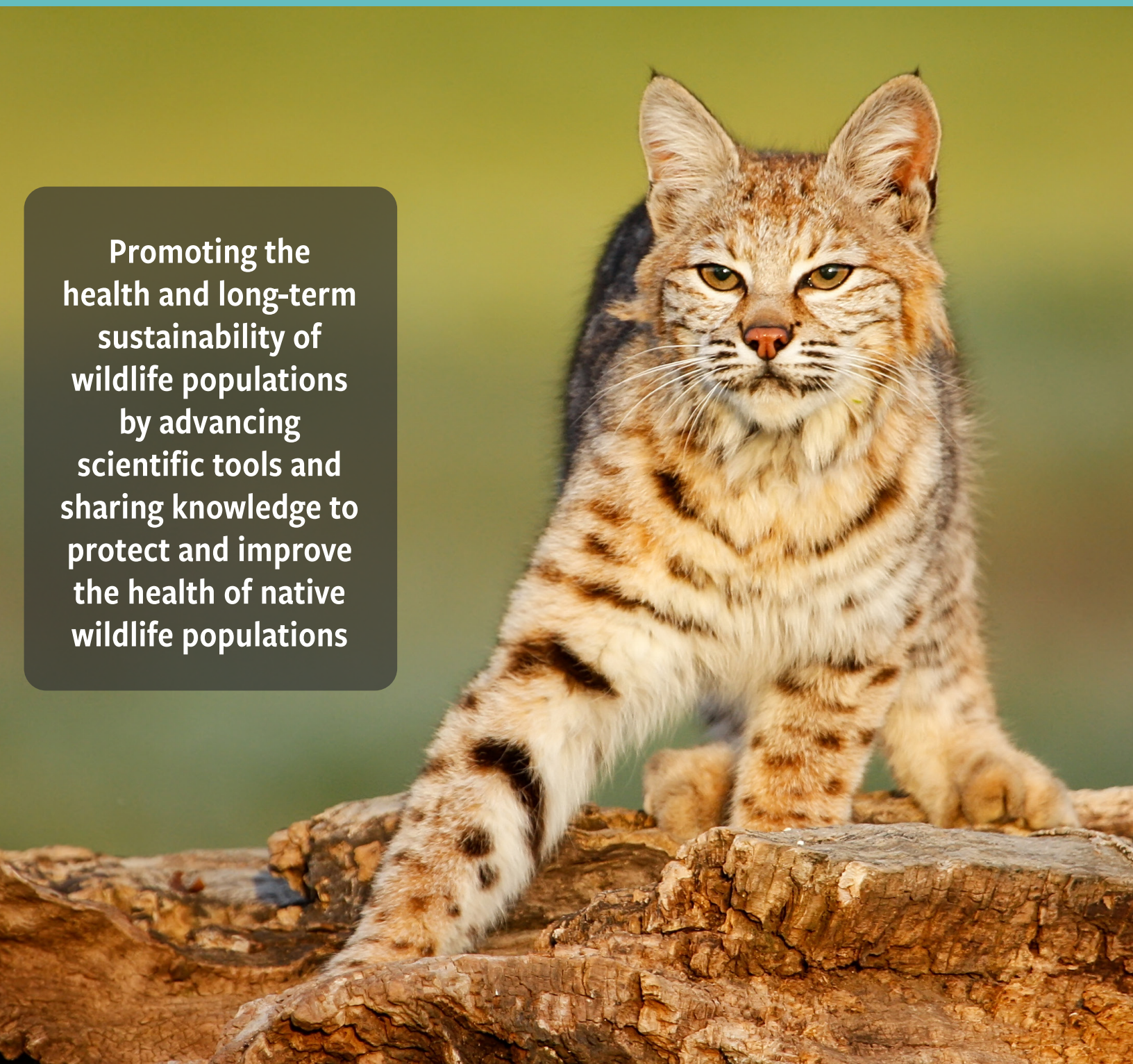
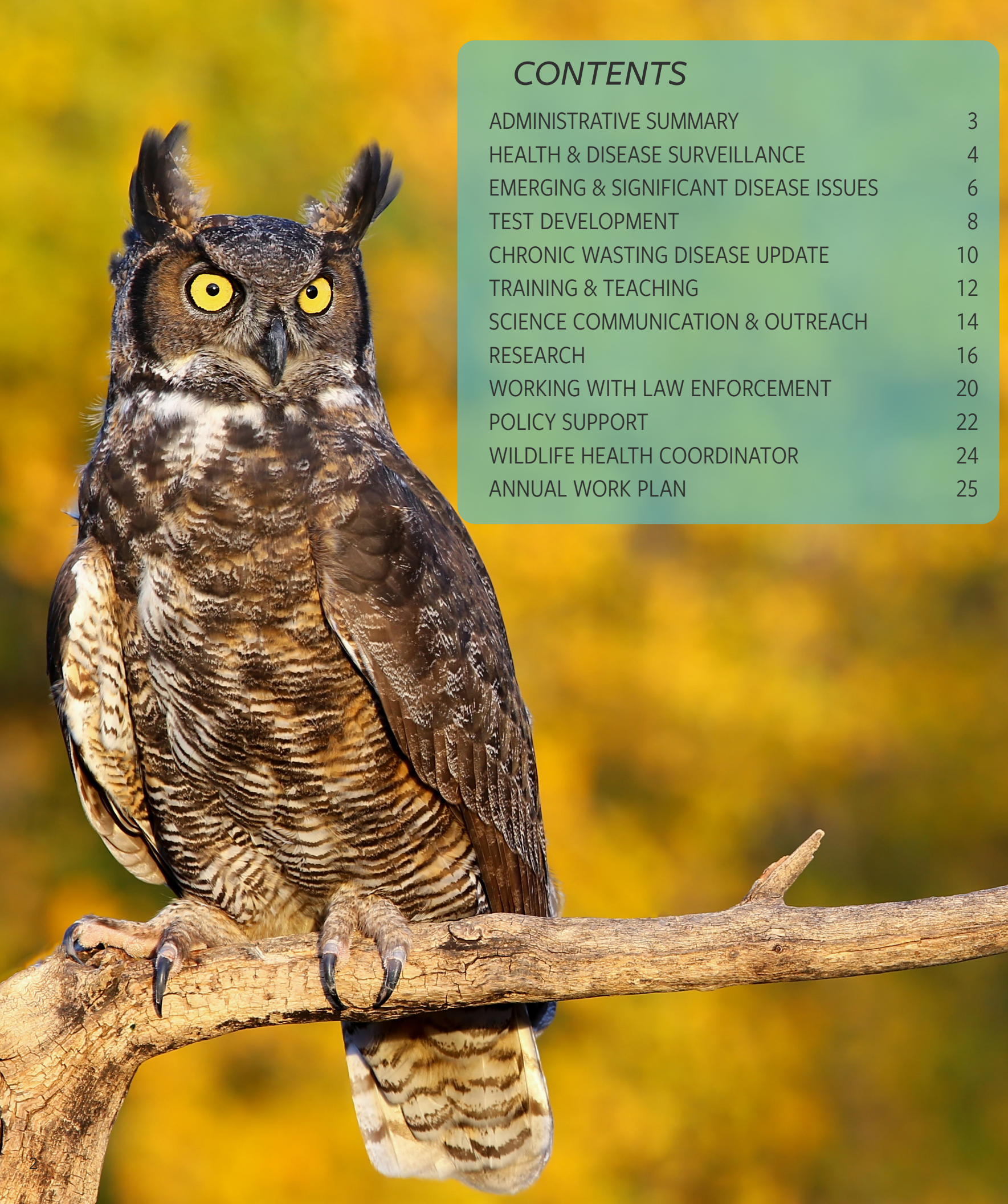


New York State Wildlife Health Program

Annual Report 2023-2024

Promoting the
health and long-term
sustainability of
wildlife populations
by advancing
scientific tools and
sharing knowledge to
protect and improve
the health of native
wildlife populations





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ADMINISTRATIVE SUMMARY

The New York State Wildlife Health Program (WHP) is a partnership between the New York State Department of Environmental Conservation (DEC) and Cornell University’s College of Veterinary Medicine Wildlife Health Lab (CWHL) that works to safeguard the long-term health and sustainability of wildlife in New York. Initiated in 2011, the program is responsible for monitoring wildlife disease and toxin impacts on species statewide, staff training and support, policy guidance, and research.

While this year marked a return to normalcy for WHP with in-person meetings and prepandemic activities, we also had some personnel changes. Dr. Elizabeth Bunting, one of the founding members of WHP, departed. Her special interests fueled areas of student education, herpetofauna health, and wildlife rehabilitation. Dr. Gavin Hitchener had a change of location, moving back to Ithaca, and will continue to serve as a wildlife pathologist for the program at the Animal Health Diagnostic Center. The Duck Lab on Long Island will be used by Dr. Hitchener in a part-time capacity, but most specimens will be shipped to the Wildlife Health Unit. New DEC technician Colby Plant is learning quickly on the job at WHU. Dr. Melanie Kunkel, Northeast Fish and Wildlife Health Coordinator, was hired by the Wildlife Management Institute and is based out of the CWHL to leverage infrastructure and resources available in New York.

There was no shortage of wildlife disease issues to keep the WHP busy. Beginning in 2022, the re-emergence of highly pathogenic avian influenza (HPAI) has inflicted mortality in birds and mammals across the state. Although no mortalities from epizootic hemorrhagic disease were reported this year, we found additional evidence of exposure in hunter-harvested deer, along with detection of bluetongue virus in both wild deer and domestic species. Chronic wasting disease is a looming threat as now 34 states have found the disease. New York stands alone as the only state to have eliminated CWD in the wild. We also leveraged CWD samples for SARS-CoV-2 testing and have not seen sustained viral transmission in deer populations.

Communication gains importance each year. To coordinate across states, DEC organized a CWD communication symposium at the Northeast Association of Fish and Wildlife Agencies. This effort was picked up by the National Deer Association and Midwest Fish and Wildlife Agencies. We continue online messaging with our popular fact sheets, social media, and other partnerships to understand best options to distribute positive conservation health messages.

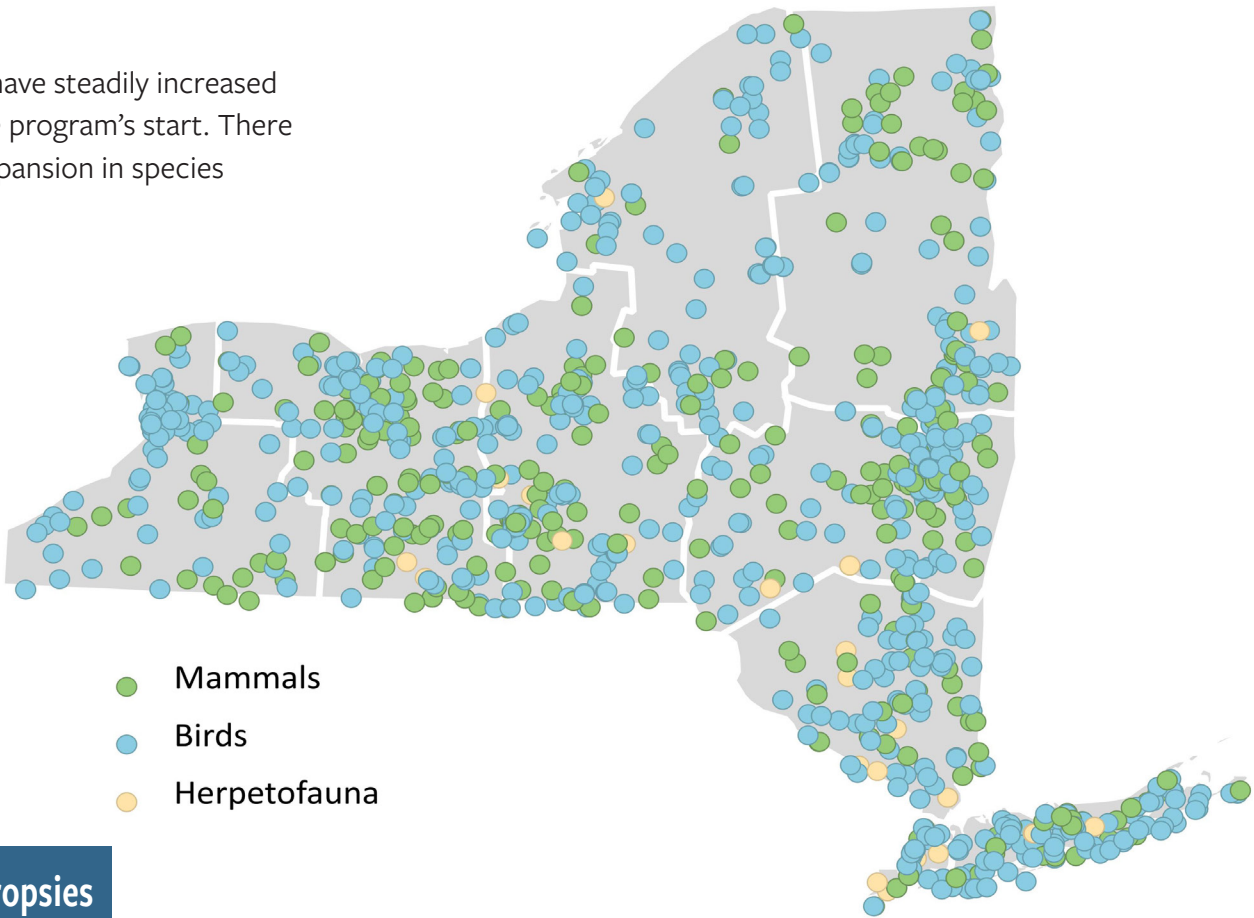
To improve WHP disease surveillance, we launched the wildlife rehabber database in partnership with DEC Special Licenses Unit. We also are building a new laboratory information management system for the WHP, based on the technological structure of the CWD Data Warehouse, which NY has piloted. Currently, there is a push for a national wildlife disease database to integrate across jurisdictions with better coordination and cooperation. We are hopeful the lessons learned in the WHP will guide this development.

As always, we appreciate the support of DEC Bureau of Wildlife to administer the program and our close collaborations with One Health partners across New York and other states. This report covers WHP activities for DEC fiscal year 2023-2024. Case submissions are summarized for the calendar year, Jan. 1-Dec. 31, 2023.

HEALTH & DISEASE SURVEILLANCE

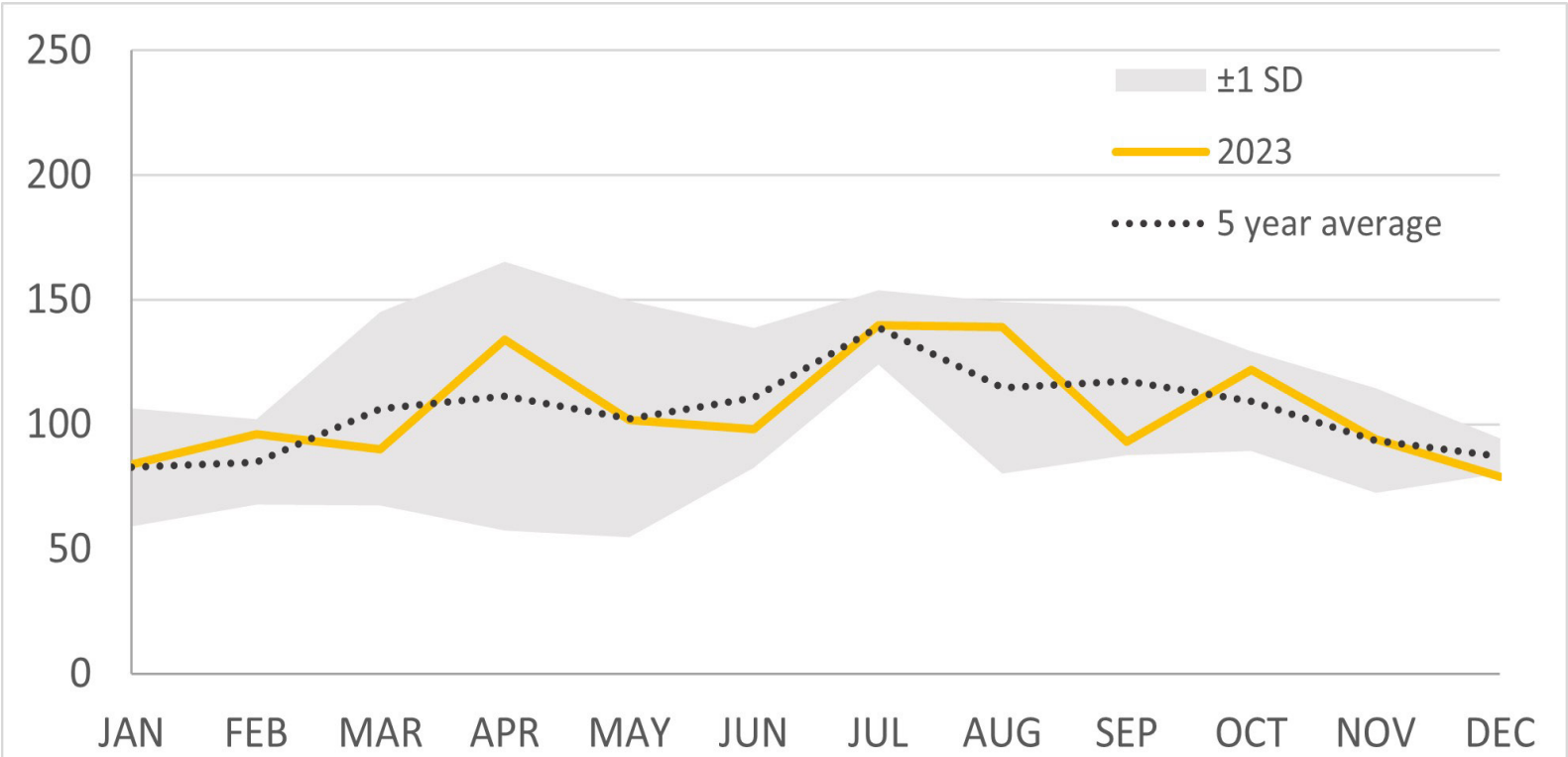
CASE SUBMISSIONS BY REGION

Case submissions have steadily increased each year since the program's start. There is also a notable expansion in species diversity in cases.

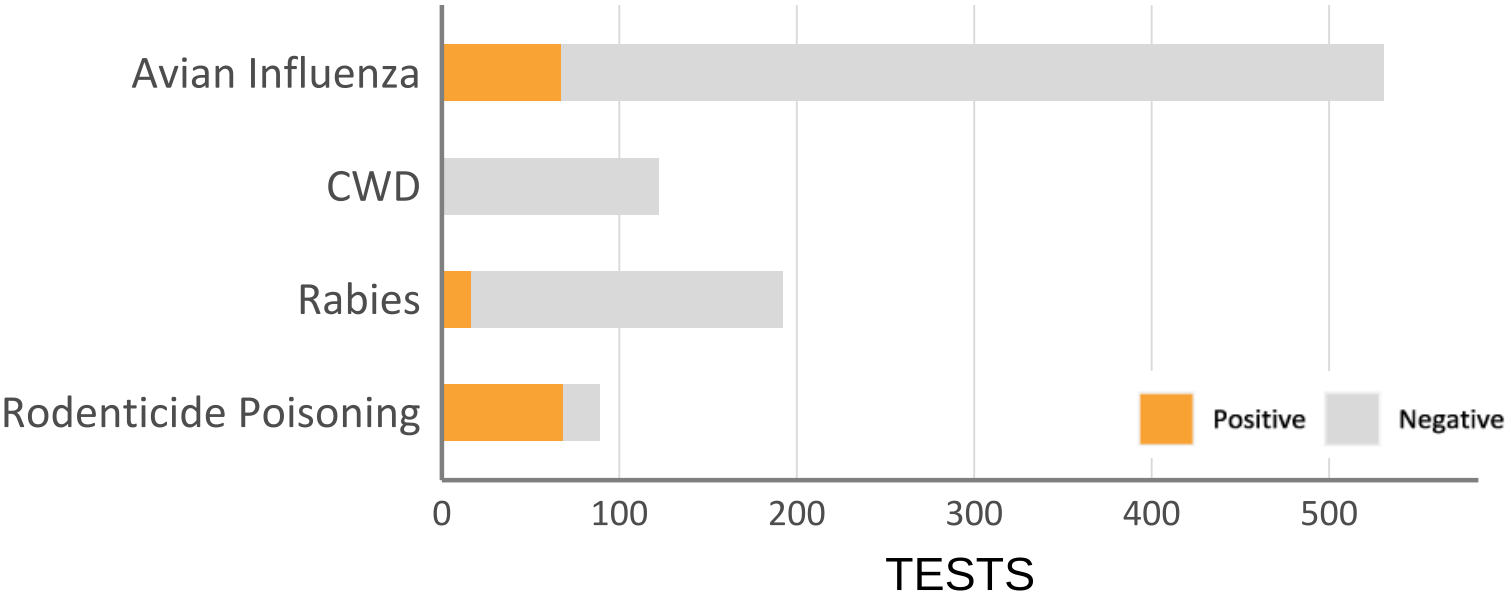


1257 necropsies performed

MONTHLY CASELOAD



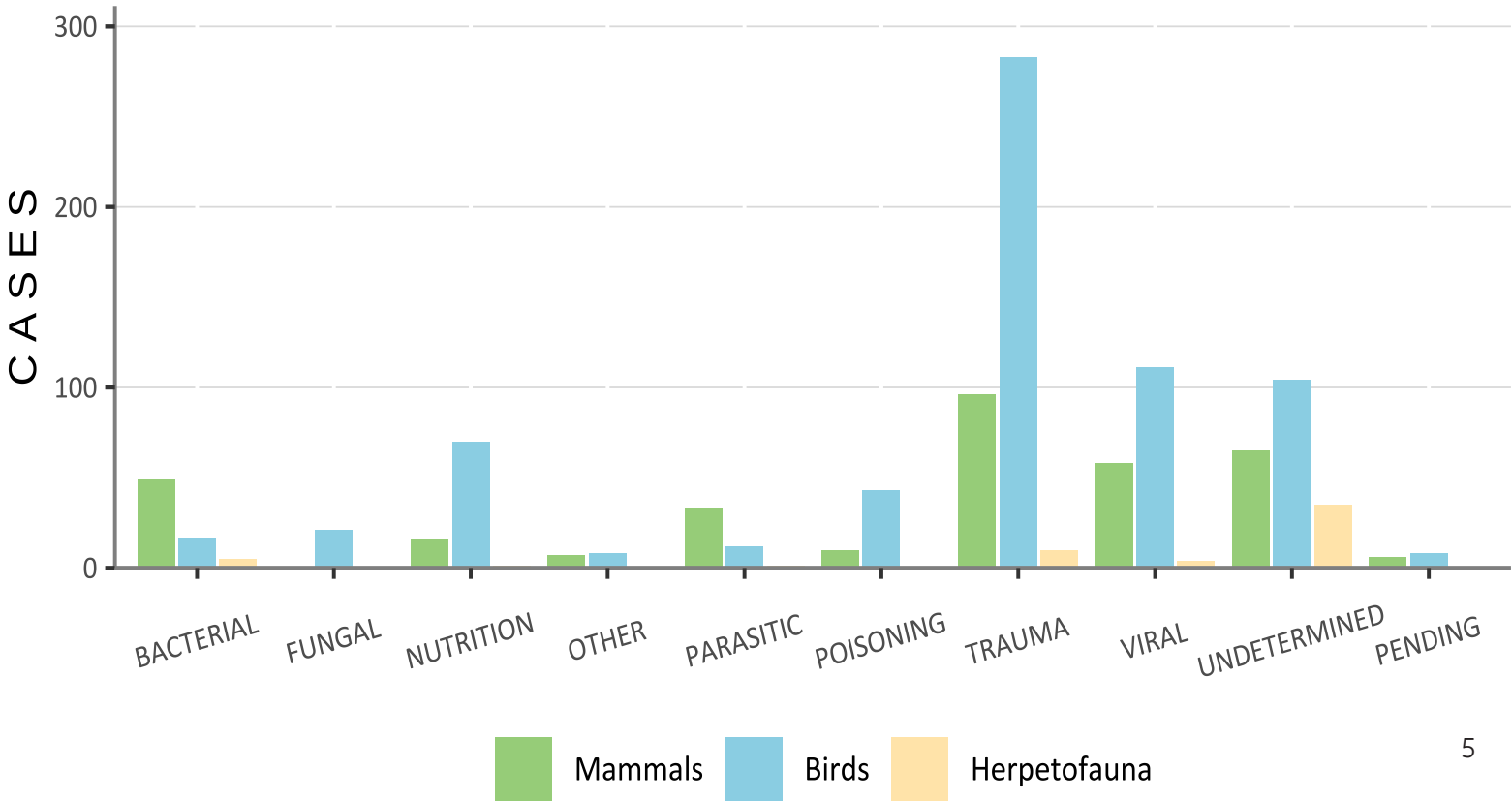
TARGETED DISEASE SURVEILLANCE



1271 animals examined
37 forensic examinations

792 birds **71** species
416 mammals **28** species
58 herpetofauna **20** species

DIAGNOSED CAUSE OF DEATH



EMERGING & SIGNIFICANT DISEASE ISSUES

HPAI

Highly pathogenic avian influenza (HPAI) virus H5N1 clade 2.3.4.4.b continues to circulate in wildlife throughout NY, and the WHP is monitoring cases closely. During this reporting period, 681 avian influenza PCR tests were completed. The virus was detected in 86 avian cases; bald eagles were the most commonly affected species, followed by Canada geese and American crows. While influenza viruses are known to affect mammals, this is the most diverse outbreak of HPAI in mammals ever recorded. During the reporting period, HPAI was detected in 13 mammal cases in red fox, Virginia opossum, bobcat, and raccoon. In partnership with the NYS Dept. of Health, HPAI virus was also detected in a fisher. We update our public and internal agency dashboards, including maps and data, to provide the most up-to-date information about the spread of the virus.

SARS CoV-2

The spillover of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from humans to white-tailed deer (WTD) and its ability to transmit from deer-to-deer raised concerns about the role of WTD in the epidemiology and ecology of the virus. We evaluated 8,083 retropharyngeal lymph node samples collected from free-ranging hunter-harvested WTD from 2020-2023. SARS-CoV-2 RNA was detected in 17 samples (0.6%) from the 2020-21 hunting season and in 583 samples (21.1%) from the 2021-22 season, but only 5 samples (0.002%) from the 2022-23 season. Hotspots of infection were identified in multiple geographic areas of NY in the 2021-22 season. Sequence analysis of SARS-CoV-2 genomes demonstrated cocirculation of three variants of concern: Alpha, Gamma, and Delta. Multiple spillover events (human-to-deer) occurred with Alpha and Delta variants followed by limited

deer-to-deer transmission and adaptation of the viruses. Thankfully, our third season of testing demonstrated minimal incidence of the virus within free-ranging deer. We will conduct a fourth season of testing to evaluate ongoing spillover events, but a transmission mechanism may not be elucidated due to delayed environmental sampling in 2021-22.

LANDSCAPE DRIVERS OF RODENTICIDE EXPOSURE IN NORTHEAST FISHERS

Anticoagulant rodenticides (AR), one of the most common forms of lethal rodent control, have been detected in a wide variety of predator and scavenger species throughout the world, leading to concern about the sources of exposure and whether it leads to negative effects on population persistence. These two questions are especially pressing in the Northeast U.S. where three states are currently considering more restrictive regulations on AR purchase and use. Dr. Jacqueline Frair, Master’s student Georgianna Silveira (both at SUNY-ESF), and the WHP used fishers (*Pekania pennanti*) as a model species to investigate AR exposure and population impact.

We tested fisher livers (n=597) collected through legal harvest from Pennsylvania, New York, Vermont, New Hampshire, and Maine for 11 AR. We compared test results to landscape features, such as urban and agricultural areas, and to region-wide fisher population trends. Fishers were highly exposed to anticoagulants, with ≥ 1 compound detected in 78.6% (n=469 tests) and >1 detected in the majority (55.2%, n=325). Wildland-

urban interface, or buildings interspersed with vegetated wildland, was the most significant predictor of fisher AR exposure, pointing to low-density, residential anticoagulant use as the main driver of fisher exposure, as opposed to use on farms or in densely urban areas. We also found that as AR exposure increased, the probability of trapping success decreased, given harvest records provided by New York, Vermont, and New Hampshire. Our results provide some of the first evidence of the negative association between population trends and chronic, high levels of AR exposure in wildlife.

SAMPLE SIZE EVALUATION

The WHP teamed up with Cornell statistics professors to derive a new sample size equation for contagious diseases in free-ranging wildlife. Selecting samples from wildlife groups with correlated disease statuses can in some cases reduce the number of samples needed to declare the population disease-free.



TEST DEVELOPMENT

LIVER FLUKE eDNA

We previously developed a genetic assay to detect giant liver fluke eDNA in water bodies in the northern Adirondack Park. All extraction and PCR analyses have been completed, and the methods proved successful in identifying the parasite in water samples. The prevalence of giant liver fluke eDNA in samples was extremely low at approximately 1-2%. Such low levels prevented the analysis of environmental factors important for liver fluke occupancy using multi-scale occupancy analysis. However, undergraduate Carol Newman-Rivera will analyze what environmental associations can be gleaned from the sampling data using alternative methods for her senior thesis work.

eDNA - TIGER SALAMANDER

We collaborated with DEC Region 1 on a study to identify the most effective sample collection methods for environmental DNA (eDNA) detection of tiger salamanders (*Ambystoma tigrinum*). We found that collecting triplicate water samples per target pond and filtering them through either a 0.2 µM (250 mL) or 0.7 µM (1L) pore size filter provided the greatest probability of correctly identifying the presence of tiger salamanders within the sampled pond. We shared results with the Eastern Tiger Salamander Working Group (ETSWG) and are developing plans for a collaborative project with ETSWG members to

expand these methods across the range of the species. **This work was funded by the DEC Return A Gift To Wildlife.*

RT-QuIC - MULTI-LAB VALIDATION STUDY UPDATE

Alyssa Kaganer collaborated on a multi-laboratory comparison of Real-Time Quaking Induced Conversion (RT-QuIC) methods for CWD surveillance. With researchers from Michigan, Minnesota, Missouri, Pennsylvania, and Wisconsin, we compared the diagnostic sensitivity and specificity of RT-QuIC on a shared set of retropharyngeal lymph nodes and rectal-associated lymphoid tissue (RAMALT) from deer of known CWD status. The results of this work are under consideration for publication in the *Journal of Veterinary Diagnostic Investigation*.



MARINE MAMMAL - BRUCELLA

Jenny Bloodgood and the AHDC Molecular Lab are developing a molecular test to detect *Brucella* species (pan-*Brucella* PCR). The PCR will detect not only terrestrial species of the *Brucella* bacteria but marine species as well, including *Brucella ceti*, a significant pathogen of dolphins and whales.

**This initial test development is being funded by the AHDC Molecular Lab.*

WNV/EEE MULTIPLEX

Starting in January 2022, all wildlife samples submitted for West Nile virus (WNV) PCR testing were also subjected to Eastern Equine Encephalitis (EEE) PCR as the AHDC Virology Laboratory developed a new multiplex test for the two diseases. From the time testing began to official implementation, EEE was detected in one red-tailed hawk and two ruffed grouse samples. Testing for both diseases will be simultaneous moving forward and may uncover additional cases. We also supported testing for WNV/EEE for research on ruffed grouse being led by SUNY-ESF researcher, Dr. Cynthia Downs.



RODENTICIDE BIOMARKER

In collaboration with the AHDC Coagulation Lab, we are working to validate a biomarker for anticoagulant rodenticide (AR) poisoning in wildlife. Historic AR testing methods demonstrate exposure, but do not indicate the physiologic impact. By finding and validating a biomarker, we hope to have a live animal test and understand what levels of AR exposure may lead to negative effects, such as the inability for blood to clot.



NEW YORK STATE CWD ACTIONS

In 2023, DEC implemented digital data collection for deer check and CWD sampling. Prior to the hunting season, WHP and Central Office staff worked on the process for data collection using Survey 123. Biologists and staff used tablets in the field to record data, which was paired with the CWD Data Warehouse to record progress toward county quotas. This improved data pipeline allowed real-time tracking to improve efficiency. Sample results were paired with deer data in the Warehouse and weekly updates were provided by Landon Miller to regional offices. The CWD Data Warehouse can be accessed by DEC Big Game biologists to update records on taxidermists, meat processors, and captive cervid facilities. Brendan Quirion spearheaded an effort to ensure that all business information was updated on the DEC public website.

In preparation for an update to the New York State Interagency CWD Response Plan in 2025,

WHP hosted an in-person CWD scenario exercise in Syracuse, September 2023. Representatives from DEC Bureau of Wildlife and Division of Law Enforcement, Dept. of Agriculture and Markets, USDA – Wildlife Services, and Cornell Wildlife Health Lab participated in two mock CWD outbreaks by walking through roles and actions each agency would enact given the circumstances.

SURVEILLANCE OPTIMIZATION PROJECT FOR CHRONIC WASTING DISEASE (SOP4CWD)

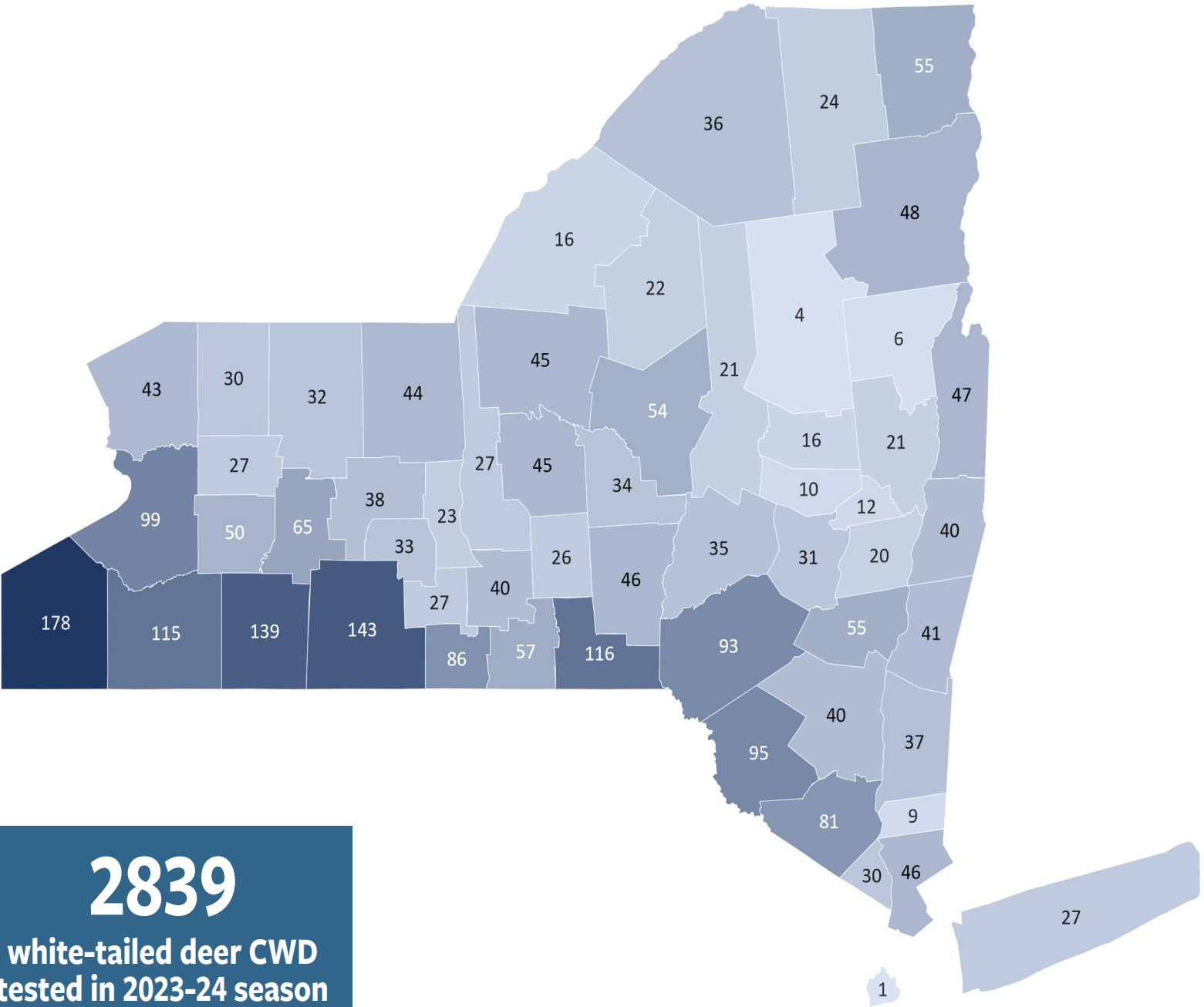
New York continues to be a national leader in tackling CWD challenges. Krysten Schuler had the opportunity to present before the National Academies of Science’s CWD Working Group and the Association of Fish and Wildlife Agencies National Grants Committee on progress of the multistate effort SOP4CWD. Krysten, Nick Hollingshead, and Brenda Hanley gave presentations at the International CWD Symposium, held in Denver, Colorado, on the benefits of joining SOP4CWD. Currently, there are 18 states, 2 provinces, and 1 tribe that are using the CWD Data Warehouse. To recruit western states, Brenda presented SOP4CWD at the annual Western Association for Fish and Wildlife Agencies conference in Santa Fe, New Mexico in July 2023. Since then, several states have expressed interest in joining SOP4CWD, and the WAFWA wildlife health coordinator has become very involved in weekly modeling discussions. We are currently writing grant proposals to expand the CWD Data Warehouse and models to western species and to incorporate additionally complex biology, such as migration and sympatric host species.



CWD SAMPLING

During the 2023-24 hunting season, we opportunistically tested 2,713 hunter-harvested deer for CWD. We also tested 126 CWD-clinical suspect deer and moose during the reporting period. We have successfully engaged taxidermists to expand our surveillance efforts; during the 2023-24 hunting season, 924 of the CWD surveillance samples were collected by trained taxidermists through our Taxidermist Partnership Program.

Over **65,000** wild deer have been tested since 2002 with only two positive cases identified in 2005 and no recurrence of the disease in subsequent years.



2839
white-tailed deer CWD
tested in 2023-24 season

TRAINING & TEACHING

SAFE CAPTURE CHEMICAL IMMOBILIZATION TRAINING

Biologists from across the state attended the Safe Capture chemical immobilization course in Ithaca in March 2024. This course covers wildlife anesthesia which is utilized by DEC for animal capture, translocation, and research. Jenny Bloodgood is working with each region to standardize yearly chemical immobilization refresher courses and to develop a statewide, NY-focused chemical immobilization training.

SUNY COBLESKILL WILDLIFE DAMAGE MANAGEMENT CLASS TRIP

On October 4th and 5th, 2023, the SUNY Cobleskill Wildlife Damage Management class traveled to the DEC Wildlife Health Unit (WHU) to learn about the WHP. This educational experience is given annually in October at the WHU. Kevin Hynes presented a lecture on the activities of the WHP, including examples of damage-related wildlife cases.

Kevin demonstrated necropsy techniques on a bald eagle and explained how a necropsy is



performed and what samples are taken for diagnostic testing to best determine a cause of death.

SUNY-ENVIRONMENTAL SCIENCE AND FORESTRY WET LAB

Dr. Jacqui Frair invited Jenny Bloodgood, Krysten Schuler, and Mark Jackling to present a wildlife health wet lab to her wildlife ecology class. The trio gave brief biographies about their wildlife journeys, including how they became interested in wildlife, their educational pathways, and what their current jobs entail. After a brief necropsy demonstration, students selected specimens, including several species of raptors and passerines. Students performed external and internal exams, identified organs, and collected samples.

FUR SCHOOL

DEC operates Fur Schools each year for new wildlife staff and SUNY-ESF wildlife students. The multi-day course covers all aspects of trapping, including laws, trap sets, species-specific techniques, skinning, fur handling, and sales. Kevin Hynes covers furbearer diseases, how to protect yourself from infection, and a necropsy demonstration.

CWD SYMPOSIUM AT NEAFWA

Jeremy Hurst, Krysten Schuler, and Jeannine Fleegle (PA Game Commission) organized a special symposium at the 2023 Northeast Association of Fish and Wildlife Agencies conference in Hershey, PA on “Communication Confusion: Using human dimensions and creative strategies to provide clarity and consistency to address chronic wasting disease.” Since then, the National Deer Association and the Midwest Fish and Wildlife Health Coordinator, Tricia Fry, have joined forces to carry the communication issues forward and look for opportunities for consistent messaging around CWD.

SPECIALTY TRAINING

CWHL and WHU provided training for DEC personnel. At the CWHL, WHU Research Scientist Therese McNamee learned how samples are received for diagnostic testing and participated in necropsies and pathology rounds. She worked on a great horned owl with infectious stomatitis and a deer with rabies. The CWHL hosted two DEC research technicians for a demonstration of harvesting and processing tissues from waterfowl for contaminant analyses and a lab technician from the AHDC Serology Lab with an interest in wildlife health. The WHP hosted DEC Region 6 technician Bridget McCormick at both facilities to show her WHU/CWHL processes and activities.

ONE HEALTH WET LAB

Alongside Melanie Kunkel and Beth Buckles, research technician David Dayan ran a wet lab for veterinary students titled “Methods of Collecting Wildlife Samples for Contaminant Testing” during the Cornell Veterinary One Health Association Symposium. Using avian specimens, participants were given a hands-on opportunity to learn how to collect tissues for contaminant testing and swabs for highly pathogenic avian influenza.

TUFTS MASTERS OF CONSERVATION MEDICINE EXTERNSHIP

Alexis Sigillo, Masters of Conservation Medicine student through the Department of Infectious Disease and Global Health at Tufts University Cummings School of Veterinary Medicine, interned at both CWHL (3 weeks) and WHU (1 week) in January 2024. She assisted with necropsies, attended pathology rounds, and learned about histology. Additionally, Alexis worked with Alyssa Kaganer on Rhanavirus eRNA, isolating and amplifying the eRNA from samples taken in NYS. She is working on a case study of neoplasia (cancer) in NY wildlife from 2011-2023.



JANET L. SWANSON WILDLIFE HOSPITAL INTERNSHIP PROGRAM

Summer 2023 was the first year of the new Wildlife Health Veterinary Internship at Cornell. Aubrey Alonzo and Kristen Tobin were selected for this one-year opportunity to hone their wildlife veterinary skills. The interns worked with Jenny Bloodgood on free-ranging wildlife health projects with the WHP, Beth Buckles and Gavin Hitchener on wildlife pathology, faculty at the Janet L. Swanson Wildlife Hospital on wildlife medicine, and a faculty member who specializes in fish. During their rotations with the WHP, they participated in activities including bobcat health surveillance, avian influenza surveillance in waterfowl (above), and a whale necropsy.

SOCIAL MEDIA AND WILDLIFE DISEASE FACT SHEETS

From 2023-24, the WHP has added 8 new [disease fact sheets](#) to the resource library on the website: [Sarcocystosis](#), [Brucellosis](#), [Neonicotinoid Toxicosis](#), [Dioxin & PCB Toxicosis](#), [Perkinsea Infection](#), [Mercury Toxicosis](#), [Columbid Herpesvirus](#), and [Duck Viral Enteritis](#).

With 55 available sheets, over 12,000 views per month on different fact sheets, and nearly 150,000 total views during the year, these valuable tools continue to educate and inform the public, DEC biologists, technicians and wildlife professionals across New York State.

Website visits averaged 300-500 daily with over 220,000 page views and engagement event rates of over 675,000 for the year. The website continues to be a valuable resource for wildlife health.

Our social media platforms have grown in followers; a 38% increase on Twitter and 32% on Instagram.

The Hemorrhagic Disease of Deer Fact Sheet (right) had nearly 24,000 views last year.

RADIO AND PODCASTS

CVM podcast

[The Weird and Wonderful World of Wildlife Health](#) with Krysten Schuler discussed efforts to conserve free-ranging species for current and future generations to experience, engaging a multi-disciplinary system of risk analysis, fieldwork, human aspects, and laboratory experiments.

WAMC Radio interview: Outdoors with Jeremy Hurst and Kevin Hynes

Kevin Hynes appeared as a guest with DEC Game Section Biologist Jeremy Hurst on Vox Pop, a live call-in WAMC radio show hosted by Ray Graf, in the episode [“Outdoors with Jeremy Hurst and Kevin Hynes”](#). Topics included CWD, abnormal antler growth, HPAI, coyotes, bobcats, and trail cameras.

Hemorrhagic Disease of Deer

BASICS

Hemorrhagic disease (HD) is a general term for illness caused by **TWO RELATED VIRUSES**: Epizootic Hemorrhagic Disease virus (EHD) and bluetongue virus (BT).

HD primarily affects **WHITE-TAILED DEER** and can cause significant mortality events, particularly in the northern United States. Mule deer and pronghorn antelope are also affected. **DOMESTIC RUMINANTS** (sheep, cows, goats) are also susceptible to HD. Cows typically do not show clinical signs, but sheep can suffer severe disease and death from BT infection. Neither EHD or BT are a disease of humans.

CLINICAL SIGNS of HD in white-tailed deer usually begin approximately 7 days after infection. Fever and edema are common, and deer often have a swollen head, neck, tongue, or eyelids. Animals may have reduced appetite, weakness, and loss of fear of humans. Deer **DIE QUICKLY** within 8 to 36 hours.

HD is **TRANSMITTED** to an animal host by *Culicoides* midges, tiny biting flies commonly known as “no-see-ums” or gnats that are smaller than mosquitoes and other flies.

DIAGNOSIS is based on the combination of clinical signs and virus testing on tissue and blood. Virus identification is **ESSENTIAL** to distinguish EHD and BT from other diseases of agricultural concern, such as Foot and Mouth Disease.

There is **NO TREATMENT** for HD in wildlife populations, and no wildlife prevention plan currently exists.

In NY, please submit reports and photos of sick or dead deer suspected of having HD using the [ONLINE EHD REPORTING FORM](#)

The NYS Wildlife Health Program | [cwhl.vet.cornell.edu](#)
A partnership between NYS Dept. of Environmental Conservation and Cornell Wildlife Health Lab

Complex block containing a deer image with text overlays: "SEEN IN LATE SUMMER & EARLY FALL", "BITE OF INFECTED MIDGE", "ALL RUMINANTS", and "ALERT HOW WHO".

MeatEater Podcast

Krysten Schuler discussed wildlife health and disease with The MeatEater’s Steven Rinella in [“Animal Diseases”](#) (Episode 474). With [behind-the-scenes footage](#) from Cornell’s necropsy lab, no wildlife topic was off limits. Stressing the importance of surveillance, One Health, and what it means to be an ecologist, Krysten discussed CWD, liver flukes and brain worm, lead impact on raptors and fishers, Bsal and Bd threats to amphibians, and why it all matters.



TARGETED SCIENCE OUTREACH

WOAH Wildlife Conservation Day

On World Wildlife Day, Krysten Schuler engaged in a panel discussion on “What’s new in wildlife health data management?”, sharing the CWD Data Warehouse with the World Organization for Animal Health (WOAH).

Let’s talk about lead

This collaborative effort to educate and impact the perception and behavior of deer hunters relating to ammunition choice in NY has produced several scientific publications, a feature article in the Cornell Chronicle [To help eagles, NYS deer hunters can choose non-toxic ammo](#), and an educational video that the DEC has integrated into an online hunter education course [“Your choice of ammunition”](#).

Science Speaker Series at The Wild Center

The Wild Center is a popular natural history center in the Adirondack Park in Tupper Lake, NY and hosts a Science Speaker Series each summer. Jen Grauer was invited to present to the public her research on parasitic threats to moose in New York - [Moose Health and Survival in New York](#)

Skype a Scientist

Alyssa Kaganer has continued to participate in classroom outreach with Skype a Scientist. This year she connected with students in Pennsylvania, New Jersey, Tennessee, Idaho, Iowa, and Telangana, India.



eCornell - One Health

In October, Krysten Schuler, and Jenny Bloodgood sat down to discuss “One Health: Understanding Threats to Wildlife and Human Health” for eCornell’s Keynote seminar series (left). They discussed their experiences from the field and the lab to show how wildlife health and human health are intimately connected.

FISHER/BOBCAT LEAD

As recommended by the NYS Lead Ammunition Working Group, we are investigating the occurrence and distribution of lead (Pb) in scavenging mammals. We found over 43% of trapped fisher (n=589) had detectable levels of Pb compared with 15% of bobcats (n=53). With SUNY-ESF, we are assessing how Pb and anticoagulant rodenticides impact female reproductive potential and population health.

LEAD AMMUNITION CAMERA SURVEY

In support of the New York State Lead Ammunition Working Group, Dr. Andreas Eleftheriou completed a project that identified wildlife scavengers of white-tailed deer in New York. The project’s goal was to catalog scavenger species and assess their risk of lead exposure through ammunition fragments in deer remains.



Photo provided by Michael DiBenedetto

From community members, we received 160 images from 35 game cameras in mid-NY and documented 17 bird and 14 mammal scavenger species. These results demonstrate multiple species at risk, with bald eagles and crows representing the best species to function as bioindicators.

WATERFOWL CONTAMINANTS

To evaluate historic and current chemical contaminants in waterfowl from the Northeast, we were awarded a Multistate Conservation Need grant. CWHL and DEC partnered with the Pennsylvania Game Commission, New Jersey



Division of Fish and Wildlife, and Connecticut Department of Energy and Environmental Protection to collect mallard, black duck, green-wing teal, wood duck, and Canada geese tissues. We detected PFAS, organochlorine pesticides, and PCBs in all waterfowl samples, although concentrations were highly variable. Contaminant levels were lower in Canada geese and wood ducks compared to the other species. Our data was shared with public health agencies to assess waterfowl consumption advisories for hunters and their families.

eRNA

CWHL experimented with pathogen environmental RNA detection to identify active infections. Ranaviruses are DNA viruses that only replicate using host cell machinery, so viral RNA is only produced by an infected host. We experimentally infected wood frog tadpoles with Ranavirus and

collected water samples from their tanks to look for Ranavirus eDNA and eRNA. We found both Ranavirus eDNA and eRNA increased over time following infection, while controls remained negative. This pilot work suggests that eRNA detection methods can be used to track pathogens of free-ranging wildlife with more precision than eDNA methods.

MOOSE HEALTH

In January 2023, researchers and DEC conducted a second year of capture to collar and sample moose calves for the on-going juvenile survival study. We successfully collared 19 moose calves, bringing the total number of collared animals to 30. Animals will be monitored for the next two and a half years or until the moose dies or the collar falls off. We investigated eight collared moose mortalities and found all to be heavily infected with giant liver flukes. PhD candidate, Jen Grauer, will complete a cause-specific survival analysis in the summer 2024.

Fieldwork was completed in the fall 2023. We collected and analyzed two years of trail camera data and found 4,300 photos of moose and 87,000 photos of white-tailed deer. Moose occupied 20%



of the sites while deer were found in every location. Parasite analysis of white-tailed deer pellets found meningeal worm larvae in 32% (81% of sites) and giant liver fluke eggs in 39% (86% of sites). Although models revealed no direct competitive interactions between moose and deer, there is strong indirect competitive pressure on moose from deer via parasites.

HEMORRHAGIC DISEASE & MIDGE TESTING

As part of our investigation of hemorrhagic disease in New York, we are conducting a two-year surveillance effort for *Culicoides* biting midges. Our focus is identifying local species that warrant attention as potential vectors of epizootic hemorrhagic disease virus and bluetongue virus. In the summer and fall of 2023, we deployed CDC-miniature blacklight traps biweekly in natural and agricultural areas in Dutchess, Westchester, and Bronx Counties. Through a collaborative partnership with the USDA Arthropod-Borne Animal Diseases Research Unit, we will determine local *Culicoides* species diversity and abundance, perform blood meal analysis to determine host preference, and investigate whether we can detect EHDV or BTV from pooled samples using PCR and viral isolation. We will analyze our findings to identify environmental and climatic drivers of midge abundance, diversity and infection status.

WHITE-TAILED DEER LANDSCAPE GENETICS

In partnership with the U.S. Geological Survey’s Pennsylvania Cooperative Fish and Wildlife Research Unit, New York provided samples from white-tailed deer for a regional landscape genetics assessment to identify subpopulations of deer to target for disease interventions. Researchers genotyped 5,701 samples from wild deer in Maryland, New York, Ohio, Pennsylvania, and Virginia from 2014 to 2022. Analysis identified two to nine genetic clusters across this region. Work is ongoing using single nucleotide polymorphisms to refine spatial locations based on genetic profiles.

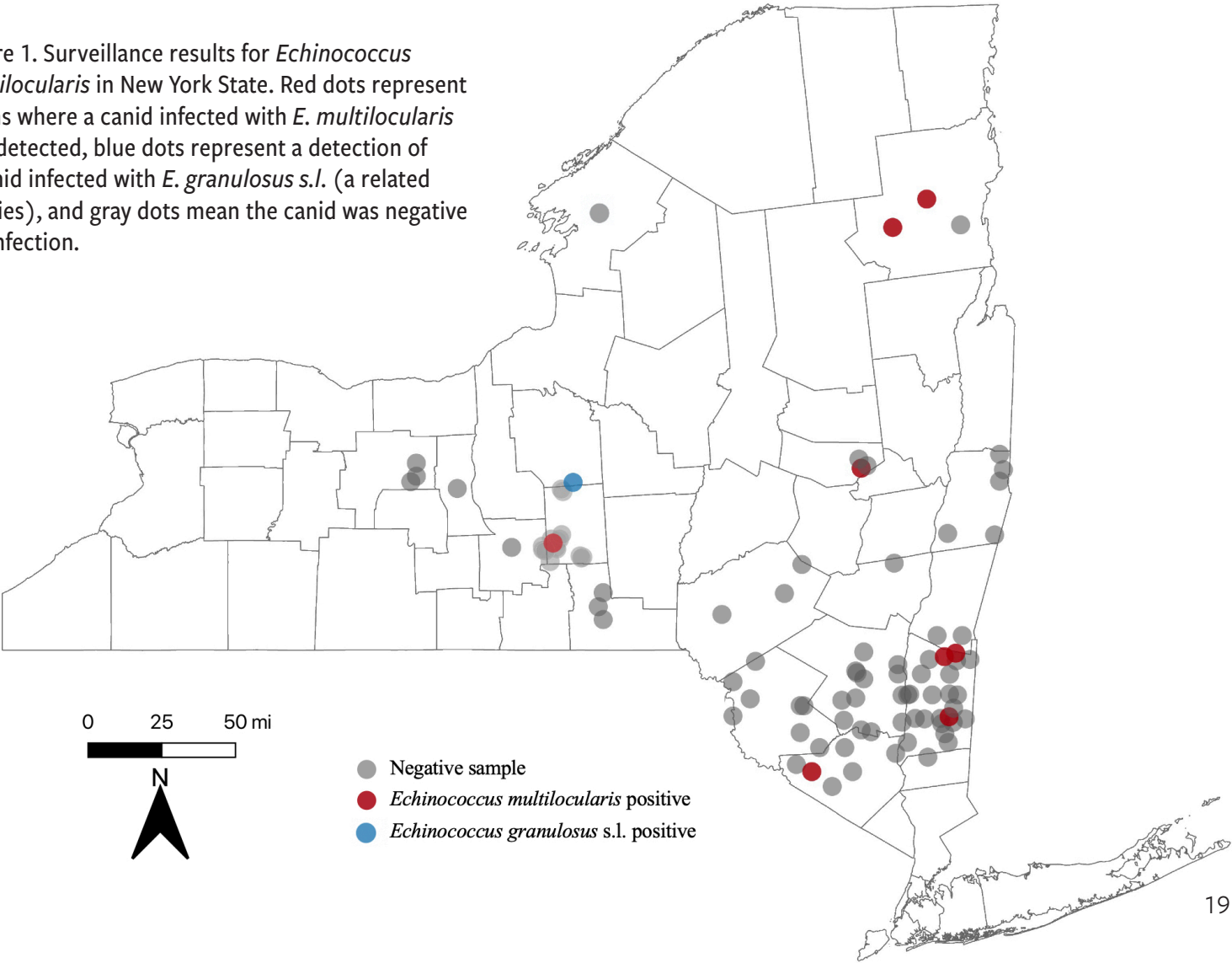
ECHINOCOCCUS IN NEW YORK STATE

Echinococcus multilocularis is a zoonotic tapeworm of wildlife that can be fatal in humans if left untreated. Following the introduction of the European genetic variant of the parasite, rapid expansion of the parasite into the Northeast has resulted in novel detections of spillover to humans, indicating the need for active surveillance to direct public health education and disease control measures.

The WHP, in collaboration with SUNY-ESF, conducted surveillance for *E. multilocularis* in wild canids (the pathogen’s definitive hosts). From 2021-23, we found 7 positive coyotes and 1 positive gray fox out of 96 animals tested (Figure 1). Genetic analysis of the NY parasites revealed them to be more closely related to the European lineage than the North American lineage, suggesting a recent introduction of this parasite into the region.



Figure 1. Surveillance results for *Echinococcus multilocularis* in New York State. Red dots represent towns where a canid infected with *E. multilocularis* was detected, blue dots represent a detection of a canid infected with *E. granulosus* s.l. (a related species), and gray dots mean the canid was negative for infection.



WORKING WITH LAW ENFORCEMENT

WILDLIFE RESPONSE TEAM

DEC’s Division of Law Enforcement (DLE) Wildlife Response Team (WRT) is a special duty team comprised of Environmental Conservation police Officers (ECO’s) throughout the state. All ECO’s have a general knowledge and training of wildlife identification, handling, and how to identify animals in distress. WRT members are trained to a higher-level regarding wildlife ID, disease issues, sampling for both wildlife health monitoring and forensic cases. WRT members attend yearly trainings with Bureau of Wildlife and veterinary staff to maintain up-to-date knowledge and techniques.

DLE works regularly with the WHP. For the last 6 years the DLE has been building relationships with WHP to train and educate WRT members. Currently, the WHP provides the WRT with trainings in chemical immobilization of wildlife, wildlife forensics, wildlife diseases, and safe handling procedures for wildlife sampling, including live animals. All WRT chemical immobilization drugs are licensed and procured through the WHP. Each year, there are developing situations involving wildlife that require a collaborative effort between law enforcement and wildlife health staff.

DLE staff are the public point of contact when dealing with wildlife complaints and have always provided disease monitoring samples from the field to WHP and NYS Health Department. New tools such as snake handling tongs, hooks, and transport containers make these tasks safer and more effective. The relationship between the DLE and the WHP brings the public response to a much greater level of professionalism.

Below: ECO Wamsley and ECO Hameline assist with a bear capture in Region 3.



Above: ECO Wamsley with deer fawns, Region 3.

Forensics

The WHU at Delmar received 15 carcasses or samples for forensic necropsy or analyses last year. Four carcasses were related to illegal gunshots including one that was part of a hunter-related shooting incident. In these cases, we were determining the projectile trajectory in the body (wound ballistics) and recovering projectile or projectile fragments to identify the type of ammunition and caliber if possible. Two of these cases were related to poisoning investigations. The remainder were for DNA analyses to determine individual animal identities (i.e. determine if blood sample from near bait pile on private land matches carcass in possession of suspect) or species identification (sausage).

Training

From BLOC meetings to chemical immobilization training, the WHP and DLE work together to stay at the forefront of safety for staff and the wildlife species they encounter.

Disease surveillance

The CWHL provides diagnostic testing on the DEC submissions that the DLE brings to the Janet L. Swanson Wildlife Hospital, keeping the WRT informed on results that include potential diseases threats to personnel.

Consultations

The WHP provides informed guidance and support on confiscation incidents and surrender of prohibited animals, and offers veterinary assistance and direction to support DLE efforts on sensitive cases.

Right: ECO Paschke monitors a captured seal pulled from Shinnecock Bay before it was returned to the water unharmed.



WRT members with Madeline Wlasniewski Bureau of Wildlife and Roger the rattlesnake. 2023- Joint dangerous reptile training with DEC- BOW, WHP, & DLE.

The WHP provides support on any wildlife health topic, not just limited to disease outbreaks. We routinely review research permit requests, management plans, and project proposals to assist staff in working safely with wildlife and reduce potential health impacts.

REHABBER DATABASE RELEASE

In October 2023, WHP and Special Licenses Unit (SLU) released a new web application for NYS wildlife rehabilitators that allows them to maintain a digital rehabilitation log that aligns with state reporting requirements and agency needs. This new system will improve the quality of the data they collect, streamline licensee reporting requirements, and provide a valuable data resource for wildlife health surveillance.

NYS WILDLIFE REHABILITATION COUNCIL MEETING

WHP staff met with SLU, DEC Bureau of Wildlife management, Cornell’s Janet L. Swanson Wildlife Hospital, and members of the New York State Wildlife Rehabilitation Council to discuss process updates and partnership development. Topics

such as the rabies vector species program, white-tailed deer license conditions, and reporting requirements via electronic log were covered. All parties left with new perspectives and a list of tasks moving forward.

WILDLIFE HEALTH SURVEILLANCE INFORMATION SYSTEM UPDATE

The WHP, in conjunction with a development team, is in the process of creating a new system to replace our current data storage program. In addition to sharing wildlife health cases between WHU and CWHL, the new system will have increased functionalities such as data import from the AHDC laboratory information system, streamlining workflows, and aiding in both data management and analysis. Ultimately, the goal is to have a system that grows alongside the WHP, identifying and filling knowledge gaps to better understand wildlife health issues within NYS. We plan to have a viable product to roll out this fall for testing.

MANGE GUIDANCE DOCUMENTS FOR DEC, REHABBERS, & SLU

Mange continues to be a topic of interest in NYS wildlife, and treatment of free-ranging wildlife is a question often asked by the public. The WHP developed informational documents for the public, licensed rehabbers, and DEC staff regarding mange and best practices for treatment of this disease in wildlife. The public [Mange Response Guidance](#) document is available on the website and licensed rehabber guidance is available from DEC Special Licenses.

LEAD AMMO WORKING GROUP

In December 2020, DEC formed a Lead Ammunition Working Group (LAWG) comprised of DEC wildlife staff (including Kevin Hynes), DEC Legislative Affairs staff, NYS Department of Health staff, Cornell Wildlife Health Lab (Krysten Schuler), NY Audubon, NY Conservation Council, and the NY Venison Donation Coalition. The group met monthly for over a year to take an in-depth look at the potential hazards of lead ammunition use to people and wildlife and what steps NY might take to mitigate them. We solicited information from people and groups nationwide about their experience with legislation banning the use of lead ammunition for hunting, ammunition exchange or rebate programs, performance of lead vs. copper alloy bullets, education programs encouraging voluntary switching to nonlead ammunition, ammunition performance and availability, and ammunition industry perspectives. The LAWG issued a report with recommendations in 2022 titled *Minimizing Risks to Wildlife and People from Lead Hunting Ammunition*. Since that report we have arranged for the North American Non-lead Partnership to conduct a shooting demonstration for DEC staff, sportsmen group leaders, and outdoor writers, updated information in our annual hunting guide, added a non-lead ammunition module to our hunter education course, and produced a video describing hunter education teacher’s personal choices to switch to non-lead ammunition. DEC is exploring ways to implement more of the report recommendations including conducting more shooting demonstrations to sportsmen across the state.

BUREAU OF WILDLIFE HEALTH TEAM MEETINGS

Between 2023-24, representatives of the WHP attended 20 meetings with the Big Game, Herp, Migratory Game Bird, Bird and Mammal Diversity, Upland Gamebird, Land Management and Habitat Conservation, and the Furbearer and Small Game Mammal teams to provide updates on current and emerging wildlife health issues. The Wildlife Health Team held an in-person meeting at DEC Five Rivers Educational Center in February 2024 to go over team priorities and work planning.

The scope of the wildlife health team encompasses all wildlife health related issues involving Bureau of Wildlife programs and responsibilities.

The Wildlife Health Program incorporates the One Health concept, which fosters collaboration among multiple disciplines involving health of humans, domestic animals, and ecosystems. Other specialists from the academic community, Departments of Health and Agriculture & Markets, and federal agencies may participate or provide information as needed.

CURRENT WILDLIFE HEALTH TEAM

DEC Personnel

Region 1	LESLIE LUPO
Region 2	CHRISTINA KNOLL
Region 3	VACANT
Region 4	STACY PREUSSER
Region 5	TIM WATSON
Region 6	CRISTINA MACKLEM
Region 7	ASHLEY MEYERS
Region 8	JESSICA HAGGERTY
Region 9	RYAN ROCKEFELLER

WHP Personnel

WHU	Kevin Hynes (chair)
Cornell	Krysten Schuler/Jenny Bloodgood
BMT Liaison Central Office*	Kevin Hynes
DLE Liaison*	Major Matthew Revenaugh
BMT Liaison (Regional) *	vacant

*DEC Personnel



Dr. Melanie Kunkel was hired in 2023 by the Northeast Association of Fish and Wildlife Agencies (NEAFWA), the U.S. Fish and Wildlife Service (USFWS), and the Wildlife Management Institute (WMI) to be the Northeast Regional Fish and Wildlife Health Coordinator. She is based at the CWHL. During her first year, Melanie has established a regional network of state and federal agency fish and wildlife health practitioners and worked to address wildlife diseases and health issues across the Northeast.

Melanie worked on a variety of fish and wildlife health topics with health specialists and wildlife biologists, including CWD, RHDV-2, mange mites, SARS-CoV-2, HPAI, WNV, furbearer health, great blue heron health, and broadly working in the One Health framework. Activities included drafting talking points on these topics for biologists, writing fact sheets, coordinating meetings to encourage regional approaches to these complicated issues, providing necropsy assistance and educating agency personnel, and aiding in the development of research grants and disease and toxin surveillance, monitoring, and response and management plans.

In collaboration with university and agency health professionals, Melanie coordinated and led a regional wildlife mortality investigation training workshop for biologists and students (right) to increase field staff’s ability to safely and appropriately investigate wildlife mortalities; she also co-organized a fish and wildlife health symposium at the Northeast Fish and Wildlife Conference. Melanie represents Northeast interests and perspectives at the national level by attending national fish and wildlife health meetings and is assisting on several national-level efforts to increase fish and wildlife health capacity.

Melanie currently is working with state and provincial fish and wildlife agencies to develop the Northeast Fish and Wildlife Health Committee and continues to work to improve communications and collaborations among all partners. She is looking forward to what the next year brings.

Left to Right: Therese McNamee, Krysten Schuler, and Melanie Kunkel were instructors at a wildlife mortality investigation workshop at the Northeast Association of Fish and Wildlife Agencies conference in Hyannis, MA.



Program Management

Participate in wildlife health related meetings IRC, CWD, BOW, Wildlife Health and other meetings	Ongoing
Biannual wildlife health program review (Central Office or Cornell)	Complete
Wildlife Resources Center (WRC) infrastructure, equipment management and maintenance	Ongoing
WRC incinerator operation, lab maintenance, facility maintenance and grounds	Ongoing
Administration: budgeting, fiscal, personnel, T&A, LATS, FMIS	Ongoing

Policy Support

Wildlife rehabilitation procedures evaluation	In progress
Providing scientific/medical wildlife health consultation (public, staff, One Health partners, regulatory, research projects, SLU licenses, etc.)	Ongoing
Bog turtle translocation at Bog Brook	Not started

Health and Disease Surveillance

Necropsy evaluation for cause of death (>1200/yr)	Ongoing
Anticoagulant rodenticide evaluation of NY wildlife	In progress
Development of eDNA tools for herp and pathogen detection	Ongoing
Annual CWD surveillance (sample collection, Taxidermy Partnership Program, reporting)	Complete
Case management and reporting	Ongoing
Forensic services for DLE	Ongoing
SOP4CWD westward expansion	In progress
Non-Lead Ammo - test mammalian scavengers (fishers)	Complete
Regional bear mange study	In progress
Regional BAEA HPAI antibody study	In progress
NY wildlife salmonella study	In progress
Mustelid versteria study	In progress
Advancement of RT-QuIC as a diagnostic for CWD in WTD	Complete

Veterinary Support Services

Communicate with veterinarians regarding wildlife health issues	Ongoing
Establish a relationship with Tri-State Bird Rescue for oil spill response	Not started

Preparedness and Response

Collaborate and coordinate with federal agencies on wildlife health issues under the One Health approach	Ongoing
DLE Wildlife Response Team working group	In progress
Develop flow chart for DEC on field investigation and disease response	In progress
Develop Bsal response plan	In progress
Deer field dressing and deboning video for hunters	Complete

Teaching and Training

Chemical immobilization training for DEC staff	In progress
Safe Capture Training	Complete
Annual Furbearer training at NYSDEC Fur School	Complete
Training workshops for DLE staff	Complete
Develop training module for RVS rehabilitators	Complete
Co-mentor 2 Wildlife Health Veterinary Interns	In progress
Regional wildlife health workshops	In progress

Outreach

Provide the public information about wildlife health issues on CWHL website	Ongoing
Annual and Quarterly Wildlife Health program reports	Complete
Wildlife health and wildlife rehabilitators listserv maintenance	Ongoing
Wildlife health presentations for public	Ongoing
Establish relationships with tribal nations	Ongoing
CWD National Communication Strategy	In progress



Research

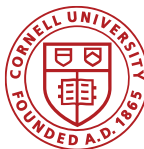
Fisher project - toxin effect on reproduction	In progress
Northeast mesocarnivore assesement	In progress
Tissue archive system - integration with WHIP, organized at WHU and CWHL	In progress
Moose minimum viable number for hunting season	In progress
<i>P.tenuis</i> in white-tailed deer	Drafted
Contaminants in waterfowl (NY/PA/CT/NJ) publication	Complete
<i>Echinococcus</i> in NY coyotes	Complete
Omics study of WTD fecal samples for CWD markers	In draft
eDNA Tiger salamander study	In progress
Interviews of meat processors to understand knowledge of lead issues	In progress
eDNA Queen snake study	In progress
eDNA Hellbender study	In progress
Risk assessment for lead poisoning in scavengers - trail cameras	Complete
Bobcat health study	In progress
eDNA Jefferson x Blue Spotted salamander study	In progress
Ranavirus eRNA study	In progress
Support cricket frog introduction	In progress

Information Management

Provide technical guidance and support related to geospatial data collection, management, and pipelining	Ongoing
Support development of mobile app and web-based field and public data collection	Ongoing
SLU data summary and analysis (captive cervids, taxi/processors, NWCO, Game Birds, Shooting Preserves reports)	Ongoing
Roll out wildlife rehabilitation web-based data management and reporting system to users	Complete
Coordination with NYSDAM and integration into SOP4CWD NY access	In progress
Provide additional mapping capabilities for the public on CWHL website	Ongoing
Plan development of new Laboratory Information Management System	Ongoing
SOP4CWD NAHLN - Data Warehouse integration	In progress
DEC CWD data collection and digitization	Completed



Department of
Environmental
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