticoagulant Panel (Apr. 26, 2024).
[189] Ex. 39, Arlington Coopers Hawk Anticoagulant Panel (Feb. 20, 2023).
[190] Ex. 39, Beverly Barred Owl Anticoagulant Panel (Jan. 13. 2023).
[191] Ex. 41, Breana Pitts, *Massachusetts Wildlife Advocates Want Rat Poison Regulation to Prevent Owl, Eagle Deaths*, CBS BOSTON (May 23, 2022), https://www.cbsnews.com/boston/news/rat-poison-sgars-rodenticides-new-england-wildlife-massachusetts-rep-jim-hawkins-bill/.
[192] Ex. 39, Boston Raven Anticoagulant Panel (July 5, 2023).
[193] *See Restrictions on Rodenticide Products*, *supra* note 2.
[194] *See* G.L. c. 132B, § 7.

C. Rodenticides harm a broad array of non-target wildlife throughout the food chain and thus pose substantial risks to ecosystem health.

Anticoagulant rodenticides further produce "unreasonable adverse effects to the environment" by causing grave harm to wildlife far beyond the animals they are designed to target. As MassWildlife itself has warned, anticoagulant rodenticides cause "secondary poisoning when a predator or scavenger eats prey that has eaten the poisoned bait."[195] As a result, "[a]nticoagulants bioaccumulate, or build up over time, in animals" higher in the food chain, and "[s]econdary poisoning has been documented in birds of prey like eagles, hawks, and owls, as well as mammals like foxes, fishers, bobcats, and coyotes."[196] Through such secondary exposure, anticoagulant rodenticides cause a variety of harms to individual animals, including death, weakening of the immune system, and difficulty with wound healing, and can adversely affect populations and even entire ecosystems.

While the harms of anticoagulant rodenticides for non-target mammals are discussed further below, it is worth briefly reviewing the prevalence of secondary exposure and the species likely to be affected. Numerous studies have documented high incidence of secondary exposure in the following non-target wildlife, all of which occur in Massachusetts:

- **Red Foxes:** Exposure to anticoagulant rodenticides in red foxes has been studied in the United States,[197] Norway,[198] Germany,[199] and Spain,[200] with exposure rates ranging from 54%[201] to 100%.[202] Reports from wildlife rehabilitators and others indicate that such exposure is occurring at concerning rates among foxes across Massachusetts, with anticoagulant rodenticide poisoning implicated in multiple recent fox deaths.[203] These include that of the fox shown below, who was only seven months old when he died.[204] He was found by a wildlife officer on a basketball court and arrived at Newhouse Wildlife Rescue showing symptoms of mange, anticoagulant rodenticide poisoning, skin infections, and severe dehydration.[205] His condition rapidly deteriorated shortly after his arrival, as the combination of mange and suspected rodenticide poisoning was likely too much for his

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[195] Mass. Div. of Fisheries & Wildlife, *Wildlife and rodenticide*, *supra* note 1.
[196] *Id.*
[197] Ex. 42, Robert C. Hosea, *Exposure of Non-Target Wildlife to Anticoagulant Rodenticides in California*, 19 PROCS. OF THE VERTEBRATE PEST CONF. 236, 239 (2000).
[198] Ex. 43, Kristin Opdal Seljetun et al., *Prevalence of Anticoagulant Rodenticides in Feces of Wild Red Foxes (Vulpes vulpes) in Norway*, 55 J. OF WILDLIFE DISEASES 834, 836 (2019).
[199] Ex. 44, Anke Geduhn et al., *Relation between Intensity of Biocide Practice and Residues of Anticoagulant Rodenticides in Red Foxes*, 10 PLOS ONE 9, Sept. 2015, at 6.
[200] Ex. 45, Alberto Carrera et al., *Greater predisposition to second generation anticoagulant rodenticide exposure in red foxes (Vulpes vulpes) weakened by suspected infectious disease*, 907 SCIENCE OF THE TOTAL ENV'T 1, 6 (2024).
[201] Ex. 43, Seljetun et al., *supra* note 198, at 836.
[202] *See* Ex. 42, Hosea, *supra* note 197, at 239.
[203] *See, e.g.*, Ex. 39, Gloucester Fox Anticoagulant Panel (Nov. 26, 2022) (detecting bromadiolone, brodifacoum, and difethialone); Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Jan. 5, 2024, 9:53 AM), https://www.facebook.com/NewhouseWildlifeRescue/posts/pfbid0zBn7DYpPyGxngwD6XtPh3YNP9bS4oVunEFW2gzWJxsxCkrYG6VJ8RMKTUZbtmKjwl; Ex. 5, Newhouse Wildlife Rescue (Nov. 22, 2023), *supra* note 9; Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Dec. 22, 2023, 3:12 PM), https://www.facebook.com/NewhouseWildlifeRescue/posts/pfbid0wneNxavd4t2kduQFWBDBojXKb77QLmDRHuPHATR7khBSuQFANdrMp8dR2HaVJLYFl.
[204] Ex. 5, Newhouse Wildlife Rescue (Nov. 22, 2023), *supra* note 9.
[205] *See* Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Nov. 2, 2023, 11:56 AM), https://www.facebook.com/NewhouseWildlifeRescue/posts/pfbid02eTBPwk5Kd7MFoJK1Ku5t9QjMuRXM3MZjjeYvjxGqGqDsK1EUBH1nu6U2RzGV7t3Jl.

young body to handle.[206] Although rehabilitators spent half an hour trying to revive him, he could not be saved.[207] As discussed below, there is reason to suspect that anticoagulant rodenticide exposure could make mammals like this fox more susceptible to mange due to the rodenticides' impact on their immune systems.[208]



Figures 6, 7, 8. A young fox who died with symptoms of anticoagulant rodenticide poisoning, mange, skin infections, and severe dehydration. **Source**: Newhouse Wildlife Rescue.

- **Mustelids:** A recent study of deceased fishers in New England found that 98% tested positive for at least one anticoagulant rodenticide, and more than half had been exposed to three or more different anticoagulant rodenticides.[209] The study noted that fishers "are generally considered deep forest inhabitants that are not expected to have high exposure" to anticoagulant rodenticides, so the "near universal exposure of the fishers sampled suggests that [anticoagulant rodenticide] exposure is widespread and represents an underestimated health risk to wild fishers. It follows that the same risk exists for other mammalian rodent predators such as bobcats, foxes, and marten, all species essential to their ecosystems in the Northeast."[210] The study also indicated that these toxicants could impact species fitness through interfering with clotting of wounds, suppressing normal immune function, and neonatal transfer of rodenticides.[211] A Danish study documented exposure in 97% of

[206] *See id.*
[207] *Id.*
[208] Compelling research demonstrates rodenticide-related immune dysfunction in bobcats; these impacts have not been studied in other mammals. Ex. 2, Serieys et al., *Widespread Anticoagulant Poison Exposure is Linked with Immune Dysregulation*, *supra* note 5, at 260–62; Ex. 46, Laurel E. K. Serieys et al., *Urbanization and anticoagulant poisons promote immune dysfunction in bobcats*, 285 PROCS. OF THE ROYAL SOC'Y B, at 7–8 (Jan. 2018); Ex. 47, L. E. K. Serieys et al., *Anticoagulant rodenticides in urban bobcats: exposure, risk factors and potential effects based on a 16-year study*, 24 ECOTOXICOLOGY 844, 856, 859 (2015); Ex. 48, Devaughn Fraser et al., *Genome-wide expression reveals multiple systemic effects associated with detection of anticoagulant poisons in bobcats (Lynx rufus)*, 27 MOLECULAR ECOLOGY 1170, 1180, 1182 (2018); Ex. 49, Seth P. D. Riley et al., *Anticoagulant Exposure and Notoedric Mange in Bobcats and Mountain Lions in Urban Southern California*, 71 THE J. OF WILDLIFE MGMT. 1874, 1878 (2007).
[209] Ex. 50, Jacqueline Y. Buckley et al., *High prevalence of anticoagulant rodenticide exposure in New England Fishers (Pekania pennanti)*, 195 ENV'T MONITORING & ASSESSMENT no. 1348, at 3 (Oct. 2023); *see also* Ex. 51, Mourad W. Gabriel et al., *Anticoagulant Rodenticides on our Public and Community Lands: Spatial Distribution of Exposure and Poisoning of a Rare Forest Carnivore*, 7 PLOS ONE 1, 5 (July 2012) (finding that 79% of fishers tested in California had been exposed to one or more anticoagulant rodenticides; diagnosing several deaths directly attributable to anticoagulant rodenticide toxicosis, and documenting neonatal or milk transfer of anticoagulant rodenticides to an altricial fisher kit).
[210] Buckley et al., *supra* note 209, at 1, 6.
[211] *Id.* at 5.

ermines tested,[212] and a 2022 review of conservation threats to mustelids named anticoagulant rodenticide exposure "the main pollutant-related impact for Mustelinae," a subfamily that includes such Massachusetts species as weasels, ermines, and minks.[213]

- **Coyotes:** A 2015 study in Denver found that all coyotes tested were positive for brodifacoum,[214] and a 2003 study in California attributed multiple coyote deaths to anticoagulant rodenticide poisoning.[215] Similar to red foxes, a number of coyotes in Massachusetts have been identified by wildlife rehabilitators as likely victims of anticoagulant rodenticide poisoning.[216] The coyote pictured below, for instance, was found to have abnormal blood-clotting, a symptom of anticoagulant rodenticide poisoning.[217] She was brought to Newhouse Wildlife Rescue with severe mange.[218] Additionally, likely as a result of her mange, this coyote was so emaciated that her ribs are visible in the photo below.[219] Although she ultimately survived, as depicted in the recovery photo below,[220] her close call with death illustrates the devastating impacts anticoagulant rodenticides are having on animals of her kind in Massachusetts.

- **Bobcats:** Extensive research has documented anticoagulant rodenticide exposure in bobcats.[221] In particular, a 16-year study found "high prevalence of [anticoagulant rodenticide] exposure in bobcats since at least 1997" in California, with exposure rates "ranging from 67% to 100% for each 2- to 3-year time period" over the course of the study.[222] As discussed in greater detail below, anticoagulant rodenticide exposure can cause significant harm to bobcats, including by weakening bobcat immune systems and increasing susceptibility to mange.[223] Such impacts can lead to substantial population declines: in one

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[212] Ex. 52, Morten Elmeros et al., *Concentrations of anticoagulant rodenticides in stoats Mustela erminea and weasels Mustela nivalis from Denmark*, 409 SCI. OF THE TOTAL ENV'T 2373, 2375 (2011).
[213] Ex. 53, Patrick G.R. Wright et al., *A global review of the conservation threats and status of mustelids*, 52 MAMMAL REVIEW 410, 417 (2022).
[214] Ex. 54, Sharon A. Poessel et al., *Anticoagulant Rodenticide Exposure and Toxicosis in Coyotes (Canis latrans) in the Denver Metropolitan Area*, 51 J. OF WILDLIFE DISEASES 265, 266 (2015).
[215] *See* Ex. 55, Seth P.D. Riley et al., *Effects of Urbanization and Habitat Fragmentation on Bobcats and Coyotes in Southern California*, 17 CONSERVATION BIOLOGY 566, 569-70 (2003).
[216] *See, e.g.*, Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Dec. 1, 2023, 11:43 AM), https://www.facebook.com/NewhouseWildlifeRescue/posts/pfbid0Y2jx7XS9psNvQfZQSEJJpVWfKdQVRoq1tbpVRbZ3zMD5fzNCNhndfXuvqTWBgJwyl.
[217] *Id.*
[218] *See* Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Nov. 21, 2023, 9:15 AM), https://www.facebook.com/photo/?fbid=735847341912456&set=a.581816817315510&paipv=0&eav=AfaxReXabBxueEAy8vwN6nR_Yi125G4p9kvvI8xGlnPGn0nAzFqJDZtmnq3fkMHNhWU&_rdr.
[219] *See* Ex. 5, Newhouse Wildlife Rescue (Nov. 21, 2023), *supra* note 218; *see also* Cornell Wildlife Health Lab, *Mange*, CORNELL UNIV. COLL. OF VETERINARY MED., https://cwhl.vet.cornell.edu/system/files/public/cwhl-fact-sheetsmange.pdf ("Advanced cases [of mange] can result in severe hair loss and systemic bacterial infections with emaciation, depression, hypothermia and death.").
[220] *See* Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Jan. 16, 2024, 3:39 PM), https://www.facebook.com/NewhouseWildlifeRescue/posts/pfbid02LypS2icMbpNQng79TJeGZafnBDfzNPR3kcRRmFJNzBGntJh1zDTf7GXmJzXoLyqml.
[221] *See* Ex. 2, Serieys et al., *Widespread Anticoagulant Poison Exposure is Linked with Immune Dysregulation*, *supra* note 5, at 259 (discussing a series of studies on anticoagulant rodenticide exposure on bobcats in California).
[222] Ex. 47, Serieys et al., *Anticoagulant rodenticides in urban bobcats*, *supra* note 208, at 857.
[223] Ex. 2, Serieys et al., *Widespread Anticoagulant Poison Exposure is Linked with Immune Dysregulation*, *supra* note 5, at 260-62.

study of California bobcats, anticoagulant rodenticides were linked to a mange outbreak that reduced the annual bobcat survival rate by more than half over a two-year period.[224]

Figures 9, 10, 11. A female coyote who nearly died from a combination of symptoms suggestive of anticoagulant rodenticide poisoning, severe mange, and emaciation. The photos were taken over the course of her recovery, with the image on the left showing her arrival at Newhouse Wildlife Rescue, the image on the top right showing a little over a week into her recovery, and the image on the bottom right depicting her over a month later. **Source**: Newhouse Wildlife Rescue.

The above-referenced studies document high rates of exposure across the food web and thus indicate that rodenticide exposure is not merely possible but highly likely for a range of Massachusetts species.

Such secondary poisoning causes severe harms to wildlife. Chief among these, anticoagulant rodenticide poisoning can cause fatal internal bleeding in non-target species just as it is designed to do in rodents.[225] Indeed, in one five-year study of 401 reptiles, mammals, and birds from over 60 different species with suspected anticoagulant rodenticide exposure, results showed that over one third of them "may have died by [anticoagulant rodenticide] poisoning."[226] Similarly, researchers studying a mass mortality event in frogs found the SGAR brodifacoum in 17% of the 77 liver

[224] *See* Ex. 49, Riley et al., *Anticoagulant Exposure and Notoedric Mange in Bobcats and Mountain Lions*, *supra* note 208, at 1878-79 (2007); Ex. 47, Serieys et al., *Anticoagulant rodenticides in urban bobcats*, *supra* note 208.

[225] Mass. Div. of Fisheries & Wildlife, *Wildlife and rodenticide*, *supra* note 1.

[226] Ex. 56, Inés Sánchez-Barbudo et al., *Primary and secondary poisoning by anticoagulant rodenticides of non-target animals in Spain*, 420 SCI. OF THE TOTAL ENV'T 280, 283 (2012); *see also* Ex. 51, Gabriel et al., *supra* note 209, at 6 (finding that 4 of 58 fishers tested died of lethal toxicosis due to anticoagulant rodenticide exposure); Ex. 55, Riley et al., *Effects of Urbanization and Habitat Fragmentation*, *supra* note 215, at 569-70 (documenting the deaths of multiple coyotes due to anticoagulant rodenticide toxicosis).

samples tested.[227] This is the first report of rodenticides in wild frogs, and the route of exposure is unknown.[228]

Furthermore, even sublethal levels of anticoagulant rodenticide exposure can have significant consequences. Most notably, extensive research on bobcats in California has suggested that anticoagulant rodenticide exposure is linked to severe mange.[229] A dangerous disease for wildlife, mange "can cause extensive dermatitis resulting in emaciation, secondary systemic problems such as septicemia [i.e. blood poisoning] and hypoglycemia, and changes in activity including weakness, incoordination, and coma."[230] Among the evidence of this correlation, bobcats in a 2015 study "were 7.3 times . . . more likely to die with severe mange than without if they were exposed to 2 or more [anticoagulant rodenticide] compounds," and those with concentrations of .25 ppm or greater of anticoagulant rodenticides in their liver "were 3.2 times . . . more likely to die with severe mange."[231] Additionally, "[s]ixty-nine of 70 bobcats that died with severe mange . . . were exposed to [anticoagulant rodenticides]."[232] As further research revealed, this link likely occurs because exposure to anticoagulant rodenticides weakens bobcats' immune systems and disrupts the integrity of their skin, making them more vulnerable to diseases like mange.[233] Researchers emphasized that the "complex systemic physiological and immunological consequences" caused by anticoagulant rodenticides "can cascade into population-level effects," and potentially even "ecosystem-wide impacts."[234]

The interplay of mange and anticoagulant rodenticides has not been extensively studied outside of bobcats, but evidence suggests that such consequences may be occurring in other Massachusetts mammals: media reports indicate widespread instances of foxes and coyotes suffering from

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[227] Ex. 57, Jodi J.L. Rowley, et al., *Broad-scale pesticide screening finds anticoagulant rodenticide and legacy pesticides in Australian frogs*, 930 SCI. OF THE TOTAL ENV'T no. 172526 at 4 (Apr. 2024).

[228] *Id.* ("Potential routes of exposure for amphibians to ARs include direct contact with contaminated water or bait stations, consumption of contaminated invertebrates, or, for the larger frogs specifically, predation of poisoned rodents." (internal citations omitted)).

[229] *See* Ex. 2, Serieys et al., *Widespread Anticoagulant Poison Exposure is Linked with Immune Dysregulation*, *supra* note 5, at 260-62; Ex. 46, Serieys et al., *Urbanization and anticoagulant poisons promote immune dysfunction in bobcats*, *supra* note 208, at 7-8; Ex. 47, Serieys et al., *Anticoagulant rodenticides in urban bobcats*, *supra* note 208, at 859 (2015); Ex. 48, Fraser et al., *supra* note 208, at 1180, 1182; Ex. 49, Riley et al., *Anticoagulant Exposure and Notoedric Mange in Bobcats and Mountain Lions*, *supra* note 208, at 1878.

[230] Ex. 2, Serieys et al., *Widespread Anticoagulant Poison Exposure is Linked with Immune Dysregulation*, *supra* note 5, at 259 (2018).

[231] Ex. 47, Serieys et al., *Anticoagulant rodenticides in urban bobcats*, *supra* note 208, at 856.

[232] *Id.* at 859.

[233] Ex. 2, Serieys et al., *Widespread Anticoagulant Poison Exposure is Linked with Immune Dysregulation*, *supra* note 5, at 260-62; *see also* Mass. Div. of Fisheries & Wildlife, *Wildlife and rodenticide*, *supra* note 1.

[234] Ex. 2, Serieys et al., *Widespread Anticoagulant Poison Exposure is Linked with Immune Dysregulation*, *supra* note 5, at 262.

mange,[235] and wildlife rehabilitators have documented numerous cases of carnivores with symptoms of both anticoagulant rodenticide poisoning and severe mange, including several deaths.[236]

Figures 12, 13, 14. Oscar and Felix, two young foxes who nearly died from a combination of symptoms indicative of mange and anticoagulant rodenticide poisoning. These photos were taken over the course of their recovery process, with the image on the left showing their arrival at Newhouse Wildlife Rescue, underweight with thick crusts and missing patches of fur; the center image showing a little over a week into their recovery; and the image on the right depicting Oscar and Felix approximately one month into recovery. **Source**: Newhouse Wildlife Rescue.

For example, the above-pictured foxes, Oscar and Felix, were part of a litter of three red foxes treated at Newhouse Wildlife Rescue for mange, skin infections, and rodenticide poisoning.[237] Oscar and Felix were found in a barn with thick crusts along their faces, a common symptom of mange.[238] Upon intake at Newhouse Wildlife Rescue, it became clear that their blood was clotting at rates much slower than normal, a sign of anticoagulant rodenticide poisoning.[239] They were stressed, barely able to stand, and not expected to survive.[240] Oscar and Felix ultimately recovered over the

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[235] *See, e.g.*, Ex. 58, Ashley Shook, *Sightings of mangy foxes reported to Animal Control,* WWLP.COM (Aug. 3, 2022), https://www.wwlp.com/news/local-news/sightings-of-mangy-foxes-reported-to-animal-control/; Ex. 58, *Chelmsford woman helps nurse fox back to health, pushing for rat poison restrictions*, WCVB.COM (Aug. 4, 2021), https://www.wcvb.com/article/chelmsford-woman-helps-nurse-fox-back-to-health-pushing-for-rat-poison-restrictions/37224302; Ex. 58, Marc Fortier, *Sick Coyote Spotted Wandering Around Newton*, NBC BOSTON (Sept. 6, 2022), https://www.nbcboston.com/news/local/sick-coyote-spotted-wandering-around-newton/2827528/; Ex. 58, Scott Souza, *Ragged-Looking North Short Coyotes Likely More Mangy Than Rabid*, PATCH (Oct. 21, 2022), https://patch.com/massachusetts/beverly/ragged-looking-north-shore-coyotes-likely-more-mangey-rabid; Ex. 58, Dave Puglisi, *7 Investigates: Coyote Concern*, 7 NEWS BOSTON (Aug. 22, 2023), https://whdh.com/news/7-investigates-coyote-concern/.

[236] *See, e.g.*, Ex. 39, Gloucester Fox Anticoagulant Panel, *supra* note 203; Ex. 5, Newhouse Wildlife Rescue (Jan. 5, 2024), *supra* note 203; Ex. 5, Newhouse Wildlife Rescue (Dec. 1, 2023), *supra* note 216; Ex. 5, Newhouse Wildlife Rescue (Nov. 22, 2023), *supra* note 9; Ex. 5Newhouse Wildlife Rescue (Dec. 22, 2023), *supra* note 203.

[237] *See* Ex. 5, Newhouse Wildlife Rescue (Dec. 22, 2023), *supra* note 203; Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Oct. 25, 2023, 1:34 PM), https://www.facebook.com/NewhouseWildlifeRescue/posts/pfbid0J3frXRGkUMhHC2FicNP2VPywUg7ZJop3GYxtoJLNssBctVXVYWmfwgyKMesYrfF7l; Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Oct. 26, 2023, 1:03 PM), https://www.facebook.com/NewhouseWildlifeRescue/posts/pfbid02yUXez4XH6of3Stbvsn4J4EhVqY3t9AzdWmzMgpnffss1ZVPvWp3yaMhxXS7iLroal.

[238] Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Nov. 23, 2023, 7:43 PM), https://www.facebook.com/NewhouseWildlifeRescue/posts/pfbid0vUmzybzuf32xwFRtJuKWZFzpHj6dyv7X8kEQdqnWHR1PwD143SJKEvW8YCKjB6h5l; Ex. 5, Newhouse Wildlife Rescue (Dec. 22, 2023), *supra* note 203.

[239] Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Oct. 18, 2023, 6:26 PM), https://www.facebook.com/NewhouseWildlifeRescue/posts/pfbid0zH45XcwS24nebJjxnmfdi5zudwfCAuqw7TQnxzi1hUt3JvdW5jZgyG5B36rvhkhEl.

[240] *Id.*; Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Oct. 19 2023, 11:04 AM), https://www.facebook.com/NewhouseWildlifeRescue/posts/pfbid09AdonQJWSY2zr3GWGVa7qKrXYsEZyJ2SYqzBFaUrUVzWDAY87bidogn8Zey75Locl; Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Oct. 20, 2023, 11:33 AM), https://www.facebook.com/watch/?v=259240177087870.

course of a multi-week treatment for mange and anticoagulant rodenticide poisoning, gradually regaining their strength and regrowing their coats.[241] Sadly, however, their sister did not recover.[242] She was brought in only about a week later than Oscar and Felix, with similar symptoms, but her condition was far worse.[243] Severe mange can lead to emaciation and hypothermia,[244] and their sister showed signs of both: her temperature was so low that it did not even register on a thermometer, and she went into hypoglycemic seizure shortly after she was brought to Newhouse Wildlife Rescue.[245] She died within a day of her arrival, at the age of only seven months old, and a necropsy confirmed that she had been poisoned with the SGAR bromadiolone.[246] Her death is one of many that Newhouse Wildlife Rescue has witnessed in connection to anticoagulant rodenticide poisoning in foxes.

In addition to making wildlife more susceptible to disease, anticoagulant rodenticides elevate the risks associated with everyday wounds and injuries. For example, in fishers, "sub-lethal [anticoagulant rodenticide] levels may still be a risk for ineffective blood clotting."[247] As a result, anticoagulant rodenticide exposure may transform the minor scratches that fishers often suffer while hunting into severe wounds.[248] Similarly, in a 2015 study, two coyotes died of "acute severe hemorrhage" despite having only minor to moderate injuries, leading researchers to conclude that sublethal levels of anticoagulant rodenticides contributed to their deaths.[249] Thus, even where poisoning is insufficient to cause fatal hemorrhaging on its own, anticoagulants can exacerbate bleeding to such an extent that animals wind up dying from wounds that would otherwise have been only minor or moderate.

Secondary exposure to anticoagulant rodenticides has been shown not only to adversely affect individual animals but also entire populations. The danger of population-level effects is particularly evident in the research on California bobcats: anticoagulant rodenticides were linked to a severe outbreak of mange, which reduced the annual bobcat survival rate by more than half over a two-year period and resulted in local extirpations of bobcats.[250] The precipitous decline of California's bobcat population illustrates how even sublethal exposure levels of anticoagulant rodenticides can have devastating consequences. Moreover, such impacts are not limited to bobcats: both red foxes and weasels have been shown to experience local population declines in response to anticoagulant rodenticide exposure.[251]

Finally, such declines have the potential to create perverse trophic effects: lowering predator populations suppresses their natural control of prey, giving rise to a dangerous cycle in which people

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[241] *See* Ex. 5, Newhouse Wildlife Rescue, FACEBOOK (Nov. 5, 2023, 8:22 AM), https://www.facebook.com/NewhouseWildlifeRescue/posts/pfbid0RHFoG4xsGegaoPoTf1Hc867KWtiiNN2Do4KzhT1uuDzN8uM9k1kPw4dxyfeAyehil; Ex. 5, Newhouse Wildlife Rescue (Dec. 22, 2023), *supra* note 203.

[242] Ex. 5, Newhouse Wildlife Rescue (Oct. 26, 2023), *supra* note 237.

[243] *See* Ex. 5, Newhouse Wildlife Rescue (Oct. 25, 2023), *supra* note 237.

[244] Cornell Wildlife Health Lab, *Mange*, *supra* note 219.

[245] *See* Ex. 5*,* Newhouse Wildlife Rescue (Oct. 25, 2023), *supra* note 237.

[246] *See* Ex. 5, Newhouse Wildlife Rescue (Oct. 26, 2023), *supra* note 237; Ex. 5*,* Newhouse Wildlife Rescue (Nov. 22, 2023), *supra* note 9.

[247] Ex. 50, Buckley et al., *supra* note 209, at 5.

[248] *Id.*

[249] Ex. 54, Poessel et al., *supra* note 214, at 266-67.

[250] *See* Ex. 49, Riley et al., *Anticoagulant Exposure and Notoedric Mange in Bobcats and Mountain Lions*, *supra* note 208, at 1878-79 (2007); Ex. 47, Serieys et al., *Anticoagulant rodenticides in urban bobcats*, *supra* note 208.

[251] *See* Ex. 59, Marion Jacquot et al., *Using long-term monitoring of red fox populations to assess changes in rodent control practices*, 50 J. OF APPLIED ECOLOGY 1406, 1410 (2013); Ex. 60, Javier Fernandez-de-Simon et al., *Do bromadiolone treatments to control grassland water voles (Arvicola scherman) affect small mustelid abundance?*, 75 PEST MGMT. SCI. 900, 905-06 (2019).

may use even more rodenticides to compensate for loss of natural predators.[252] All of the species discussed above are natural predators of rats in Massachusetts. The continued use of rodenticides will have devastating unintended consequences for non-target wildlife and will be counterproductive to the intended goal of reducing rodent populations.

Based on the above evidence, anticoagulant rodenticides pose severe, unintended consequences on a broad range of Massachusetts wildlife. As experts have emphasized, the evidence "strongly suggest[s] that the indiscriminate nature of these ubiquitous toxicants can not only have population-level effects for some species, but potentially also cascade into ecosystem-wide impacts."[253] The fact that anticoagulant rodenticides have harmed numerous wild animals and possess the capacity to disrupt entire ecosystems establishes their unreasonable adverse effects on the environment. Thus, an immediate suspension and review of their registration by the Subcommittee is warranted.

D. Rodenticides pose an unreasonable risk to domestic dogs and cats.

Rodenticides poison numerous companion animals each year and thus present an unreasonable risk to "other living animals."[254] According to the ASPCA's Animal Poison Control Center, which handles hundreds of thousands of animal poison-related emergencies per year, rodenticides have consistently ranked among the top ten pet toxins for the past decade.[255] Despite current measures designed to protect dogs and cats, remaining avenues of exposure could include such instances as a neighbor setting out bait without a pet owner's knowledge, a dog getting into a damaged bait box, and a barn cat's secondary exposure through repeated preying on rodents.[256] In Massachusetts, "[t]he MSPCA's Angell Animal Medical Centers alone see dozens of cases of companion animals poisonings each year," and "cases peak during spring and fall, when landlords and homeowners are most affected by the presence of mice or rats."[257] More broadly, rodenticides remain responsible for

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[252] *See* Ex. 61, Virgile Baudrot et al., *Trophic transfer of pesticides: The fine line between predator-prey regulation and pesticide-pest regulation*, 57 J. OF APPLIED ECOLOGY, 806, 815 (2020).

[253] Ex. 2, Serieys et al., *Widespread Anticoagulant Poison Exposure is Linked with Immune Dysregulation*, *supra* note 5, at 262.

[254] *See* G.L c. 132B, § 2 (defining "environment" to include "other living animals").

[255] *See The Official Top 10 Pet Toxins of 2023,* ASPCA (Mar. 21, 2024), https://www.aspca.org/news/official-top-10-pet-toxins-2023; *The Official Top 10 Pet Toxins of 2022*, ASPCA (Mar. 23, 2023), https://www.aspca.org/news/official-top-10-pet-toxins-2022; *ASPCA Animal Poison Control Center Reaches 4 Million Cases of Pet Toxicity, a Significant Milestone in Keeping Animals Safe in Emergency Situations*, ASPCA (Mar. 9, 2022), https://www.aspca.org/about-us/press-releases/aspca-animal-poison-control-center-reaches-4-million-cases-pet-toxicity; *The Official Top 10 Pet Toxins of 2020*, ASPCA, https://www.aspcapro.org/resource/top-10-pet-toxins-2020 (last visited Feb. 18, 2024); *Announcing: The Top 10 Pet Toxins!,* ASPCA (Mar. 13, 2020); *Top 10 Animal Toxins of 2018*, ASPCA (Mar. 7, 2019), https://www.aspcapro.org/news/2019/03/07/top-10-animal-toxins-2018; *Announcing the Top Pet Toxins of 2017!*, ASPCA (Mar. 15, 2018), https://www.aspca.org/news/announcing-top-pet-toxins-2017; *Announcing the Top Pet Toxins of 2016*, ASPCA (Mar. 1, 2017), https://www.aspca.org/news/announcing-top-pet-toxins-2016; *Announcing the Top Pet Toxins of 2015*, ASPCA (Mar. 3, 2016), https://www.aspca.org/news/announcing-top-pet-toxins-2015; *Ten Most Common Pet Toxins of 2014*, ASPCA (Apr. 15, 2015), https://www.aspca.org/news/ten-most-common-pet-toxins-2014; *ASPCA Reveals Top Animal Poison Concerns*, ASPCA (Mar. 18, 2014), https://www.aspca.org/about-us/press-releases/aspca-reveals-top-animal-poison-concerns.

[256] Ex. 62, Valentina Merola, *Anticoagulant rodenticides: Deadly for pests, dangerous for pets*, 97 VETERINARY MED. 716, 716-17 (2002).

[257] *Rodenticides*, MSPCA ANGELL, https://www.mspca.org/animal_protection/rodenticides/ (last visited May 2, 2024).

thousands of pet poisonings each year.[258] Indeed, according to one Massachusetts veterinarian, "[t]he Brodifacoum group is the second most common toxicant associated with death in pets."[259]

When such poisoning occurs, "immediate veterinary care is critical."[260] Without early intervention, internal bleeding will typically begin within three to five days,[261] and veterinarians have emphasized that "[o]nce bleeding starts, it's far harder to treat, requiring multiple transfusions and 24-hour intensive care, and at this point, it is usually fatal."[262] Among the effects of anticoagulant rodenticides in companion animals, "[a]cute bleeding into the thorax or abdomen can cause anemia, shock, and death," and, "rapid bleeding into the brain or spinal cord" can result in "seizures, or death."[263] Even when veterinarians are able to treat bleeding, the long half-lives of anticoagulant rodenticides mean that the process often requires 3 to 4 weeks of close care to ensure no further internal bleeding escapes notice.[264] In a recent study of dogs presenting with internal bleeding, survival rate was 87%.[265] Yet, even in instances of survival, "[t]he cost of veterinary care to treat an animal who has ingested rat poison can exceed $2,000 and treatment can require weeks of supportive care and medication, putting a significant financial and emotional strain on families."[266] Moreover, though the study's authors presented this survival rate as a good prognosis, it nevertheless suggests that approximately 1 in 10 cases where a dog experiences internal bleeding from anticoagulant rodenticides may result in the devastating and preventable loss of a beloved family member.[267]

Anticoagulant rodenticides thus cause extreme pain and suffering to many companion animals and their families each year. In assessing a pesticide's unreasonable adverse effects on the environment, the Subcommittee must consider "the *economic*, *social* and environmental costs and benefits of the use of any pesticide."[268] The heavy financial and emotional toll these poisons take on families whose companion animals ingest them weighs against their continued registration.

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[258] *See, e.g.*, *Announcing the Top Pet Toxins of 2015*, ASPCA, https://www.aspca.org/news/announcing-top-pet-toxins-2015 (last visited Apr. 25, 2024) ("Last year, [the ASPCA Animal Poison Control Center] handled more than 8,100 cases involving rodenticides.").

[259] Ex. 63, Wendall Waters, *Did you know rodent poisons are dangerous to cats and dogs? A veterinarian explains why*, WICKEDLOCAL.COM (Oct. 20, 2022), https://www.wickedlocal.com/story/regional/2022/10/20/rodenticides-kill-dogs-cats-wildlife-veterinarian-sgars-massachusetts-legislature-bill/10399072002/.

[260] *Rodenticide and Your Pet: What You Need to Know*, ASPCA, https://www.aspca.org/news/rodenticide-and-your-pet-what-you-need-know (last visited Feb. 18, 2024).

[261] *Id.*

[262] Ex. 64, Michelle Gerhard Jasny V.M.D., *Visiting Vet: When Starr ate rat poison*, THE MARTHA'S VINEYARD TIMES (Oct. 28, 2015), https://www.mvtimes.com/2015/10/28/when-starr-ate-rat-poison/;*see also* Ex. 63, Waters, *supra* note 259.

[263] Ex. 62, Merola, *supra* note 256, at 719.

[264] Ex. 63, Waters, *supra* note 259.

[265] Ex. 65, Sarah Stroope et al., *Retrospective Evaluation of Clinical Bleeding in Dogs with Anticoagulant Rodenticide Toxicity – A Multi-Center Evaluation of 62 Cases (2010-2020)*, 9 FRONTIERS IN VETERINARY SCI. 879179, May 2022, at 4.

[266] *Rodenticides*, MSPCA ANGELL, *supra* note 257.

[267] *See* Ex. 65, Stroope et al., *supra* note 265, at 4; *see also* Ex. 66, Dave Rogers, *After dog's death, family seeks to educate about rodenticides*, THE DAILY NEWS (Feb. 26, 2016), https://www.newburyportnews.com/news/local_news/after-dogs-death-family-seeks-to-educate-about-rodenticides/article_03d3d1a5-231e-54ff-9cfe-c645c28a23b3.html; Ex. 66, Corey Bullock, *Wycliffe family urging against rodenticide use after dog dies from poisoning*, KIMBERLY BULL. (Feb. 23, 2022 12:20 PM), https://www.kimberleybulletin.com/news/wycliffe-family-urging-against-rodenticide-use-after-dog-dies-from-poisoning-5217374; Ex. 66, Andrew Hughes, *Squamish cat owner loses pet to poisoning*, The SQUAMISH CHIEF (Aug. 23, 2023 12:15 PM), https://www.squamishchief.com/local-news/squamish-cat-owner-loses-pet-to-poisoning-7446498.

[268] 333 Code Mass. Regs. § 2.03(4) (emphasis added).

E. Rodenticides pose an unreasonable risk to humans, particularly children.

Current regulations have proven insufficient to protect humans, particularly children, from the unreasonable risk of anticoagulant rodenticide poisoning. Based on the American Association of Poison Control Centers' (AAPCC) 2018-2022 annual reports, over 3,000 people per year report exposures to long-acting anticoagulant rodenticides.[269] In Massachusetts alone, there were close to 200 cases of anticoagulant rodenticide exposure in the past three years, and almost half of them occurred among children under the age of 6.[270] A review of 25 years' worth of data yielded similarly alarming trends: 315,951 exposures were reported, more than 100,000 of which resulted in treatment in a health care facility.[271]

Rodenticides are especially dangerous to young children, who may be attracted to the bright colors and food-like taste and smell of rodenticides while failing to understand the harms of ingesting them.[272] Unsurprisingly, a 25-year review of poison data found that nearly 90% of anticoagulant rodenticide exposures occurred among children.[273] AAPCC data shows that the risk to children persists: from 2018 to 2022, over 13,000 children under 6 were exposed to anticoagulant rodenticides.[274]

Such poisonings can have significant consequences for human health, including death.[275] Symptoms include vomiting blood, bruising and bleeding under the skin, bloody urine, and confusion, lethargy, or altered mental status from bleeding in the brain.[276] Moreover, due to the delayed effects of anticoagulant rodenticides, poisoning can be challenging to diagnose.[277] With accidental poisonings in children, for example, children may present fine initially after ingestion, giving parents a false sense of security.[278]

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[269] *See* Ex. 67, David D. Gummin et al., *2022 Annual Report of the National Poison Data System (NPDS) from America's Poison Centers: 40th Annual Report*, 61 CLINICAL TOXICOLOGY 717, 890 (2023); Ex. 67, David D. Gummin et al., *2021 Annual Report of the National Poison Data System (NPDS) from America's Poison Centers: 39th Annual Report*, 60 CLINICAL TOXICOLOGY 1381, 1589 (2022); Ex. 67, David D. Gummin et al., *2020 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 38th Annual Report*, 59 CLINICAL TOXICOLOGY 1282, 1455 (2021); Ex. 67, David D. Gummin et al., *2019 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 37th Annual Report*, 58 CLINICAL TOXICOLOGY 1360, 1492 (2020); Ex. 67, David D. Gummin et al., *2018 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 36th Annual Report*, 57 CLINICAL TOXICOLOGY 1220, 1395 (2019).

[270] Ex. 68, Mass. Dep't of Pub. Health, Bureau of Cmty. Health & Prevention, *Toxic Exposure Surveillance System Data 2021-2023*.

[271] Ex. 69, Nathan King & Minh-Ha Tran, *Long-Acting Anticoagulant Rodenticide (Superwarfarin) Poisoning: A Review of Its Historical Development, Epidemiology, and Clinical Management*, 29 TRANSFUSION MED. REVS. 250, 253 (2015).

[272] *Rodenticides (Rat and Mouse Poisons)*, CHILD.'S HOSP. OF PHILADELPHIA, https://www.chop.edu/centers-programs/poison-control-center/rodenticides-rat-and-mouse-poisons (last visited Feb. 18, 2024).

[273] *See* Ex. 69, King & Tran, *supra* note 271.

[274] *See* Ex. 67, Gummin et al., *2022 Annual Report of the National Poison Data System*, *supra* note 269, at 890; Ex. 67, Gummin et al., *2021 Annual Report of the National Poison Data System*, *supra* note 269, at 1589; Ex. 67, Gummin et al., *2020 Annual Report of the American Association of Poison Control Centers*, *supra* note 269, at 1455; Ex. 67, Gummin et al., *2019 Annual Report of the American Association of Poison Control Centers*, *supra* note 269, 1492; Ex. 67, Gummin et al., *2018 Annual Report of the American Association of Poison Control Centers*, *supra* note 269, at 1395.

[275] *See Anticoagulant rodenticides poisoning*, *supra* note 107.

[276] *Id.*

[277] *See* Ex. 69, King & Tran, *supra* note 271, at 254.

[278] *Rodenticides (Rat and Mouse Poisons)*, *supra* note 272.

Critically, if left untreated, anticoagulant rodenticide poisoning can cause death, typically from bleeding in the brain.[279] Other serious complications can include damage to the heart or other vital organs, in which case complete recovery may be impossible.[280] Finally, due to the long half-lives of anticoagulant rodenticides, even full recovery can be lengthy and expensive: one study reported a median treatment time of 140 days, with a range extending to 730 days, and an outpatient treatment cost of $25,000 to $37,000 per month.[281]

Although incidents of anticoagulant rodenticide poisoning of humans have declined in the past decade, the danger remains unacceptably high. In the years since the EPA imposed certain restrictions on the sale and application of anticoagulant rodenticides in 2008, the numbers of poisonings have declined with each year, going from over 9,000 cases nationwide in 2012 to just over 3,000 in 2022.[282] Similarly, the percentage of cases among children under 6 has declined from approximately 86% in 2012 to approximately 72% in 2022.[283] However, such poisonings do continue to occur, and, as summarized above, they pose substantial health risks for their victims, many of whom continue to be children. Recognizing the severity of the continued danger, the EPA recently proposed that "additional human health mitigation measures are necessary to further reduce the potential for human health exposures, including exposures to children."[284] The ongoing risk warrants further measures to prevent unnecessary harm.

Anticoagulant rodenticide poisoning thus poses severe health risks for humans and continues to occur across the United States by the thousands each year, with the vast majority of cases involving children.[285] The evidence indicates that the human health risks attached to anticoagulant rodenticides remain unreasonably high, and we therefore respectfully urge the Subcommittee to suspend and conduct individual review of all anticoagulant rodenticide registrations.

F. There is growing consensus that anticoagulant rodenticides pose unreasonable risks and should be restricted.

A recent rise in regulatory and legislative action to restrict anticoagulant rodenticide use across the nation demonstrates the extent of the unreasonable adverse environmental effects caused by anticoagulant rodenticides.

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[279] *See Anticoagulant rodenticides poisoning*, *supra* note 107; Ex. 70, Gowthami M. Arepally & Thomas L. Ortel, *Bad weed: synthetic cannabinoid-associated coagulopathy*, 133 BLOOD 902, 902 (2019); Ex. 71, Jason M. Devgun et al., *An outbreak of severe coagulopathy from synthetic cannabinoids tainted with Long-Acting anticoagulant rodenticides,* 58 CLINICAL TOXICOLOGY 821, 825 (2020).

[280] *Anticoagulant rodenticides poisoning*, *supra* note 107.

[281] Ex. 70, Arepally & Ortel, *supra* note 279, at 904.

[282] *Compare* Ex. 67, Gummin et al., *2022 Annual Report of the National Poison Data System*, *supra* note 269, *with* Ex. 72, David D. Gummin et al., *2012 Annual Report of the National Poison Data System (NPDS) from America's Poison Centers: 30th Annual Report*, 51 CLINICAL TOXICOLOGY 949, 1166 (2013).

[283] *Compare* Ex. 67, Gummin et al., *2022 Annual Report of the National Poison Data System*, *supra* note 269, *with* Ex. 72, Gummin et al., *2012 Annual Report of the National Poison Data System*, supra note 279.

[284] Ex. 73, EPA, *Proposed Interim Registration Review Decision for Seven Anticoagulant Rodenticides* 49-50 (Nov. 2022), https://www.regulations.gov/document/EPA-HQ-OPP-2015-0768-0056.

[285] *See* Ex. 67, Gummin et al., *2022 Annual Report of the National Poison Data System*, *supra* note 269, at 890; Ex. 67, Gummin et al., *2021 Annual Report of the National Poison Data System*, *supra* note 269, at 1589; Ex. 67, Gummin et al., *2020 Annual Report of the American Association of Poison Control Centers*, *supra* note 269, at 1455; Ex. 67, Gummin et al., *2019 Annual Report of the American Association of Poison Control Centers*, *supra* note 269, 1492; Ex. 67, Gummin et al., *2018 Annual Report of the American Association of Poison Control Centers*, *supra* note 269, at 1395.

1. EPA has proposed to reclassify anticoagulant rodenticides for restricted use.

Anticoagulant rodenticides—including both FGARs and SGARs—are currently classified for general use under FIFRA.[286] However, EPA has expressed serious concerns about the impacts of these rodenticides on the health and well-being of children and the environment since at least 1993.[287]

In 2008, EPA issued a "Risk Mitigation Decision for Ten Rodenticides" (hereinafter "2008 RMD") detailing the extensive harms caused by registered rodenticides, including both FGARs and SGARs.[288] Although these rodenticides remained classified for "general use," the 2008 RMD imposed additional restrictions intended to "minimize children's exposure to rodenticide products" and to "reduce wildlife exposures and ecological risks."[289] These restrictions included the following marketing, packaging, and size restrictions for rodenticide products based on their active ingredient(s) and intended use:

- "Consumer size" products containing up to 1 pound of FGAR-based bait may be purchased over the counter, but they must be sold with ready-to-use bait stations unless they are labeled solely for outdoor use.[290]
- "Consumer-size" FGAR products are restricted to those bait forms "reasonably expected" to remain within bait stations; pellets are prohibited.[291]
- SGARs may not be sold as "consumer size" products.[292]
- SGARs may be sold for agricultural use in packages containing at least 8 pounds of bait or for use by professional pest control operators in packages containing at least 16 pounds of bait.[293] These products do not need to be sold in bait stations but their label must state that bait stations are required for indoor use.[294]
- SGARs intended for agricultural or professional use may be sold in any form except liquid, including pellets.[295]

At the time, EPA believed the 2008 RMD restrictions would sufficiently reduce consumers' use of anticoagulant rodenticides—in particular, SGARs—to prevent unreasonable adverse effects to the environment.[296] In reality, these products are readily accessible in bulk quantities online to consumers who do not understand the potency or danger of the chemicals they contain.[297]

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[286] *Active Pesticide Product Registration Informational Listing (APPRIL)*, *supra* note 37.

[287] Ex. 11, EPA, *Revised Risk Mitigation Decision for Ten Rodenticides*, *supra* note 37.

[288] *See, generally, id.*; *id.* at 7–8 (noting that 12,000 to 15,000 children under six were exposed to rodenticides annually, and that "widespread [secondary] exposures to second-generation anticoagulants [were] occurring wherever those rodenticides [were] being used," impacting at least 27 avian species and 17 mammalian species.).

[289] *Id.* at 1–2.

[290] *Id.* at 17.

[291] *Id.* at 17–18.

[292] *Id.* at 17.

[293] *Id.* at 18–19.

[294] *Id.*

[295] *Id.*

[296] *See id.* at 17 ("EPA believes that these size limits will effectively discourage residential users from obtaining rodenticides that are not appropriate for residential use or that should be applied only by professionals.").

[297] Ex. 74, Chris Sweeney, *The Internet Has a Rat Poison Problem*, AUDUBON MAGAZINE (2021), https://www.audubon.org/magazine/winter-2021/the-internet-has-rat-poison-problem. To illustrate, a consumer who had purchased bromadiolone online described it as "a pro-grade product sold only in 16-pound amounts

Furthermore, EPA's 2020 *Draft Ecological Risk Assessment* revealed a persisting need for additional measures to reduce rodenticide exposure to non-target animals, including various endangered species, even after the 2008 RMD was put into place.[298]

In November 2022, EPA began its 15-year registration review of brodifacoum, bromadiolone, bromethalin, chlorophacinone, cholecalciferol, difenacoum, difethialone, diphacinone, strychnine, warfarin, and zinc phosphide.[299] EPA also issued Proposed Interim Decisions (PIDs) for these rodenticides.[300] EPA issues PIDs during the pesticide registration review process to present its proposed findings regarding the FIFRA registration standard and propose additional use restrictions if risk concerns are identified, among other things.[301] In the 2022 PIDs for anticoagulant rodenticides, EPA stated: "anticoagulant rodenticides do not meet the FIFRA registration standard without the changes to the affected registrations."[302] In other words, anticoagulant rodenticides may cause "unreasonable adverse effects on the environment."[303]

The 2022 PIDs identify numerous risks to both humans and nontarget wildlife, including federally protected species, that warrant additional restrictions.[304] Although the agency recognizes that the 2008 RMD reduced the potential for human health impacts from residential and consumer use of rodenticides, EPA found "that additional human health mitigation measures are necessary to further reduce the potential for human health exposures, including exposures to children."[305] Concerning impacts to wildlife, EPA reported that "it is apparent that the anticoagulant rodenticides may cause adverse effects on non-target organisms through primary and secondary consumption."[306]

To address these risks, the PIDs included additional restrictions "intended to reduce exposure to non-target organisms such as mammals and birds that may inadvertently consume rodenticides through their prey, or animals that may consume the rodenticide directly."[307] Specifically, the 2022 PIDs' proposed mitigation measures for rodenticides include:

(and not available in Maine or California)," writing in a Wirecutter article: "By all accounts it's extremely effective, offers very little chance of secondary poisoning (like if a dog ate a poisoned rat), and has an antidote in case something unfortunate did happen. It fit all of my criteria and cost me about $100." Ex. 75, Doug Mahoney, *How a Bag of Dead Rats Proved the Terro Garbage Guard Really Works* (Original), NY TIMES, (Feb. 8, 2024), https://web.archive.org/web/20240213072605/https:/www.nytimes.com/wirecutter/reviews/how-garbage-guard-really-works/. Shortly after, the editors issued a corrected version of the article that removed the author's reference to bromadiolone, writing: "An earlier version of this article incorrectly described the rodenticide, bromadiolone. In addition to rodents, it can be highly toxic to other mammals and wildlife." Ex. 76, Doug Mahoney, *How a Bag of Dead Rats Proved the Terro Garbage Guard Really Works* (Edited), NY TIMES, (Feb. 14, 2024), https://www.nytimes.com/wirecutter/reviews/how-garbage-guard-really-works/.

[298] Ex. 16, *Draft Ecological Risk Assessment for the Registration Review of Seven Anticoagulant Rodenticides*, *supra* note 88, at 6.

[299] *See* 87 Fed. Reg. 73,297.

[300] Ex. 77, Press Release, *EPA Proposes New Mitigation Measures for Rodenticides, Including Pilot for Protecting Endangered Species*, EPA (Nov. 29, 2022), https://www.epa.gov/pesticides/epa-proposes-new-mitigation-measures-rodenticides-including-pilot-protecting-endangered. The PIDs "describe EPA's rationales for conducting additional risk assessments for the registration review of [anticoagulant rodenticides] . . . as well as the Agency's subsequent risk findings and consideration of possible risk mitigation measures." 87 Fed. Reg. at 73,298.

[301] *Registration Review Process*, EPA, https://www.epa.gov/pesticide-reevaluation/registration-review-process#action (last visited Apr. 1, 2024).

[302] Ex. 73, *Proposed Interim Registration Review Decision for Seven Anticoagulant Rodenticides*, *supra* note 284, at 67.

[303] *Id.* at 67 n.43.

[304] *Id.* at 47.

[305] *Id.*

[306] *Id.* at 50.

[307] Ex. 77, Press Release, *EPA Proposes New Mitigation Measures for Rodenticides*, *supra* note 307.

- Reclassifying all SGAR products as Restricted Use Pesticides, as well as all FGAR products in packages exceeding four pounds.[308]
- Packing all FGARs in tamper-resistant, non-refillable bait stations for consumer use. These bait stations would contain no more than one pound of rodenticide products.[309]
- Adding Endangered Species Protection Bulletins to rodenticide labels and requiring users to follow measures included in those Bulletins.[310]
- Requiring follow-up search, collection, and disposal of carcasses to reduce secondary exposure of predators and scavengers. These follow-up measures would be applicable to both FGARs and SGARs.[311]

Additionally, to fulfill EPA's duty under the federal Endangered Species Act (ESA) to ensure that its actions are not likely to jeopardize the continued existence of any protected species or result in the destruction or adverse modification of their habitat,[312] EPA released a draft biological evaluation ("Draft BE") in 2023 addressing the impact of 11 rodenticides on federally listed Endangered and Threatened species.[313] The Draft BE's findings indicate that both FGARs and SGARs are likely to jeopardize the continued existence of 32 protected species of mammals, birds, and reptiles through current bait station application methods.[314]

Because anticoagulant rodenticides endanger ESA species, the Draft BE proposes additional mitigation measures (referred to as the "Rodenticide Strategy")[315] to minimize potential violations of the federal ESA. These supplemental measures include restrictions on bait station placement, prohibitions on use "in areas or at times of the year when [ESA-]listed secondary consumers might be exposed," and requirements to cover and monitor burrow holes after rodenticides are applied.[316]

Due to agency backlog, a final registration review decision may not be issued until late 2026,[317] making it particularly important for state agencies to act on their own to protect the environment in the meantime.

2. Massachusetts citizens are demanding greater restrictions on anticoagulant rodenticides.

Citizens in Massachusetts have expressed increasing concern about the environmental impacts of anticoagulant rodenticides, calling for lawmakers to take steps to restrict access to these harmful chemicals. For example, shortly after the death of beloved bald eagle MK from rodenticide

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[308] Ex. 12, *Rodenticides: Draft Biological Evaluation, supra* note 38, at 90; Ex. 73, *Proposed Interim Registration Review Decision for Seven Anticoagulant Rodenticides*, *supra* note 284, at 49.
[309] Ex. 12, *Rodenticides: Draft Biological Evaluation, supra* note 38, at 90.
[310] Ex. 73, *Proposed Interim Registration Review Decision for Seven Anticoagulant Rodenticides*, *supra* note 284, at 48.
[311] Ex. 12, *Rodenticides: Draft Biological Evaluation, supra* note 38, at 91.
[312] Ex. 78, Order Entering Stipulated Partial Settlement Agreement, *Ctr. For Biological Diversity v. EPA*, Case 3:11-cv-00293-JCS (N. Dist. Cal., Oct. 22, 2019), https://www.biologicaldiversity.org/campaigns/pesticides_reduction/pdfs/Pesticide-partial-settlement-w-order.pdf.
[313] Ex. 79, Press Release, *EPA Releases Draft Biological Evaluation of 11 Rodenticides' Effects on Endangered Species,* EPA (Dec. 1, 2023), https://www.epa.gov/pesticides/epa-releases-draft-biological-evaluation-11-rodenticides-effects-endangered-species.
[314] *See* Ex. 12, *Rodenticides: Draft Biological Evaluation, supra* note 38, at 60.
[315] *Id.* at 88, 89.
[316] *Id.* at 92–93.
[317] Press Release, *EPA Publishes Updated Registration Review Schedule*, EPA (Apr. 10, 2023), https://www.epa.gov/pesticides/epa-publishes-updated-registration-review-schedule.

poisoning, the town of Arlington voted to ban SGARs on town property.[318] Similarly, the town of Newbury recently passed a ban on SGARs on town-owned property.[319] Newbury citizens also have plans to submit a petition calling "for the Town of Newbury to provide education to its citizens and businesses on the hazards posed by SGARs and other poisons and alternatives to their use."[320] Additionally, in response to a citizen-led petition, the New England Aquarium has committed to stop using SGARs on its property.[321] Organizations such as MassAudubon and the MSPCA have also developed advocacy campaigns against these poisons.[322]

Several Massachusetts initiatives addressing anticoagulant rodenticides are now pending before Massachusetts state and local lawmakers. For example, though a citizen petition, the town of Lexington passed an Integrated Pest Management Resolution (Article 40) at its 2024 Annual Town Meeting by a vote of 157-1.[323] Among other things, the resolution bans the use of SGARs on town properties.[324] Arlington also submitted a Home Rule petition to the Massachusetts state legislature seeking permission for the town to regulate (and potentially ban) SGARs used on private property, which was reported favorably by the Joint Committee on Environment and Natural Resources on April 8.[325] The City of Newton has also submitted a Home Rule petition seeking permission to ban SGARs within its borders.[326]

At the state level, the loss of MK to anticoagulant rodenticide poisoning has renewed interest in H.825, also known as the "Hawkins Bill" after the bill's sponsor, Rep. Jim Hawkins.[327] The Hawkins Bill would require MDAR to keep electronic records of pesticide application data in a publicly available and searchable online portal.[328] Concerned that MDAR's current practice of maintaining paper records has prevented the state from fully understanding the environmental consequences of

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[318] Town of Arlington, Office of the Town Manager, *Policy: Use of Second Generation Anticoagulant Rodenticides* (effective Jan. 4, 2023), https://www.arlingtonma.gov/home/showpublisheddocument/63576/638091303462900000.

[319] Press Release, *Newbury Votes Unanimously to Ban Dangerous Rodent Poisons on Town-Owned Properties*, MASS AUDUBON (Feb. 1, 2024), https://www.massaudubon.org/news/press-room/2024/newbury-votes-unanimously-to-ban-dangerous-rodent-poisons-on-town-owned-properties.

[320] *Id.*

[321] Laura Kiesel, Petition Demanding that the New England Aquarium Stop Using SGARs, CARE2, https://www.thepetitionsite.com/224/174/139/demand-new-england-aquarium-stop-using-rat-poisons-killing-our-wildlife/ (last visited Mar. 26, 2024).

[322] *See A Campaign to Rescue Raptors*, MASSAUDUBON, https://www.massaudubon.org/take-action/advocate/rescue-raptors (last visited May 2, 2024); *Rodenticides*, MSPCA ANGELL, *supra* note 257.

[323] Town of Lexington, *2024 Annual Town Meeting Legal Postings, Actions, and Votes,* https://www.lexingtonma.gov/1949/2024-Annual-Town-Meeting-Legal-Postings- (last visited Apr. 26, 2024).

[324] Town of Lexington, Select Board, *2024 Annual Town Meeting Warrant* (Jan. 22, 2024), https://www.lexingtonma.gov/DocumentCenter/View/10687/To-Post---ATM-2024-FINAL-voted-warrant-signed-prevised-2524-105?bidId=.

[325] H.B. 804, 193rd Leg., Reg. Sess. (Mass. 2023), https://malegislature.gov/Bills/193/H804.

[326] S.B. 2448, 193rd Leg., Reg. Sess. (Mass. 2023), https://malegislature.gov/Bills/193/S2448.

[327] H.B. 825, 193rd Leg., Reg. Sess. (Mass. 2023), https://malegislature.gov/Bills/193/H825; Sam Doran, *Eagle's Death Renews Interest in Rodenticide Bill*, WWLP (Mar. 8, 2023), https://www.wwlp.com/news/state-politics/eagles-death-renews-interest-in-rodenticide-bill/. An earlier version of the Hawkins Bill was nearly passed last year but failed to reach the final enactment vote before the end of the term. *See* H.B. 4931, 192nd Leg., Reg. Sess. (Mass. 2022), https://malegislature.gov/Bills/192/H4931. With reinvigorated public support following MK's death, the refiled Hawkins Bill has since been referred to the House Ways and Means Committee. *See* H.B. 825, *supra.*

[328] Doran, *supra* note 327.

using anticoagulant rodenticides,[329] Rep. Hawkins believes the bill would help make data available that could "be the basis for a ban" on SGARs.[330]

Over 30 organizations have expressed support for the Hawkins Bill, including groups such as the New England Wildlife Center and the Animal Legal Defense Fund.[331] Notably, the Hawkins Bill has received intergenerational support from Massachusetts residents, with 11-year-old members of the Billerica Girl Scouts releasing a video urging the Senate to enact the law.[332]

3. California has already banned FGARs and SGARs due to their significant adverse effects on non-target wildlife in California.

Massachusettsans' efforts have been inspired in part by the progress made in California on this issue. The most populous U.S. state has placed a moratorium on the use of rodenticide products containing SGARs and the FGAR diphacinone.[333]

In 2013, the California Department of Pesticide Regulation (CDPR) determined that the use of SGARs presented "unmitigated risks related to persistent residues in target animals," which impacted non-target wildlife.[334] CDPR then designated the SGARs brodifacoum, bromadiolone, difenacoum, and difethialone as "California restricted materials."[335] Furthermore, also in 2014, the California state legislature enacted AB 2657, which prohibited the use of SGARs in "wildlife habitat area[s]" except when used for agricultural activities.[336]

Despite these restrictions, a 2018 CDPR analysis of 11 studies revealed that most mountain lions, bobcats, and protected Pacific fishers tested in the state were exposed to anticoagulant rodenticides. As a result of regulatory advocacy and legal action commenced by Raptors are the Solution and Project Coyote, CDPR commenced reevaluation of SGARs in 2018.[337] Based on its preliminary investigation, CDPR determined that "a significant adverse impact [to non-target wildlife] has occurred or is likely to occur from the use of SGARs."[338] Furthermore, CDPR found that while its 2014 restricted use regulations "changed SGAR use patterns by restricting their purchase, sale, and use, reported rates of non-target wildlife exposure to SGARs have not decreased."[339] This

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[329] Ex. 41, Pitts, *supra* note 191.
[330] Doran, *supra* note 327.
[331] *Id.*
[332] *See* Billerica Girl Scouts, *Troop 82394 speaks to the Senate to Pass Rodenticide Legislation*, YOUTUBE (Jun. 18, 2023) https://www.youtube.com/watch?v=XHUjOU2xJRk.
[333] *See* California Ecosystems Protection Act of 2023, CAL. AGRIC. CODE. § 12978.7 (Deerling 2024) (as amended by 2023 Cal. Stat. ch. 836, § 2 (2023)).
[334] Ex. 80, Cal. Dep't of Pesticide Regul., *An Investigation of Anticoagulant Rodenticide Data Submitted to the Department of Pesticide Regulation* 1 (Nov. 16, 2018), https://www.cdpr.ca.gov/docs/registration/reevaluation/2018_investigation_anticoagulant.pdf.
[335] *Id.*
[336] Cal. A.B. 2657, 2014 Cal. Stat. ch. 475, § 1 (2015) (codified, as amended, at CAL. AGRIC. CODE § 12978.7 (Deerling 2024)).
[337] Earth Island, *Protecting Raptors, and Other Wildlife, from Lethal Rodenticides*, https://www.earthisland.org/index.php/advocates/suit/protecting-raptors-from-rodenticides (last visited Mar. 26, 2024).
[338] Ex. 81, Cal. Dep't of Pesticide Regul., *Notice of Proposed Decision to Begin Reevaluation of Second-Generation Anticoagulant Rodenticides and Public Report* 2 (Nov. 16, 2018), https://www.cdpr.ca.gov/docs/registration/canot/2018/ca2018-22.pdf.
[339] *Id.*

reevaluation is still underway, and in 2020, the state's legislature adopted AB 1788, which prohibits the use of SGARs statewide until the reevaluation is complete.[340]

Since then, however, wildlife exposures to anticoagulant rodenticides have continued. For example, in 2022, a pregnant female mountain lion who was struck and killed by a vehicle near the Santa Monica Mountains tested positive for anticoagulant rodenticides.[341] A necropsy conducted by the California Animal Health and Food Safety Lab confirmed that the five year-old mountain lion and all four of her unborn kittens had been exposed to SGARs and the FGAR diphacinone,[342] suggesting to many that greater restrictions were needed to protect California's wildlife.[343]

Recently, legal action has prompted CDPR to reevaluate diphacinone in addition to the four SGARs.[344] CDPR has since announced its preliminary finding that "a significant adverse impact to non-target wildlife has occurred or is likely to occur from the use of diphacinone."[345] While CDPR's reevaluation is still ongoing, the California legislature passed AB 1322 in October 2023, which extends the state's 2020 moratorium on second-generation anticoagulant rodenticides to include diphacinone as well.[346]

V. The Subcommittee does not appear to be monitoring the adverse impacts of anticoagulant rodenticides on wildlife in Massachusetts.

The Subcommittee is required to initiate an individualized review of any pesticides it believes may cause unreasonable adverse effects to the environment.[347] However, to determine whether pesticides may cause unreasonable adverse effects to the environment, the Subcommittee must track the environmental impact of those pesticides. Without sufficient data on the environmental impacts of FGARs and SGARs, the Subcommittee "has no real idea whether [anticoagulant rodenticides] will cause unreasonable adverse effects" as prohibited by the MPCA.[348]

Pesticide applicators are required to keep certain operational records, and MDAR may require reporting of that information on an annual basis.[349] "As a minimum," MDAR requires annual submittal of "[a]ccidents or incidents resulting from use of a pesticide which caused pollution," and

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340 California Ecosystems Protection Act of 2020, Cal. A.B. 1788, 2020 Cal. Stat. ch. 250, § 2 (2021) (amending CAL. AGRIC. CODE. § 12978.7 (Deerling 2024)).

341 Ex. 82, News Release, *Adult Female Mountain Lion P-54 and Her Four Full-Term Fetuses Were Exposed to Multiple Anticoagulant Rodenticides*, NPS (Sept. 7, 2022), https://www.nps.gov/samo/learn/news/adult-female-mountain-lion-p-54-and-her-four-full-term-fetuses-were-exposed-to-multiple-anticoagulant-rodenticides.htm.

342 *Id.*

343 Press Release, *California Bill to Expand Community, Wildlife Protections Against Rat Poisons*, CTR. FOR BIOLOGICAL DIVERSITY (Mar. 20, 2023), https://biologicaldiversity.org/w/news/press-releases/california-bill-to-expand-community-wildlife-protections-against-rat-poisons-2023-03-20/.

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Ex. 83, Cal. Dep't of Pesticide Regul., *Notice of Final Decision to Begin Reevaluation of Diphacinone* 2 (Oct. 3, 2023), https://www.cdpr.ca.gov/docs/registration/canot/2023/ca2023-11.pdf; *Raptors Are the Sol. v. Superior Ct. of Alameda Cnty.*, No. A161787, 2022 WL 4480919, at *1 (Cal. Ct. App. Sept. 27, 2022).

345 Ex. 83, Cal. Dep't of Pesticide Regul., *Notice of Final Decision to Begin Reevaluation of Diphacinone*, supra note 344.

346 California Ecosystems Protection Act of 2023, *supra* note 333.

347 333 Code Mass. Regs. § 8.03(1).

348 *Pollinator Stewardship Council*, 806 F.3d at 532 ("Without sufficient data, the EPA has no real idea whether [a pesticide] will cause unreasonable adverse effects . . . as prohibited by FIFRA."); *accord* Mass. Off. of the Att'y General, et al., *supra* note 66, at n.94 at 18.

349 G.L. c. 132B, § 10(d).

"[a]ny illnesses or injuries caused by or suspected to have been caused by pesticides and reported to the applicator."[350]

However, as a practical matter, it is very difficult for pesticide applicators to track accidents, incidents, illnesses, or injuries involving anticoagulant poisonings—particularly those involving wildlife—because those impacts are usually distant in space and time from the pesticide application itself. For example, because is impossible to know which applicator(s) set out the bait that poisoned the rodents that ultimately killed MK, it is impossible for the responsible pesticide applicator to report her death.

Given the infeasibility of accurately collecting this data, it is unlikely that pesticide applicators' annual reports submitted to MDAR are adequately documenting anticoagulant rodenticides' wildlife impacts. However, even if pesticide applicators are submitting this data to MDAR, Petitioners have serious doubts that the agency is effectively using this data. If Petitioners are correct, the Subcommittee has been registering pesticides without capably assessing whether they have unreasonable adverse effects on the environment.

In November 2023, the Harvard Animal Law & Policy Clinic (ALPC) submitted a public records request to MDAR seeking records of complaints, investigations, and enforcement actions related to certain rodenticides for the last two years. ALPC also requested reports of "[a]ccidents or incidents resulting from use of a pesticide which caused pollution," or "[a]ny illnesses or injuries caused by or suspected to have been caused by pesticides and reported to the applicator."[351] MDAR is obligated to collect this data under 333 Code Mass. Regs. § 10.14(3)–(4).

However, the ALPC was unable to obtain these records because MDAR estimated that it would take nearly 474 hours to search and compile these records (at a cost of $11,750).[352] In an email on November 22, 2023, the records access officer explained:

> MDAR does not maintain pesticide records in a way where searching records by pesticide type, such as rodenticides, is possible. This is due to the fact that inspection report files are not kept in a database but rather stand-alone documents. MDAR does not collate data related to rodenticides in the form of statistics or summary data. Additionally, complaints are received over the phone, so per the good faith estimate letter, MDAR would have to go through the inspection report files in order to find complaints and determine which ones were related to rodenticides.[353]

Given that it would take a full-time employee approximately 12 weeks just to gather MDAR's records on the subject, it seems unlikely that the Subcommittee is using annual reports to track data or statistics on the environmental impacts of anticoagulant rodenticides. Therefore, the Subcommittee can't possibly be carrying out its duties to assess the environmental impacts of rodenticides as required under the MPCA. There is also little doubt that the Subcommittee has also failed to carry out its duties under MESA to "use all practicable means and measures to avoid or minimize damage" to protected species.[354]

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[350] 333 Code Mass. Regs. §§ 10.14(1), 10.14(3).

[351] Ex. 84, Public Records Request from Rachel Mathews, Harvard Law School Animal Law & Policy Clinic, to Raquel Loayza, MDAR (Nov. 3, 2023).

[352] Ex. 84, Response to Public Records Request from Raquel Loayza, MDAR, to Rachel Mathews, Harvard Law School Animal Law & Policy Clinic (Nov. 20, 2023).

[353] *Id.* (emphasis added).

[354] 321 Code Mass. Regs. § 10.05(1).

VI. The Subcommittee should immediately suspend—and ultimately revoke—the registrations for all anticoagulant rodenticide products used in Massachusetts.

The Subcommittee has the authority to suspend pesticide registrations "at any time" if it concludes that anticoagulant rodenticides may cause unreasonable adverse effects on the environment.[355] In light of the substantial evidence that SGARs and FGARs poison the food web and kill Massachusetts wildlife—including eagles, hawks, owls, foxes, and more—the Subcommittee should take a precautionary approach to minimize potential adverse impacts on human health, protected species, and the environment.[356] Thus, the Subcommittee should immediately suspend registrations for all products containing the active ingredients brodifacoum, bromadiolone, difenacoum, difethialone, warfarin, chlorophacinone, and diphacinone and initiate an individual review of each active ingredient.

Furthermore, upon conducting an assessment of the environmental impacts of these anticoagulant rodenticides, the Subcommittee will likely find that they may and do cause unreasonable adverse effects on the environment. The documented impacts of anticoagulant rodenticides warrant this finding under the criteria Massachusetts itself has applied to its determination that neonicotinoids do not meet the FIFRA standard for registration (see below).

In 2018, the Office of then- Massachusetts Attorney General (AG) Maura Healey—along with the Attorneys General of Hawaii, Maryland, and the District of Columbia—commented on EPA's review of its FIFRA registrations for four neonicotinoid insecticides, urging the agency to "severely cancel or restrict uses" of those insecticides.[357] The AGs argued that EPA "cannot support a finding under FIFRA that continued extensive use of [neonicotinoids] 'will not generally cause unreasonable adverse effects on the environment'" because:

> Neonicotinoid Insecticides are known to be highly toxic to bees and other pollinators, contributing to potentially catastrophic pollinator losses that threaten our states' agricultural economies, the health and welfare of our residents, and the food supply. In addition, these insecticides are harmful to fish, amphibians, birds, bats, aquatic invertebrates, and other wildlife. They threaten the health of our lakes, streams, and rivers, while also posing risks to human health.[358]

The AGs also emphasized "a litany of actions by states, retailers, citizen groups, and other countries around the world to limit neonicotinoid insecticide use and mitigate associated environmental harms."[359]

As with neonicotinoids, it is clear that anticoagulant rodenticides pose an unreasonable adverse risk to the environment. Anticoagulant rodenticides are highly toxic to mammals and birds, especially vulnerable birds of prey. They threaten the health of protected species in violation of state and federal law. Anticoagulant rodenticides have been responsible for multiple catastrophic, high-profile deaths of bald eagles, red-tailed hawks, and other beloved animals in Massachusetts. The devastating effects of anticoagulant rodenticides, particularly SGARs, have spurred local protests and motivated

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[355] 333 Code Mass. Regs. § 8.07.

[356] *Cf.* Mass. Off. of the Att'y General, et al., *supra* note 66, at 17–18 (arguing that EPA should "[t]ake a [p]recautionary [a]pproach" by restricting neonicotinoid insecticide use in light of the "[e]vidence of [p]otential [s]erious [r]isks to [h]uman [h]ealth").

[357] *See generally* Mass. Off. of the Att'y General, et al., *supra* note 66.

[358] *Id.* at 3.

[359] *Id.*

state legislators to sponsor bills in response. Anticoagulant rodenticides also pose a risk to human health, particularly children, and current regulations have been insufficient to prevent human exposure.

Furthermore, many of the harms to wildlife caused by anticoagulant rodenticides cannot be effectively addressed by existing mitigation measures such as tamper-proof bait boxes because it is not access to the poison itself that causes the problem but rather the poison's very mechanism of action: the delayed death of rodents who ingest the poison over several days. Indeed, evidence demonstrates that secondary poisonings of birds persist under present regulations: according to a 2020 study from the Tufts Wildlife Clinic, despite mitigation efforts adopted by the EPA in 2008 (discussed in Section IV.F.1 above), Massachusetts birds of prey showed *higher* rates of anticoagulant rodenticide exposure from 2017 to 2019 than during study periods prior to when the regulations went into effect. Anticoagulant rodenticides thus impose unreasonable adverse effects on the environment because, in contrast to other means of rodent control, these poisons operate in a manner that effectively guarantees that harms to non-target wildlife will regularly occur.

Given the unreasonable adverse impacts that anticoagulant rodenticides have on the environment and because many such impacts are inherent to the use of anticoagulant rodenticides, Petitioners request that the Subcommittee *immediately* suspend the registrations of all anticoagulant rodenticide products registered in Massachusetts, conduct an individual review of their active ingredients, and deny all future registration of anticoagulant rodenticides until these individual reviews are complete.[360] Alternatively, if the Subcommittee does not initiate *immediate* individual reviews of all anticoagulant rodenticides, the Subcommittee should decline to re-register all existing registrations after they expire on June 30, 2024.[361] At that time, the Subcommittee must determine whether anticoagulant rodenticides meet the MPCA standard for re-registration and decline to re-register any pesticide products that may cause unreasonable adverse effects on the environment.[362] As discussed previously, anticoagulant rodenticides do not meet this standard.

In addition to the data and exhibits referenced in or attached to this petition, the Subcommittee may require further information on the environmental injuries and risks associated with anticoagulant rodenticides. To the extent that more information is needed, MDAR has the authority and legal obligation to fill the relevant data gaps when conducting its individual reviews under G.L. c. 132B, §§ 7, 12.[363]

VII. If MDAR does not take the petitioned action and instead re-registers anticoagulant rodenticide products in Massachusetts, they should be reclassified for State Restricted Use under G.L. c. 132B, § 7.

Although EPA's current proposal, as described in the 2022 PIDs,[364] includes reclassifying anticoagulant rodenticides for restricted use, revoking all registrations for pesticide products containing FGARs and SGARs is the only solution to safeguard Massachusetts' delicate wildlife. Reclassifying anticoagulant rodenticides for restricted use is insufficient because of the inherent nature of these chemicals, i.e., their capacity to exterminate rodents over an extended period and

[360] *See* G.L. c. 132B, § 7; 333 Code Mass. Regs. § 8.03.
[361] 333 Code Mass. Regs. § 8.05(2)(c).
[362] G.L. c. 132B, § 7.
[363] *See also* 333 Code Mass. Regs. § 8.02; *id.* § 8.03; *id.* § 10.14.
[364] *See* Ex. 73, *Proposed Interim Registration Review Decision for Seven Anticoagulant Rodenticides*, *supra* note 284, at 49–50.

bioaccumulate in rodents' natural predator species.[365] Whenever anticoagulant rodenticides are found in rodents, they may inadvertently poison the food chain, thereby endangering raptors and other wildlife dependent on these prey species. Thus, the use of anticoagulant rodenticides poses an interminable threat to raptors and other wildlife, even if they are applied only by an appropriately certified private or commercial applicator.

However, if after conducting individual reviews the Subcommittee opts against revoking registrations, reclassifying rodenticides for restricted use could serve as a partial—albeit insufficient—mitigation strategy. The extent to which this measure would curtail the overall volume of rodenticides employed within the state is not clear, although it would limit private individuals' access to these pesticides. Moreover, this measure would fail to rectify the underlying ecological harm inflicted by these lethal substances when they are applied—as long as rats and mice can consume rodenticides, their natural predators will be impacted. Therefore, while restricting access to FGARs and SGARs is a step in the right direction, the ultimate imperative remains their complete prohibition to safeguard Massachusetts' wildlife.

The Subcommittee is authorized to—and regularly does—reclassify general use pesticides for State Restricted Use only.[366] For example, in 2023, the Subcommittee unanimously moved to reclassify five neonicotinoid products from general to state-restricted use.[367] In doing so, the Subcommittee concluded that neonicotinoids "may pose unreasonable adverse effects to the environment as well as pollinators."[368]

In reaching this conclusion, the Subcommittee relied on a variety of factors including:

- Current use patterns of the pesticide in Massachusetts;[369]
- Common methods of application;[370]
- Toxicity and other health effects on humans and/or nontarget species;[371]
- Implications of the pesticide's use under federal and state environmental law;[372]
- Reliable studies conducted on demonstrated effects of the pesticide on wildlife, humans and other animals;[373]

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[365] For example, California authorities found that classifying SGARs as "restricted use" "changed SGAR use patterns by restricting their purchase, sale, and use, [but] reported rates of non-target wildlife exposure to SGARs have not decreased." Ex. 81,Cal. Dep't of Pesticide Regul., *Notice of Proposed Decision to Begin Reevaluation of Second-Generation Anticoagulant Rodenticides*, *supra* note 338.

[366] G.L. c. 132B, § 7; MDAR, *Register a Pesticide Product in Massachusetts*, *supra* note 42 ("The State may impose additional restrictions on pesticide product registrations for product use in Massachusetts. Such additional restrictions may include reclassification from general use to State Restricted Use. Such reclassification is routinely done for products containing chemicals on the Department's Groundwater Protection List.").

[367] MDAR, *Pesticide Board Subcommittee Meeting Minutes*, at 2–3 (Sept. 19, 2023), https://www.mass.gov/doc/minutes-for-september-19-2023/download. *See Massachusetts State Restricted Use Products*, *supra* note 53; MDAR, *List of Neonicotinoid Pesticides*, MASS.GOV, https://www.mass.gov/doc/list-of-neonicotinoid-pesticides (last visited Mar. 4, 2024).

[368] *Pesticide Board Subcommittee Meeting Minutes*, *supra* note 367, at 2–3.

[369] MDAR Summary of Neonicotinoids for Massachusetts, at 2 (Feb. 10, 2021), https://www.mass.gov/doc/mdar-summary-of-neonicitinoids-for-massachusetts/download.

[370] *Id.* at 4.

[371] *Id.*

[372] MDAR, *Register a Pesticide Product in Massachusetts*, *supra* note 42 ("Pesticide Program staff review every pesticide product registration application for compliance with Federal and State laws and regulations.").

[373] Memorandum from Alexandra van Geel et al., Industrial Economics, Inc., to Hotze Wijnja et al., Mass. Dep't of Agric. Res. (Dec. 2019), https://www.mass.gov/doc/iec-pesticide-literature-compilation-and-results-memorandum.

- Prevalence in the environment;[374]
- Actions taken by other state and local authorities;[375] and
- EPA risk assessment documents and decisions.[376]

Thus, when conducting individual reviews of FGARs and SGARs, the Subcommittee should consider any sources providing insight on the implications of anticoagulant rodenticides on the above factors, as well as the data and exhibits referenced in and attached to this petition.[377] As discussed in great detail in Part IV, it is clear that these factors weigh in favor not only of reclassifying anticoagulant rodenticides for restricted use but also of suspending and/or revoking their registrations because they may generally cause unreasonable adverse effects to the environment.

VIII. Conclusion

Petitioners respectfully request that the Subcommittee suspend, review—and ultimately revoke—all existing registrations of pesticide products containing the active ingredients brodifacoum, bromadiolone, difenacoum, difethialone, warfarin, chlorophacinone, and diphacinone. Additionally, the Subcommittee should decline to register any other anticoagulant rodenticide products until the individual review process is complete. For the foregoing reasons, Petitioners' request is based on the wealth of evidence that these chemicals pose unreasonable adverse effects on the environment and is consistent with the Subcommittee's obligations under the MPCA, MESA, and accompanying regulations.

[374] MDAR Summary of Neonicotinoids for Massachusetts, *supra* note 369, at 7–9.
[375] *Id.* at 9–10.
[376] *See, generally,* Summary of EPA Registration Review of Neonicotinoids, *supra* note 64.
[377] To the extent that more information is needed to determine the extent of the impact of anticoagulant rodenticides on human health and the environment based on actual use in Massachusetts, that data must be collected as part of the registration review process. *See* discussion *infra* §§ III.B, VI.

EXHIBIT LIST

Ex. 1 Maureen Murray, *Anticoagulant Rodenticide Exposure and Toxicosis in Four Species of Birds of Prey in Massachusetts*, 26 ECOTOXICOLOGY 1041 (2017).

Ex. 2 Laurel E. K. Serieys et al., *Widespread Anticoagulant Poison Exposure is Linked with Immune Dysregulation and Severe Notoedric Mange in Urban Bobcats*, 28 PROCS. OF THE VERTEBRATE PEST CONF. 258 (2018).

Ex. 3 Spreadsheet of data derived from MDAR, *Annual Pesticide Use Information (2022)*, MASS.GOV, https://www.mass.gov/info-details/annual-pesticide-use-information.

Ex. 4 Heather McCarron, *A bald eagle, gone too soon. Wildlife center reports death of MK*, CAPE COD TIMES (Mar. 2, 2023), https://www.capecodtimes.com/story/news/local/2023/03/01/eagle-from-mystic-river-watershed-dies-of-what-experts-call-rat-poison/69958896007/.

Ex. 5 Social Media Posts Documenting Confirmed and Suspected Anticoagulant Rodenticide Exposure Incidents in Massachusetts.

Ex. 6 Michael Rosenfield, *Rescuers Capture Bald Eagle Believed to Be Critically Sickened by Rat Poison*, NBC BOSTON (Feb. 27, 2023), https://www.nbcboston.com/news/local/rescuers-capture-bald-eagle-believed-to-be-critically-sickened-by-rat-poison/2984053/.

Ex. 7 Laura Kiesel, *Special Feature: More Potent Than Rodents*, DIGBOSTON (May 31, 2018), https://digboston.com/special-feature-more-potent-than-rodents/.

Ex. 8 Laura Kiesel, *Rodenticides are Killing Animals Way Up the Food Chain*, SALON (Dec. 26, 2021), https://www.salon.com/2021/12/26/rodenticides-sgars-unsafe_partner/.

Ex. 9, Anjali Huynh, *In Arlington, Dead Owls Spark Grief, Raise Poison Concern*, BOSTON GLOBE (June 17, 2022).

Ex. 10 Save Arlington's Wildlife, https://savearlingtonwildlife.org/2023/02/09/save-arlingtons-wildlife/.

Ex. 11 EPA, *Revised Risk Mitigation Decision for Ten Rodenticides* (June 24, 2008), https://www.regulations.gov/document/EPA-HQ-OPP-2006-0955-0764.

Ex. 12 EPA, *Rodenticides: Draft Biological Evaluation, Effects Determinations, and Mitigation Strategy for Federally Listed and Proposed Endangered and Threatened Species and Designated and Proposed Critical Habitats* (Nov. 28, 2023), https://www.regulations.gov/document/EPA-HQ-OPP-2023-0567-0004.

Ex. 13 Spreadsheet of Rodenticides Registered in Mass. (Mar. 26, 2024).

Ex. 14 EPA, *Potential Risks of Nine Rodenticides to Birds and Nontarget Mammals: a Comparative Approach* (July 2004), https://www.regulations.gov/document/EPA-HQ-OPP-2006-0955-0005.

Ex. 15 C.F. McGee et al., *Anticoagulant rodenticides and resistance development in rodent pest species – A comprehensive review,* 88 J. OF STORED PRODS. RSCH. (2020), https://doi.org/10.1016/j.jspr.2020.101688.

Ex. 16 EPA, *Draft Ecological Risk Assessment for the Registration Review of Seven Anticoagulant Rodenticides* (Mar. 17, 2020), https://www.regulations.gov/document/EPA-HQ-OPP-2015-0778-0034.

Ex. 17 Letter from Gene Benbow, Product Manager, EPA Office of Pesticide Program to Jennifer Klika, Regulatory Affairs Manager, Bell Laboratories, Inc. app (CONTRAC All-Weather Blox Approved Labeling) (Feb. 13, 2020), https://www3.epa.gov/pesticides/chem_search/ppls/012455-00079-20200213.pdf

Ex. 18 Jennifer Taylor, Animal Care Coordinator, *Rodenticide: Some Squirrels Survived*, WILD CARE OF CAPE COD, https://www.wildcarecapecod.org/rodenticide-some-squirrels-survived/.

Ex. 19 Shouta M. M. Nakayama et al., *Avian interspecific differences in VKOR activity and inhibition: Insights from amino acid sequence and mRNA expression ratio of VKORC1 and VKORC1L1*, 228 COMPAR. BIOCHEMISTRY & PHYSIOLOGY 108635 (Feb. 2020).

Ex. 20 NYS Wildlife Health Program, *Rodenticide Toxicity*, Cornell Wildlife Health Lab (2018), https://cwhl.vet.cornell.edu/system/files/public/cwhl-fact-sheetsrodenticide.pdf.

Ex. 21 E. Martin Caravati et al.., *Long-acting anticoagulant rodenticide poisoning: An evidence-based consensus guideline for out-of-hospital management*, 45 Clinical Toxicology 1 (2007), https://doi.org/10.1080/15563650600795487.

Ex. 22 Mass. Div. of Fisheries & Wildlife, *First Bald Eagle Death in Massachusetts from Rodenticides Confirmed*, MASS.GOV (May 2, 2021), https://www.mass.gov/news/first-bald-eagle-death-in-massachusetts-from-rodenticides-confirmed.

Ex. 23 Mass. Div. of Fisheries & Wildlife, *Eaglet Dies from Rodenticide Poisoning*, MASS.GOV (Aug. 11, 2021), https://www.mass.gov/news/eaglet-dies-from-rodenticide-poisoning.

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