New York State Wildlife Health Program Annual Report 2016-2017

Promoting the health and sustainability of wildlife populations through integration of wildlife ecology and veterinary medicine

ADMINISTRATIVE SUMMARY

The New York State Cooperative Wildlife Health Program (WHP) is a partnership between the New York State Department of Environmental Conservation (NYSDEC) and Cornell University's Wildlife Health Lab (CWHL) within the College of Veterinary Medicine's Animal Health Diagnostic Center (AHDC). We work to safeguard the long-term health of New York State's wildlife populations. Our laboratories in Albany and Ithaca conduct surveillance, research, staff training, data analysis, and other activities to support NYSDEC's mission. We maintain strong relationships with partners in human and domestic animal health to address issues common to all under the One Health philosophy.

The WHP concluded five years of formal operation in March 2016. The Cornell contract and supporting Federal Aid in Wildlife Restoration grant were successfully renewed in 2016 after a nearly 2 year process. The contract renewal for April 2016-2021 was initiated in December 2014, and completed and approved on August 8, 2016. A program review and planning session was held in Albany on December 2, 2016, and work planning for the 2017-2018 fiscal year was completed in March 2017.

The new contract supports two additional staff at the CWHL: our geospatial analyst, Nick Hollingshead, and board certified veterinary pathologist, Maria Forzan, who most recently worked for the Canadian Wildlife Health Cooperative at Atlantic Veterinary College. As part of a strategic initiative at the Cornell College of Veterinary Medicine, the CWHL will be designated an independent lab unit and will develop additional specialized wildlife testing.

The Wildlife Health Unit (WHU) staff is located at the Wildlife Resources Center in Delmar. Joe Okoniewski, Biologist 1 and long-time wildlife disease specialist, announced plans for retirement expected in 2017. He performs the majority of the wildlife necropsies at the facility and contributes decades of expertise to the WHP. A position description for a research scientist has been requested to fill this critical role. Kevin Hynes currently serves a dual role as wildlife disease biologist and manager of the Wildlife Resources Center which houses the Wildlife Health Unit Lab. To devote more time to gross necropsy when Joe Okoniewski retires, Kevin will delegate as many routine facility management tasks as possible to a new office assistant. John Shea and Ashley Ableman joined the staff as Fish and Wildlife Technicians, and Ellen O'Malley is recently added administrative support (seasonal Office Assistant). There is still a critical need for a dedicated Wildlife Resources Center building manager.

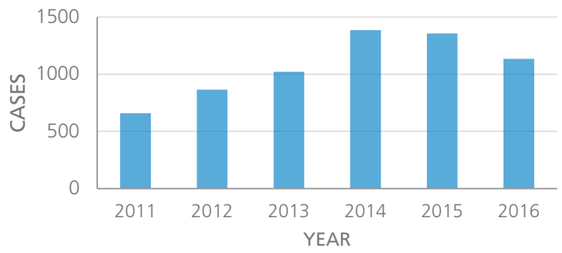
In addition to the contract renewal, major accomplishments include examination of over 1100 cases; development of a website for improved access to case data, training materials and disease information; multiple workshops for staff training; and action on an interagency chronic wasting disease risk minimization plan. This report is a summary of these WHP activities from April 1, 2016 to March 31, 2017, in fulfillment of the contractual agreement between NYSDEC and the AHDC. This report includes a list of current Wildlife Health Team members, the Wildlife Health Program work plan for 2016-17, and proposed plan for 2017-18.

HEALTH AND DISEASE SURVEILLANCE

The WHP conducts continuous opportunistic disease surveillance to establish disease patterns and detect new and emerging threats that can impact wildlife, human, and domestic animal health. In 2011, our first full year of operation, we received 600 cases. In the past two years, the caseload has stabilized at approximately 1200 animals. Our necropsy laboratories handled 1,135 wildlife cases between January and December 2016. Standardized diagnosis coding was completed for all of the cases submitted since 2011, allowing for analysis of nearly 6,000 mortalities by species, geographic area and time of year.

The use of digital tools has improved data collection and communication. Our online case submission system, first implemented in 2015, has streamlined processes and information sharing from field staff. In March 2017, we launched a website for NYSDEC staff to access to real-time case data, disease information, analytics, and mapping tools.

ANNUAL CASELOAD 2011-2016



The WHU has recently purchased a digital x-ray machine to facilitate screening for gunshot and ingested metallic fragments. The equipment was delivered to the Wildlife Resources Center and staff are expected to be trained and operating it by mid-May 2017. The x-ray system is portable so it can be used off-site, but it will mostly be used in the WHU Biosafety Room at the WRC. All specimens suspected of being shot or species potentially ingesting bullet fragments or fishing tackle will be radiographed prior to necropsy.

1135 animals examined

Kevin Hynes continues to offer forensic necropsy services and forensic evidence sample collection training to NYSDEC Environmental Conservation Officers, local US Fish and Wildlife Service (USFWS) Special Agents, and New York City Department of Environmental Protection (NYCDEP) Police. Thirty-eight forensic necropsies were performed in FY 2016-2017 on 14 species.

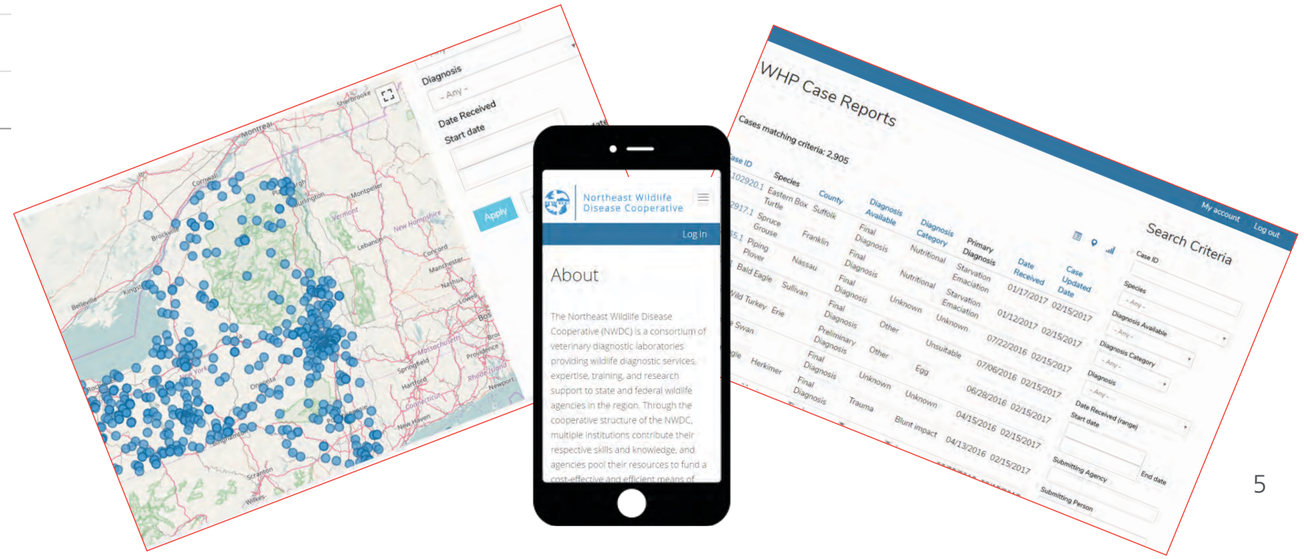
The WHU also designed and assembled 240 Specimen Collection Kits for distribution to Environmental Conservation Officers (ECO) to facilitate dead wildlife collection and submission from this group. ECOs are often the first NYSDEC personnel to respond to calls from the public about sick or injured wildlife, especially outside of normal business hours. This kit contains Personal Protective Equipment (gloves, face shield, boot covers) and various sized specimen bags enabling ECOs to collect specimens as small as salamanders and as large as deer and bear. We have seen an increase in specimens submitted from this group using materials supplied with the kits.

900 necropsies performed

A new, board-certified veterinary pathologist with a special interest in wildlife was formally hired as director of the Cornell Duck Laboratory in Eastport, Long Island, a satellite of the AHDC, in mid-2016. This pathologist, Dr. Gavin Hitchener is assisting with deer necropsies and CWD testing from Region 1. Access to pathology services in this area reduces the time and resources for Region 1 BOW staff to submit cases to the WHP.

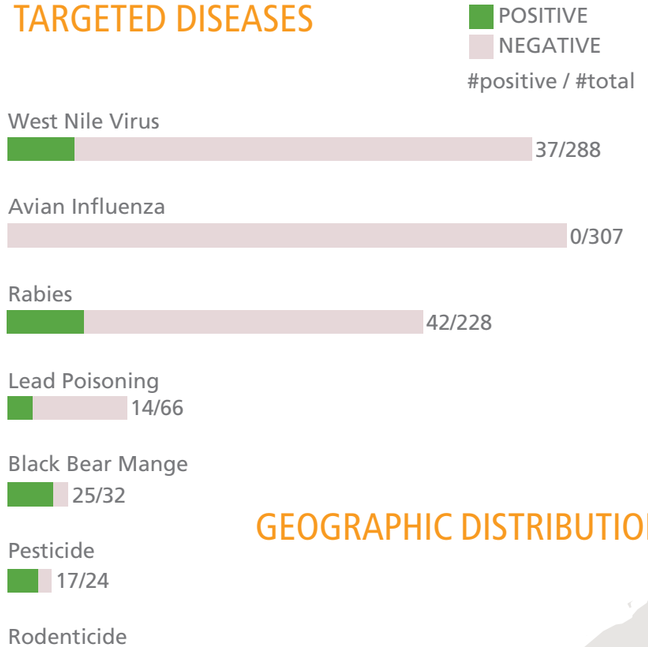
Testing for CWD remains a high-priority for disease surveillance. In 2016-17 sampling year we tested 2,596 hunter-harvested deer. We had 93 meat processors and taxidermists participate in collection of heads and lymph node samples. Since 2002, NYSDEC has tested over 47,000 wild white-tailed deer for CWD, with no additional detections since the single outbreak in Oneida County in 2005.

NEW WILDLIFE HEALTH WEBSITE: MAPPING, REPORTING, AND MOBILE



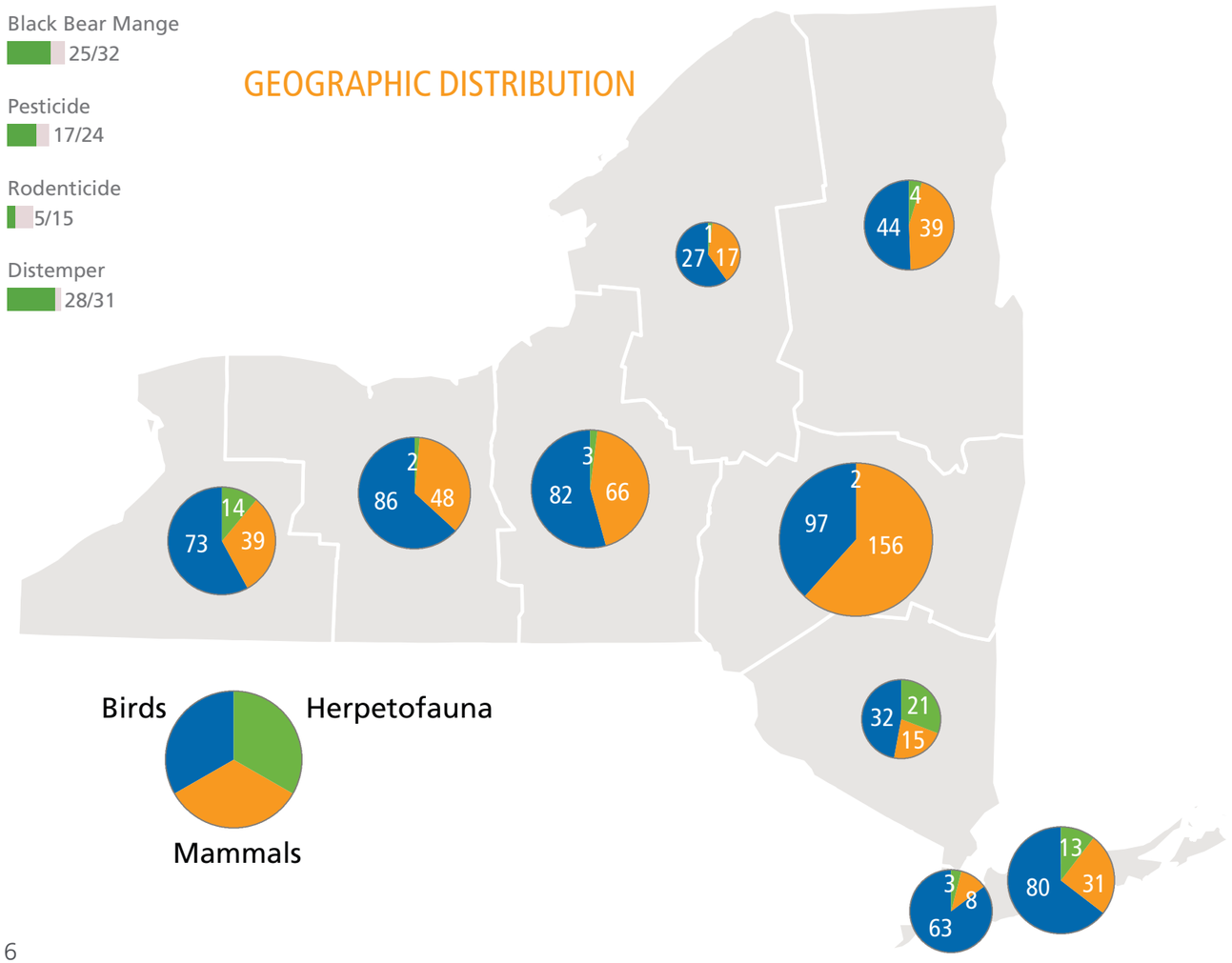
2016 DISEASE SURVEILLANCE DATA

TARGETED DISEASES

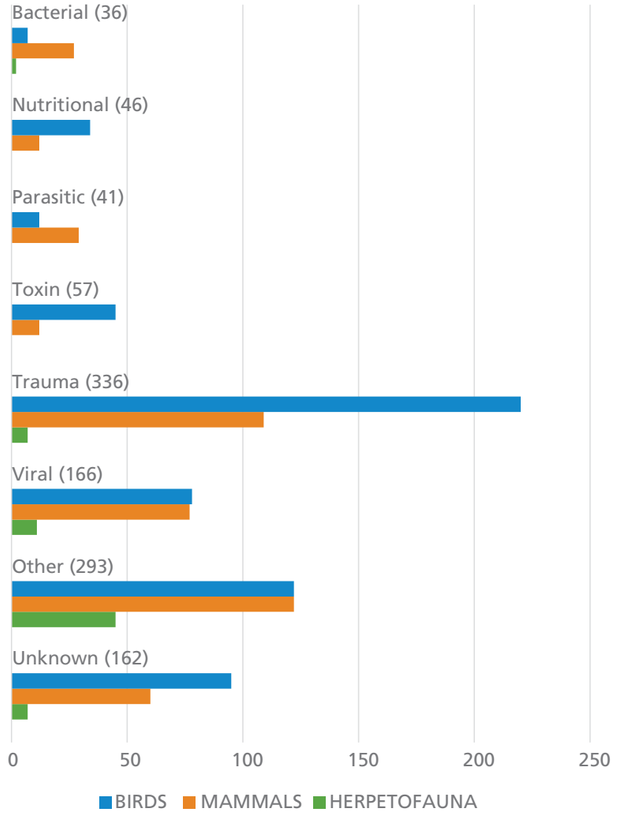


32 black bears examined

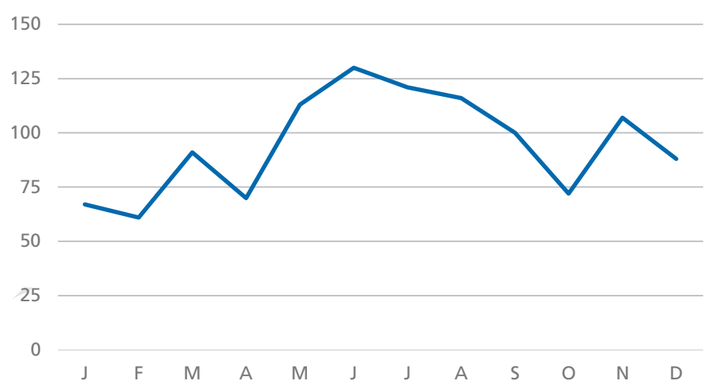
GEOGRAPHIC DISTRIBUTION



DIAGNOSED CAUSE OF DEATH



MONTHLY CASELOAD



MOST COMMON SPECIES EXAMINED

BIRDS	602
Hawks & Eagles	161
Crows & Jays	95
Falcons	66
Pheasants, Grouse, & Allies	39
Owls	37
Gulls, Terns, & Skimmers	30
Ducks, Geese, & Waterfowl	25
Pigeons and Doves	23
Loons	18
Thrushes & Allies	16

MAMMALS	444
White-Tailed Deer	109
Raccoon	54
American Black Bear	32
Striped Skunk	28
Eastern Gray Squirrel	27
Big Brown Bat	25
Red Fox	24
Moose	22
Fisher	21
Porcupine	13

HERPETOFAUNA	70
Northern Map Turtle	12
Spotted Salamander	10
Timber Rattlesnake	9
Eastern Newt	7
Snapping Turtle	5
Eastern Hellbender	5
Terrestrial Garter Snake	3
Red-Eared Slider	3
Milksnake	3
Bog Turtle	3
Eastern Box Turtle	3

Conservation CSI: Researchers solve mystery of mass turtle die-off

Through collaboration with the NYSDEC biologists, Wildlife Rehabilitator Karen Testa and the laboratory of Chris Gobler at SUNY Stonybrook, WHP researchers determined that saxitoxin, a potent neurotoxin from algal blooms, was behind a die-off of over 200 diamondback terrapins from Flanders Bay in 2015. This threatened species has already experienced steep population declines around Long Island, and the unprecedented die-off had potential to impact the survival of the terrapin population in the area.

These findings were recently published in the journal Toxicon, "The role of a PSP-producing Alexandrium bloom in an unprecedented diamondback terrapin (Malaclemys terrapin) mortality event in Flanders Bay, NY, USA." 2017, 129 36-43.

New York State DEC wildlife technician Nick Mancuso collects bodies of dead turtles to send back for necropsies.
Photo credit: Peter Blasl, 2015

EMERGING DISEASE ISSUES

Snake Fungal Disease

Wildlife agencies in the Northeast and Midwest are detecting increasing numbers of snakes with fungal disease (SFD) from *Ophidiomyces ophiodiicola*. Multiple New York species are affected including garter snakes and milk snakes, but the timber rattlesnakes and Eastern Massasauga are of particular concern due to low population numbers. The WHP is working with a multistate effort to map the distribution and impact of the disease. We participated in a two-day SFD workshop at the USFWS National Conservation Training Center, WV, to discuss diagnostics, field investigation, and future steps.

Black Bear Mange

In 2016, 32 black bears were submitted to the WHP. Mange was the second leading cause of death for black bears, behind trauma. Bears with mange also had a higher likelihood of being involved in a nuisance complaint than unaffected bears. Mange cases in black bears have been reported since 1970, but are increasing in frequency in recent years. Clinical signs of mange in black bears are primarily alopecia (hair loss), which can reach 50 to 90% of the body area, and poor body condition. The common maing mite, *Sarcoptes scabiei*, appears to be the primary pathogen in PA and NY bears, but the program is examining the genetics of the mite to determine if there are subspecies that are specific to bears.

Timber rattlesnake anesthetized for biopsy to diagnose snake fungal disease

Avian Influenza

The 2015 outbreak of high pathogenic avian influenza was the largest in the United States, involving over 40 million turkeys in the Midwest. A small number of wildlife cases in raptors and waterfowl were documented in the Mississippi, Central, and Pacific flyways. We subsequently increased surveillance in the spring of 2015 and continue to test all waterfowl and raptors. Of 815 cases screened since 2015, four AI positive birds were detected; none of the cases were highly pathogenic strains of concern. NYSDEC field staff received updated biosafety protocols for field work. Avian influenza has recently been reported in chickens in the southeastern US, so we will continue testing mortality submissions. USDA-Wildlife Services also conducts surveillance of live waterfowl in New York and shares their data with the WHP.

307 birds tested in 2016

Batrochochytrium salamandrivorans

In 2014, Belgium and the Netherlands reported losses of wild salamanders due to the introduction of a new strain of chytrid fungus, *Batrochochytrium salamandrivorans* (Bsal). The fungus has not been detected in the US, but efforts are underway to survey wild populations. The most vulnerable are the plethodont (lungless) salamanders.

Asian salamanders carry the fungus, and these species are commonly imported in to the US for the pet trade. US Fish and Wildlife Service (USFWS) enacted emergency regulations to prohibit import and movement of 200 susceptible salamander species, some of which are native to the United States. Because wildlife agencies have no legal authority over captive animal sales or possession, efforts to contain this pathogen will rely on early detection, biosafety, and public education.

In the last year, the WHP obtained a test permit from USFWS and is working with the molecular lab at the AHDC to bring the Bsal test online.

DISEASE PREVENTION AND RESPONSE

Batrochochytrium salamandrivorans

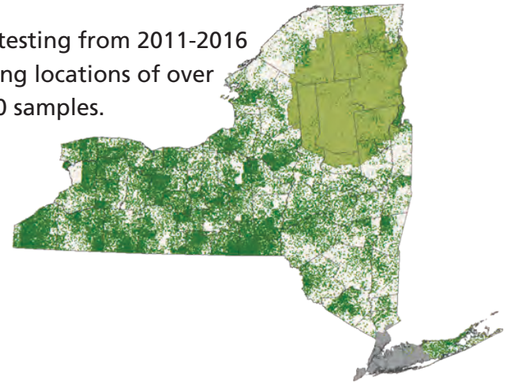
In February of 2016 the WHP accepted a submission of a captive Chinese Newt that died with skin lesions after being purchased from a pet store in Long Island. We were concerned that this animal could be infected with "Bsal," a newly identified fungus that had caused high mortality in wild European salamanders. It would be the first suspect case in New York, and one of the first in the US.

At the time, the USFWS had just instituted emergency restrictions on interstate movements of salamander species, and no laboratories in the US had appropriate permits or testing available to examine the newt. The WHP was able to necropsy the newt and then coordinate with the USGS National Wildlife Health Center and USFWS to fast track permits and testing through USGS. While this case was negative, it was helpful in establishing prevention and response criteria for the disease.

Chronic Wasting Disease

Chronic wasting disease represents a serious threat to New York State's wild white-tailed deer and moose populations and captive cervid industry with potentially devastating economic, ecological, and social repercussions.

CWD testing from 2011-2016 showing locations of over 13,000 samples.



In conjunction with NYSDEC Division of Law Enforcement and NYS Dept. of Agriculture and Markets, the WHP created a prevention plan to minimize the risk of re-entry and spread of CWD in New York State. Actions were considered based on expert CWD risk assessment, scientific evidence, field surveys, participant knowledge specific to New York and a desire to develop a plan that both agencies could endorse and implement. The plan was submitted for management review in 2014, but was delayed for two years by a number of staffing changes. The plan was revised and resubmitted to NYSDEC executive staff for approval in in late 2016.

The WHP provided background research, economic analyses, and support to the NYS Dept. of Agriculture and Markets to support a regulation banning the importation of all captive white-tailed deer in 2013. WHP participated in a NYSDAM public information session in March 2017 to support the renewal of the deer import ban.

2568
White-tailed deer CWD tested in 2016

TRAINING, TEACHING, OUTREACH

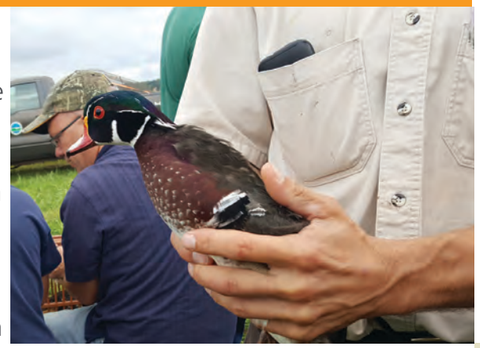
Workshops

The WHP hosted our third round of training workshops at 6 regional offices during the spring and summer of 2016. Over 170 staff from NYSDEC Bureau of Wildlife, Division of Law Enforcement, New York State Parks, Recreation and Historic Preservation and USDA-Wildlife Services attended. The 2016 training included lectures in biosafety, emerging diseases, and field response with a hands-on lab for avian influenza sampling.

170 workshop participants

Safe Capture International Inc. again was invited to provide a two-day training workshop for 27 wildlife staff to review chemical immobilization practices. All staff that complete the program receive a certificate of competency good for three years. Additionally, the WHP provided training in safe handling and zoonotic disease risks at the first Waterfowl Banding and Fur School workshops organized by NYSDEC biologists.

Kevin Hynes gave presentations and led training workshops for DEC law enforcement staff across the state covering the following topics: the use of personal protective equipment (PPE) when handling dead or sick wildlife; common wildlife diseases in NY; forensic DNA sample collection and preservation techniques; techniques to estimate postmortem interval (time since death) in white-tailed deer; and evidence packaging and submittal procedures to ECOs in Regions 5, 8, and 9 and to all new candidates at the ECO Training Academy in Pulaski.



Teaching

The program engaged 14 undergraduate, graduate, and high school students in summer internships, school-year employment, research projects, and independent study courses. Students supported the hosting of the WDA conference, and participated in research including a hellbender field project, deer fawn survival study, and moose health project. Students also gathered information for disease fact sheets and strategic initiatives.

Outreach

The WHP also spoke at the NYS Conservation Council, NYSDEC Fish & Wildlife Management Board, NYS chapter of the Wildlife Society, and NYS Bow hunters. Additionally, WHP staff provided guest lectures to undergraduate and veterinary classes at Cornell, SUNY Cobleskill, College of Saint Rose, and Paul Smith's College. Kevin Hynes served as a panelist for a panel discussion about lead ammunition, impacts on humans and wildlife and non-toxic alternatives.

Kevin Hynes demonstrates appropriate Personal Protective Equipment (PPE) at a training workshop

Wildlife Disease Association Conference

The WHP hosted the international Wildlife Disease Association meeting in from July 19 to August 5, 2016 at Greek Peak Mountain Resort in Cortland, New York. The WDA is an international organization founded in 1951 to focus on the health and diseases of wild animals in relation to their biology, conservation, and interactions with humans and domestic animals.

370 conference attendees

The conference theme was "Sustainable Wildlife: Health Matters!" Kathy Moser, NYSDEC Deputy Commissioner, gave an opening address. There were 370 attendees from 25 countries. Over the course of six days, there were workshops, invited presentation, special topical sessions, and breakout meetings of the American Association of Wildlife Veterinarians and international wildlife health surveillance planning groups.

In addition to the conference organizing, the WHP staff and students gave nine presentations or posters on work completed in NYS and taught workshops on field techniques for wildlife research and disease surveillance, cutting edge tools in biotechnology instrumentation and methods, and geospatial applications in wildlife disease surveillance and outbreak response.

There was considerable time for social interaction among attendees with a welcome reception hosted by the Atkinson Center for a Sustainable Future, a student-mentor bar-be-que, a fundraising auction held at the historic State Theatre in Ithaca, and a concluding banquet on the shore of Hope Lake. The meeting raised $50,000 for the WDA endowment.

The WHP staff are engaged in research projects ranging from the laboratory bench to the field, which resulted in publication of seven scientific papers in the past year.

Improving Eastern Hellbender Survival

After several years of documenting poor survival in captive rear and release hellbenders, NYSDEC biologists teamed with the WHP in the summer of 2014 to systematically monitor a small group of released hellbenders in hacking cages and assess health and survival on a regular basis.

The field trial showed that all the released animals became infected with Batrachochytrium dendrobatidis (Bd) fungus within a few weeks; 19 of 21 died within 6-8 weeks of release. In 2015-16, we then initiated a pilot project with 70 hellbenders in our laboratory to test a killed chytrid vaccine. This project was partially funded by grants from Cornell Vet and the Atkinson Center for a Sustainable Future at Cornell.

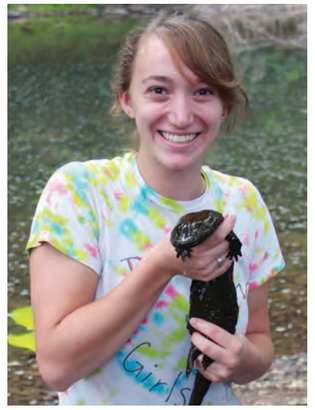
After analyzing over 2,000 samples, we concluded the vaccination did not protect the animals from infection or reduce the Bd loads; however, there were no deaths in the colony during the experiment.

Graduate student, Alyssa Wetterau, is now collaborating with the Smithsonian Institute to understand how the immune system in hellbender skin responded to the infection trial. We are planning a field project for summer 2017 with collaborators from NYSDEC, Buffalo State College, Buffalo Zoo and the Cornell Wildlife Health Clinic to test alternate release strategies with vaccinated and unvaccinated individuals and assess long term survival through radio-tracking.

Dr. Robert Ossiboff, graduate student Alyssa Wetterau, and WHP research program coordinator Niki Dean swab a hellbender to assess the response to chytrid vaccination.

Pathogen and Species Detection by eDNA

Through a grant from NYSDEC, our program partnered with the laboratory of Matt Hare in the Department of Natural Resources at Cornell and Jim Gibbs at the SUNY College of Environmental Science and Forestry to develop eDNA tools for detection of ranavirus as well as a number of amphibian species of concern in New York.



Once these eDNA tools are developed, NYSDEC will be able to submit samples to our laboratory to determine the presence or absence of these species from water samples, improving species distribution information while reducing staff time and effort.

Graduate student, Alyssa Wetterau (shown below), completed the first phase of the eDNA project in March 2017. By analyzing tadpoles and matched water samples from spring to fall in a group of experimental ponds, she documented ranavirus infections in the tadpoles and was able to develop an eDNA assay for the virus in water samples.

Interestingly, ranavirus levels in the water samples persisted long after the infection was gone from the tadpoles and at high levels through the fall. In the next phase of the project, she will work with a citizen science program at Cornell's Aquatic Animal Health Lab to collect water samples around the state that will be tested for eDNA of priority amphibian species.

Anticoagulant rodenticides continue to cause mortality in New York City raptors.

Rodenticide Poisonings

In past decades, NYSDEC's Joe Okoniewski has conducted several surveys for rodenticides in raptors, finding high numbers of birds with these toxins in their liver. These products can cause spontaneous bleeding in exposed animals, but there are no diagnostic tests available for live birds. It is also unclear if chronic low level ingestion of these compounds adversely impacts survival. The WHP received a grant from the Wiederhold Foundation through the Cornell Vet College to examine the effect these sublethal exposures have on blood coagulation in exposed birds. We have so far established two coagulation tests for use in live birds, and have processed samples from 39 wild red tailed hawks, 12 of which had rodenticides in their system.

From these samples, it appears that there may be a tipping point of exposure that causes excessive bleeding in response to injury.

Bald Eagle Mortality

A retrospective analysis was completed looking at the health of bald eagles in NY over the past few decades. Major mortality sources include trauma and lead poisoning. In cooperation with other Northeast states, we are conducting a meta-analysis of lead levels to determine demographic and spatial trends. Preliminary analysis indicates that lead poisoning is seen most often in the winter and spring in adult eagles, and is responsible for the death of 17% of bald eagles submitted to the program.

17% Bald Eagles with lead poisoning

Deer Fawn Survival

The WHP has worked with Dr. Paul Curtis and his graduate student, Martin Feehan, to understand Neospora caninum transmission in deer at Fort Drum Army Base. Neospora can be transmitted from doe to fawn and has the potential to cause abortions. Ft. Drum deer appear to have a higher rate of seroprevelance than has been reported in previously in the scientific literature. Neospora has also been found in NY and ME moose and may be limiting growth in these populations.

Muskrat photo by Scott Smith

Muskrat Pelt Abnormalities

Region 8 Biologist, Scott Smith, asked the WHP for assistance in understanding the cause of a coat abnormality in trapped muskrats referred to as "kidney spot." Affected animals have thin, abnormal fur in circumscribed areas over the back. The abnormality affects the value of the pelts. Biopsy samples from 50 muskrat pelts have been taken to examine the differences in skin pigmentation and hair growth in normal and abnormal animals. Dried pelts are scanned to study pigmentation patterns, and blood and tissue samples await hormone analysis.

Fort Drum Deer Fawn Survival Study

Moose Population Health

The WHP is a partner in a multi-institutional study of moose populations in the Adirondacks. In 2016 we conducted serosurveys on 11 live moose and necropsies of 22 moose to determine causes of mortality. Major threats to the moose population in NY include deer brainworm (*Parelaphostrongylus tenuis*) and giant liver fluke (*Fascioloides magna*). We are in the process of developing testing capability for brainworm in deer fecal samples and gastropods, the intermediate host for P. tenuis. Information gathered will be shared with the NYS Cooperative Fish and Wildlife Research Unit to develop a risk map for moose across northern NY.

POLICY SUPPORT

Our program staff draws on a variety of resources and expertise to provide NYSDEC with the most up-to-date scientific information in wildlife health. We regularly review research permit requests to ensure wildlife will be safely and humanely handled and to reduce the risk of disease transmission. In recent months, we have also given input on community deer management plans, captive breeding and release programs, and nuisance wildlife practices.

During the training workshops, the WHP collected information from staff regarding the supplies, equipment, and facilities they had available for wildlife health-related work at each of the regional offices. All offices are now supplied with disease outbreak kits that contain all the protective equipment and shipping materials needed to handle a wildlife mortality event. Details from the facilities review will be summarized and provided to NYSDEC division management along with best practices recommendations to ensure that staff can function safely and efficiently.

NYSDEC has approved a number of experimental municipal projects designed to reduce urban and suburban deer populations where hunting is restricted. White Buffalo Inc., a private company engaged by the municipalities, has submitted proposals for immobilization and sterilization of both does and bucks in several communities. Dr. Bunting conducted detailed reviews of the proposals and provided recommendations for license conditions to ensure the activity conformed to veterinary medical and welfare standards

Based on input from the NYSDEC, the WHP revised the Wildlife Health Team charge in 2017. The WHP will be working to improve integration of program principles and participation in the management activities of the NYSDEC by attending other specialty team meetings and providing written operational recommendations for common issues, including drug withdrawal times, wildlife translocation, and captive rearing of wildlife for release.

Disease response coolers packed with supplies have been provided to regional offices.

WILDLIFE HEALTH TEAM

The scope of the wildlife health team encompasses all wildlife health related issues involving BOW 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.

Team Meetings

The Wildlife Health Team will meet twice annually, once in person and once via teleconference. Meeting agenda items are formulated prior to the meeting and generally include updates on Wildlife Health Program activities, research projects, and new statewide and/or national wildlife health issues.

The WHP personnel at the 2016 WDA banquet

Team Members

Region 1, Leslie Lupo, Region 2-Sandy Chan, Region 3-Tim Watson, Region 4-Karl Parker, Region 5-Paul Jensen, Region 6-Blanche Town, Region 7-Tom Bell (Co-Chair), Region 8-Jenny landry, Region 9-Ryan Rockefeller, WHU-Kevin Hynes (Chair), AHDC-Krysten Schuler, AHDC-Beth Bunting, BMT Liaison (Central Office)-Patrick Martin, DLE Liaison-Major Matthew Revenaugh, BMT Liaison (Regional)-Michelle Gibbons

Team Charge

- Communicate regularly with the Bureau Management Team (BMT) through the two Management Team members.
- Develop and implement the program as defined in the above scope as directed by the BMT.
- Recommend policy/program/research needs for Wildlife Health Program.
- Use sub-teams to address specific work tasks as appropriate with review by the entire team.
- Develop and maintain effective working relationships with other governmental agencies, nongovernmental organizations, and stakeholders. This can be accomplished in part by incorporating representatives from such entities into team functions when possible.
- Keep appropriate regional and central office personnel fully informed about the work of the team.
- On an annual basis (January through March), develop proposals for the Division's work plan.
- Provide reports on projects under jurisdiction of the team as needed.
- Develop and disseminate technical information for the public and the media (via DEC website, outreach materials, presentations, interviews, etc.) regarding wildlife health incidents and response to Press inquiries.
- Support statewide and regional efforts to support wildlife disease management initiatives as appropriate (e.g., managing white-nose syndrome; rabies)
- Maintain awareness of emerging wildlife disease threats.
- Team Members will act as Wildlife Health liaisons for staff in their respective Region, disseminating disease information, facilitating sample collection and submission, and ordering supplies and PPE for Regional Staff through the WHU.
- Maintain liaison with the Division of Law Enforcement to ensure that wildlife health laws and regulations are effective and enforced.
- Share team meeting announcements, agendas and minutes with the Bureau Management team via the Team Liaisons or Chair. Notification will be accomplished through E-mail.

2016-17 WORK PLAN

2016-17 Wildlife Health Program Work Plan

Administrative work items	Status
Renew contract with Cornell College Of Veterinary Medicine for Wildlife Health Services	Completed
New federal aid in sportfish and Wildlife Restoration Grant for Wildlife Health (W-178-R)	Completed
Participate in Wildlife Health related meetings (IRC, CWD, BOW)	Completed
Provide Wildlife Health Consultation (public, staff, partners, regulatory, SLU licenses, etc.)	Completed
Annual Wildlife Health Program report	Completed
Biannual Wildlife Health Program review (central office or Cornell)	Completed
Wildlife Resources Center (WRC) Infrastructure, Equipment Management And Maintenance	Completed
WRC Incinerator Operation, Lab Maintenance, Facility Maintenance And Grounds	Completed
Administration: budgeting, fiscal, personnel, T&A, LATS, FMIS	Completed
Secure approval for Wildlife Health Strategic Plan 2016-2021	In progress
Create guidance document for facilities and equipment	In progress

Health and Disease Surveillance work items	Status
Case management and reporting: Wildlife necropsies (>1000/yr)	Completed
Maintain wildlife health website and case data access (Cornell)	Completed
Participate with Northeast Wildlife Disease Cooperative as a partner	Completed
Collaborate and coordinate with federal agencies on wildlife health issues under the One Health approach (USDA Program Standards, participation at USAHA meeting, SFD at NCTC)	Completed
Wildlife rehabilitation, NWCO, and Game Bird electronic data capture and analysis	In progress

Disease Prevention and Response work items	Status
2016 CWD surveillance (sample collection, Taxidermy Partnership Program, reporting)	Completed
CWD prevention plan put out for public comment	In progress
CWD Risk Assessment for 2017 CWD Surveillance	In progress
Amend CWD regulation (Part 189) as per CWD Prevention Plan	Pending approval

Training, Teaching, and Outreach work items	Status
Furbearer necropsy workshop and sample collection training	Completed
Wildlife Disease Association 2016 international meeting hosted by Cornell University	Completed
2016 Safe Capture International chemical immobilization training	Completed
Develop field guide to wildlife diseases (manual, webpage)	Completed
Wildlife health and wildlife rehabilitators listserv maintenance	Completed
Wildlife health presentations for public (NYSCC, NY Bowhunters, NYS Rehabilitation Council)	Completed
Training workshops for DLE staff	Completed
Communicate with veterinarians regarding wildlife health issues	Completed
Provide wildlife disease response coolers for regional offices and maintain inventory	Completed
Forensic services for DLE	Completed
Biennial Regional Training Workshops	Completed

Research work items	Status
Moose population health assessment	In progress
Bear mange statewide surveillance	In progress
Development of eDNA tools for amphibian and virus detection (yr 2)	In progress
Brainworm study report and development of a brainworm test for cervids	In progress
Hellbender vaccination field trial in Allegany River	In Progress

Policy Support work items	Status
Chemical immobilization policy document (AFWA guidance document)	In progress
Problem Wildlife SOP	Deferred 2017-18

Instructors:

Kevin Hynes, Wildlife Health Unit, Delmar
Elizabeth Bunting, Animal Health Diagnostic Center, Cornell
Krysten Schuler, Animal Health Diagnostic Center, Cornell
Niki Dean, Animal Health Diagnostic Center, Cornell

Agenda:

Wildlife Health Program Review
Wildlife Health Website Demonstration and Discussion
Personal Protective Equipment and Safe Handling
Equipment Disinfection Protocols
Wildlife Disease Research Projects: Hellbenders, eDNA, LPDV in Turkeys, Moose Health
Lunch and Discussion of Facilities and Needs for Wildlife Health Work
Emerging Disease Issues: BSal, Chronic wasting disease, Avian influenza
Disease Response and Biosecurity Tabletop/Field Exercise
Adjourn

Handouts:

BSal fact sheet
Disinfection Protocol
Wildlife Disease Response Plan

Wildlife Health Submissions:

www.nwdc.wildlifesubmissions.org
Select: Cornell University or WHU/NYSDEC

Goals for 2017-18

Continue to revise and develop the CWD surveillance program and the CWD risk minimization plan.

Develop a general field response plan for disease outbreaks.

Participate in moose research by live moose disease surveillance and moose mortality investigation, including collection of biological and genetic samples to support other projects.

Develop and present additional training materials for BOW staff in areas of interest (euthanasia guidance, personal protection equipment).

Write a complete policy for chemical immobilization of wildlife by BOW staff, including drug handling, field response, and staff training requirements and, if available, employ AFWA chemical immobilization document.

Implement ordering system for Wildlife Health related PPE and supplies to be ordered through the Wildlife Health Unit in Delmar.

Guidance document for facilities and equipment necessary for wildlife health specimen processing and packaging

Provide input to the Big Game Team, in development of guidance for authorization to hold fawns past the standard release date on Rehabilitation Permits

Working with the Big Game Team, develop a list of medications requiring ear tagging of rehabilitated deer fawns

2017-18 Wildlife Health Program Work Plan

Administrative work items

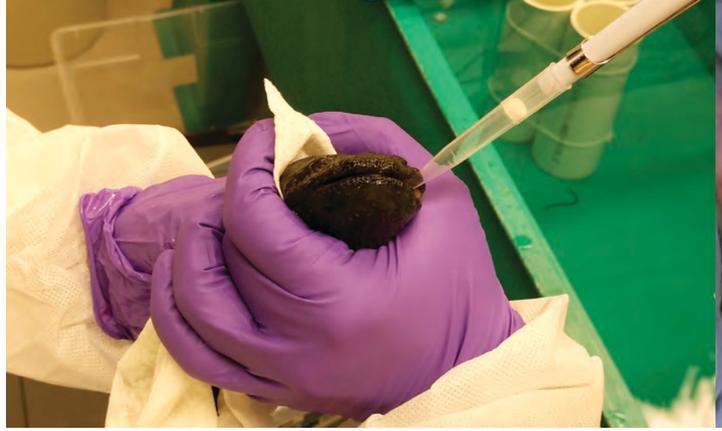
- 5-year CWD Risk Assessment Update for CWD Surveillance Plan
- CWD Risk Minimization Plan out for public comment
- Amend CWD regulation (Part 189) as per Risk Minimization Plan
- Create training module for new hires on wildlife health website
- Create guidance document for facilities and equipment
- Advanced topic workshop for Staff (Biosecurity, Research planning, Diseases, Herp Health Symposium)
- Virtual Tissue Bank Website (in partnership with NWDC)

Policy Support work items

- Maintain wildlife health website and case data access (Cornell)

Health and Disease Surveillance work items

- Northeast bald eagle lead poisoning retrospective (publication product)
- Furbearer training at NYSDEC Fur School
- Chemical immobilization policy document (AFWA guidance document)
- 2017 Safe Capture International chemical immobilization training
- 2017 CWD surveillance (sample collection, Taxidermy Partnership Program, reporting)
- Development of eDNA tools for amphibian and virus detection (yr 3)
- Brainworm study report and development of a brainworm test for cervids



Disease Prevention and Response work items

- Hellbender vaccination field trial in Allegany River
- Moose population health assessment
- Bear mange statewide surveillance (publication product)
- P.tenuis study final report
- Brainworm study report and development of a brainworm test for cervids

Training, Teaching, and Outreach work items

- Case management and reporting: Wildlife necropsies (>1000/yr)
- Participate with Northeast Wildlife Disease Cooperative as a partner
- Wildlife Resources Center (WRC) infrastructure, equipment management and maintenance
- WRC incinerator operation, lab maintenance, facility maintenance and grounds
- Administration: budgeting, fiscal, personnel, T&A, LATS, FMIS
- Training workshops for DLE staff
- Communicate with veterinarians regarding wildlife health issues
- Collaborate and coordinate with federal agencies on wildlife health issues
- Forensic services for DLE

Research work items

- Participate in wildlife health related meetings IRC, CWD, BOW, Wildlife Health and other meetings
- Providing wildlife health consultation (public, staff, partners, regulatory, research projects, SLU licenses, etc.)
- Annual Wildlife Health program report
- Biannual wildlife health program review (Central Office or Cornell)
- Wildlife rehabilitation, NWCO, and Game Bird electronic data capture and analysis
- Wildlife health and wildlife rehabilitators listserv maintenance
- Wildlife health presentations for public

PUBLICATIONS AND PRESENTATIONS

Publications

Alger, K., **Bunting, E. Schuler, K.**, Whipps, C. M. 2017. Risk Factors and Spatial Distribution of Lymphoproliferative Disease Virus (LPDV) in Wild Turkeys (*Meleagris gallopavo*) in New York State. Journal of Wildlife Disease. Online March 27, 2017

T.K. Hattenrath-Lehmann; **R.J. Ossiboff;** C.A. Burnell; C.D. Rauschenberg; **K. Hynes**; R.L. Burke; **E.M. Bunting**; K. Durham. 2017. The role of a PSP-producing Alexandrium bloom in an unprecedented diamondback terrapin (*Malaclemys terrapin*) mortality event in Flanders Bay, NY, USA. Toxicon. 129 36-43.

Schuler, K., Wetterau, A., Bunting, E., Mohammed, H.O. 2016. Exploring Perceptions about Chronic Wasting Disease Risks among Wildlife And Agriculture Professionals and Stakeholders. Wildlife Society Bulletin. 40 (1): 32-40.

Decker, D., **K.L. Schuler,** M.A. Wild, and A. Forstchen. 2016. Wildlife health and public trust responsibilities for wildlife resources. Journal of Wildlife Diseases 52:775-784. DOI: 10.7589/2016-03-066

Lorch, J., S. Knowles, J. Lankton, K. Michell, J. Edwards, J. Kapfer, R. Staffen, E. Wild, K. Schmidt, A. Ballmann, D. Blodgett, T. Farrell, B. Glorioso, L. Last, S. Price, **K. Schuler,** C. Smith, J. Wellehan, Jr., D. Blehert. 2016. Snake Fungal Disease: An Emerging Threat to Wild Snakes. Submitted by invitation to Philosophical Transactions B. 371(1709). DOI:10.1098/rstb.2015.0457

Justice-Allen, A., K. Orr, T. G. Schwan, **K. Schuler,** C. Meteyer, K. McCarty, and K. Jacobson. 2016. Bald eagle nestling mortality due to tick parasitism and successful management with nest replacement. Journal of Wildlife Diseases 52:940-944.

Decker, D., C. Smith, A. Forstchen, D. Hare, E. Pomeranz, C. Doyle-Capitman, **K. Schuler**, and J. Organ. 2016. Governance principles to guide wildlife conservation in the 21st Century. Conservation Letters DOI: 10.1111/conl.12211

The NYSDEC Wildlife Health Program Presentations at the 2016 Wildlife Disease Association Conference

Presentations

Wildlife health and public trust responsibilities for wildlife resources
D. Decker, **K. Schuler,** A. Forstchen, M. Wild, W. Siemer

Exploring perceptions about chronic wasting disease risks among wildlife and agriculture professionals and stakeholders
A. Wetterau, K. Schuler, E. Bunting, H. Mohammed

Health assessment of free-ranging chelonians in an urban section of the Bronx River, New York
A. Aplasca, V. Titus, **R. Ossiboff**, L. Murphy, T. Seimon, K. Ingerman, W. Moser, P. Calle, J. Sykes

Necropsy findings for bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) found dead in New York from 2000 to 2015. **K. Hynes, J. Okoniewski**

Epidemiology and genetic analysis of lymphoproliferative disease virus (LPDV) of wild turkeys (*Meleagris gallopavo*) in New York
K. Alger, **E. Bunting, K. Schuler**, C. Whipps

Poisonings with chlordane and dieldrin in New York State in the 21st century
J. Okoniewski, A. Gudlewski

The Northeast Wildlife Disease Cooperative
J. Ellis, W. Cottrell, N. Robinson, S. Frasca, R. Burns, **K. Schuler,** I. Sidor, A. Lichtenwalner, A. Leone, S. Swist, A. Patil, L. Murphy

The Eastern hellbender and *Batrachochytrium dendrobatidis* (Bd) in western New York
N. Dean, R. Ossiboff, E. Bunting , K. Schuler, A. Rothrock , K. Roblee

Evaluation of Russel's Viper Venom as a Test of Coagulation in Red-Tail Hawks (*Buteo jamaicensis*) T. Weisbrod, S. Kaye, N. Abou-Madi, M. Brooks, **E. Bunting**.

Poster

Survey for anticoagulant rodenticides in raptors from New York City, 2012-15. **J. Okoniewski**, P. Furdyna, C. VanPatten, **K. Hynes**

Dr. Beth Bunting giving instruction at the Region 6 training workshop.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