Wildlife Exposure to Rodenticides

- AR's interfere with vitamin K mediated synthesis of blood clotting factors in the liver
- May suppress reproductive capacity or immune function, increase vulnerability to co-morbidity factors such as parasites, disease, and predators
- Together with other pressures acting on wildlife populations, AR exposure may post an important challenge for maintaining healthy populations
- Lethal concentrations can vary widely within and among species, can't attempt to relate concentrations to survival

SOURCE: Trapper-derived carcasses

Year	Species Tested	Number Tested	Results
2018-19	Fisher	30	All had at least one or more compound exposure
2020-21	Fisher	30	All had at least one or more compound exposure
2021-22	Fisher	11	All had at least one or more compound exposure
	Bobcat	29	21 tested positive for one or more compound

SOURCE: Trapper-derived carcasses

	Year	Sample Size	Brodifacoum	Bromadiolone	Chlorophacinone	Difethialone	Difenacoum	Dipacinone	Dicoumarol	Warafin
FISHER	2018-19	30	26	13	6	4		29		
	2020-21	30	23	13	1	6	20	27		
	2021-22	11	10	9				8	3	
	TOTAL	**71**	**83%**	**49%**	**10%**	**14%**	**28%**	**90%**	**4%**	**0%**
BOBCAT	2020-21	29	14	6				14	1	1
	TOTAL	**29**	**48%**	**21%**	**0%**	**0%**	**0%**	**48%**	**3%**	**3%**

Exposure to one or more compounds suggest multiple exposure times

Drivers of anticoagulant rodenticide exposure in fishers (*Pekania pennanti*) across the northeastern United States

Georgianna Silveira[1*] Jacqueline L. Frair[1] Lisa Murphy[2] Julie C. Ellis[3]
David Needle[4] Stephanie A. Cunningham[1†] Amanda Watson[5]
Aaron Facka[6†] Patrick Tate[7] Shevenell Webb[8] Kim Royar[9]
Chris Bernier[9] Thomas Keller[10] Krysten Schuler[11]

[1] Department of Environmental Biology, State University of New York, College of Environmental Science and Forestry, Syracuse, NY, United States
[2] Pennsylvania Animal Diagnostic Laboratory System New Bolton Center, Department of Pathobiology, University of Pennsylvania School of Veterinary Medicine, Kennett Square, PA, United States
[3] Wildlife Futures Program, Department of Pathobiology, University of Pennsylvania School of Veterinary Medicine, Kennett Square, PA, United States
[4] New Hampshire Veterinary Diagnostic Laboratory, Department of Molecular, Cellular, and Biomedical Sciences, University of New Hampshire, Durham, NH, United States
[5] Department of Environmental Conservation, State of New York, Albany, NY, United States

High prevalence of anticoagulant rodenticide exposure in New England Fishers (Pekania pennanti)

Jacqueline Y Buckley [1], David B Needle [2], Kimberly Royar [3], Walter Cottrell [3], Patrick Tate [4], Christopher Whittier [5]

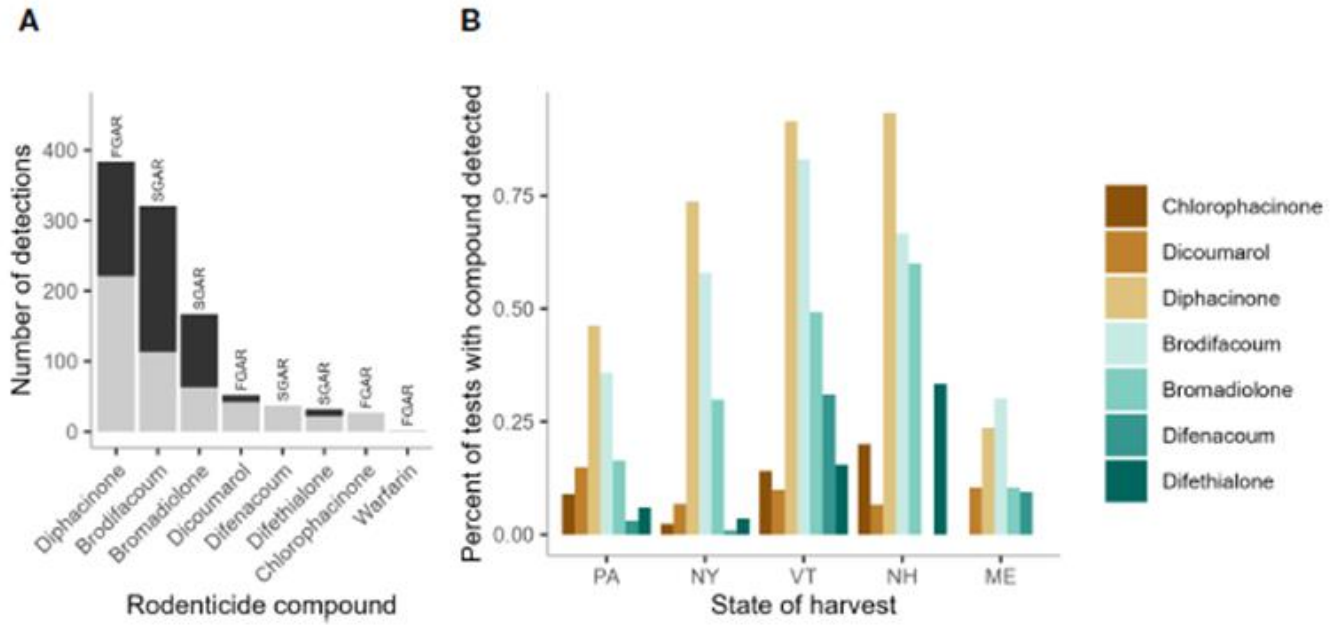


FIGURE 1

Summary of anticoagulant rodenticides (AR) in 597 fisher livers collected in the northeastern United States, 2018–2022. Count of AR detections (N=1,010) by compound with trace (gray bars) versus quantifiable levels (black bars) **(A)**, and the percent of fishers testing positive for individual AR compounds in in each state: Pennsylvania (PA), New York (NY), Vermont (VT), New Hampshire (NH), and Maine (ME) **(B)**, with first-generation ARs (FGARs) in shades of brown, and second-generation ARs (SGARs) in shades of green. Two detections of the FGAR warfarin, both in NY, were not included for clarity.

Silveira et al. 2024

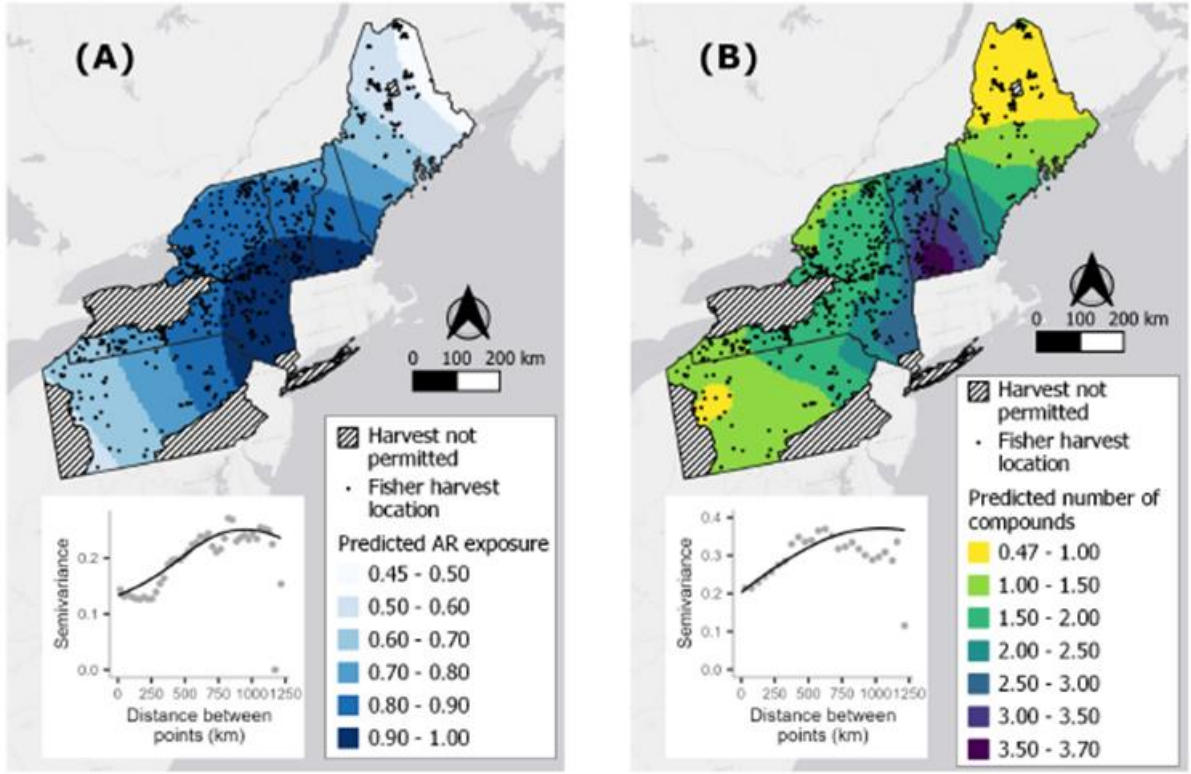
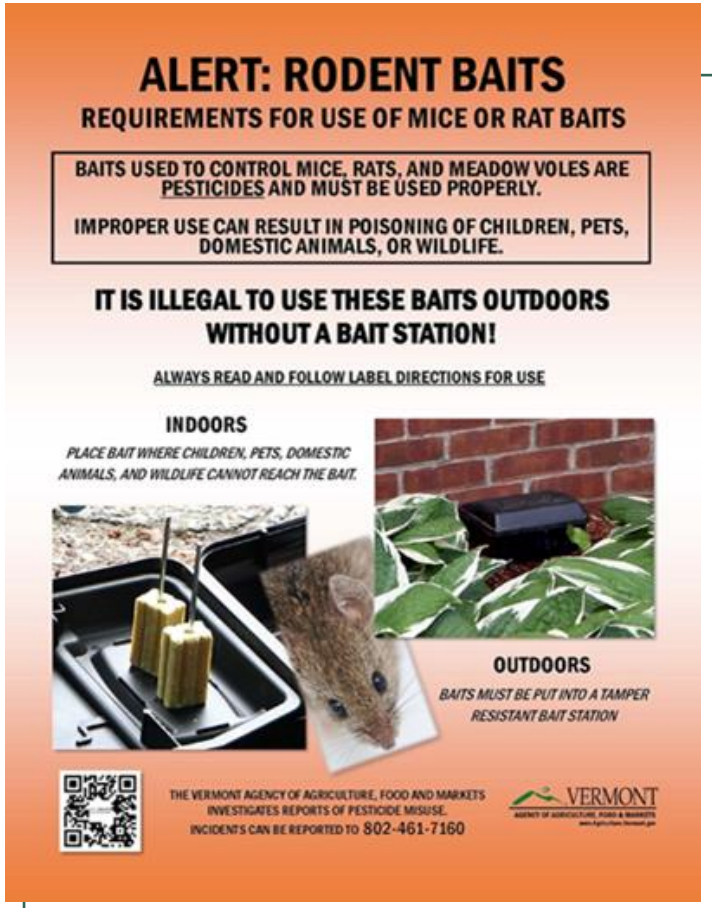


FIGURE 3
Averaged kriging predictions for the probability of fisher exposure to at least one anticoagulant rodenticide (AR) compound **(A)** and the predicted number of compounds detected per fisher **(B)** based on 597 fisher livers collected in the northeastern United States from 2018–2022. One of 10 imputed sets of sample locations underlying these maps (black dots), state boundaries, and map inserts of one example semivariogram used to make kriging reductions.

Silveira et al. 2024

- How long has this been going on for?
- Does exposure mean there's an impact?
- How do different species, ages, and sexes metabolize the compounds?
- How to study this? Good question!

- Mandatory collection of bobcat and fisher carcasses
- Are there testing alternatives?
- Trapping data gives us a window into looking more into secondary reproductive impacts
- Population level impacts not detected



- Larger NE Health Study
- Long-term Monitoring
- Task Force for Reducing Exposure

P*A*D*L*S
PENNSYLVANIA ANIMAL DIAGNOSTIC LABORATORY SYSTEM
THREE INSTITUTIONS ONE LABORATORY

University of New Hampshire
NH Veterinary Diagnostic Laboratory

NORTHEAST ASSOCIATION OF FISH AND WILDLIFE AGENCIES

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
www.Agriculture.Vermont.gov

VERMONT FISH & WILDLIFE


VERMONT
FISH & WILDLIFE