WILDLIFE EPIDEMIOLOGY LAB

ANNUAL 2025 REPORT

Wildlife Epidemiology Laboratory

Director's Message

Conservation and conservation education has not been anymore important than right now. In 2025, several threats to conservation emerged, such as threats to the Endangered Species Act, decreased funding for conservation, and more difficult conditions for higher education. It has never been more important for us to be good at what we do.

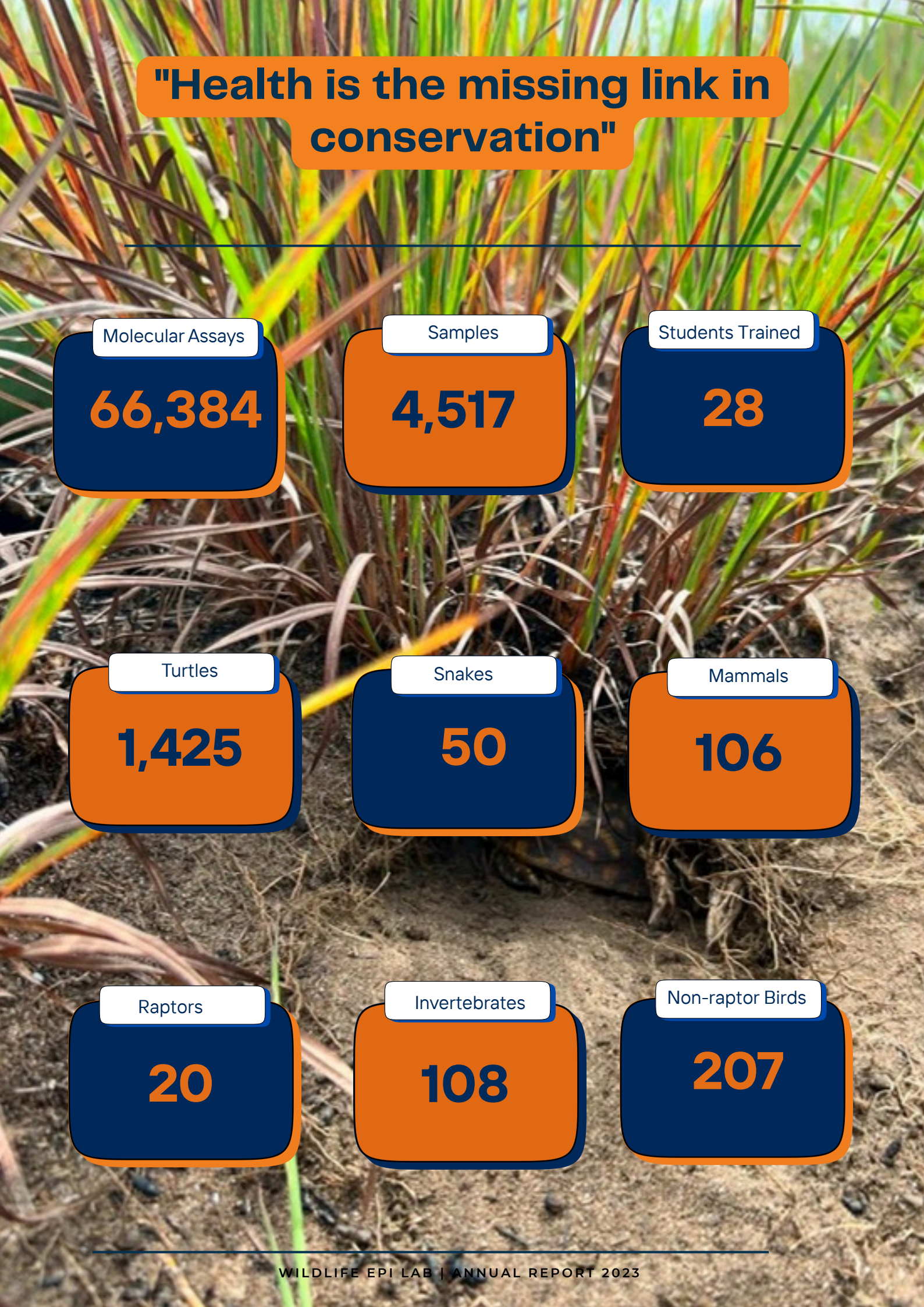
For these reasons, I am very grateful to be working with a dedicated and passionate team of professionals. This past year we have continued to advance conservation outcomes by integrating health metrics into local, state, and national objectives. Health is often the missing link in conservation programs, but being part of a large collaborative effort in Illinois that not only includes health assessment, but relies on it is very rewarding. I am so thankful to our partners, especially the Forest Preserves of Cook County, Lake County Forest Preserve District, Forest Preserve District of Kane County, Brookfield Zoo Chicago, Illinois Department of natural Resources, Wild Animal Health Fund, Walder Foundation, and many others.

In 2025, we saw the **first ever** Emydomcyes-negative status in Blanding's turtle headstarts. This has been a 3 year long trial involving multiple partners in a truly unique treatment trial. The first negatives were released into a soft-release pen this past year in hopes that a treatment to this often-fatal disease has been found.

I look forward to a great 2026 in which we will be welcoming our third ACZM-compliant free-ranging wildlife resident, an expanded investigation of wood ducks in Illinois, and the continuation of the world-class chelonian health investigation.

Thanks for all of your support and collaboration!

"Health is the missing link in conservation"



Molecular Assays	Samples	Students Trained
66,384	4,517	28

Turtles	Snakes	Mammals
1,425	50	106

Raptors	Invertebrates	Non-raptor Birds
20	108	207

IMPACT REPORT

ADVANCING THE FIELD

Our team published peer-reviewed manuscripts, wrote book chapters, presented at international conferences, and developed new techniques for assessing wildlife health

26 Manuscripts

17 National and International Presentations

4 PhD and MS Graduate degrees conferred

PROJECTS	DETAILS	OUTCOME
IDNR State Wildlife Grant	Assessing health of herptiles in Illinois	Advanced knoweldge of health factors in conservation
Penguin Health in Punta San Juan	Describe Wellness of Humboldt penguins in Peru	Identified circoviruses and multiple Mycoplasmas
FPCC Wildlife Health	Assess health of all wildlife in Cook county	Characterized trends and mortality rates due to viruses in multiple taxa
Walder Foundation	Assess health of all turtles in Chicagoland	Identified viruses and bacteria in new species, performed lots of exams
Morris Animal Foundation	Monitor ornate box turtles over a field season	Described trends in health and determined baseline survival rate at multiple sites in Illinois
Morris Animal Foundation	Assess epidemiology of skin fungal diseases in snakes	Identified Paranannizziopsis in freeranging snakes for the first time in Illinois

ACKNOWLEDGEMENTS

Numerous supporters including Illinois Department of Natural Resources, Brookfield Zoo Chicago, Forest Preserves of Cook County, Lake County Forest Preserve District, Forest Preserve District of Kane County, Walder Foundation, Morris Animal Foundation, Wild Animal Health Fund, AZA SAFE Program, San Diego Zoo Wildlife Alliance

Promoting the health and conservation of reptile, amphibian, mammalian, invertebrate, and avian populations in the wild and under human care through epidemiology research and veterinary medicine

BOX TURTLE PROJECT

YEAR 17

"Box turtles are the signature species on the planet." - Matt Allender

Eastern box turtles are the species of focus for our longest running health assessment project. This work started in 2007 in Tennessee, expanded to Illinois in 2012 and has been performed in every year since.

Ninety individuals were examined in 2025. There was a range of health diseases identified.

More information was gathered on *Terrapene* herpesvirus 2, a historically oncogenic (cancer-causing) virus. It seems to be much more prevalent than previously thought.

Ornate box turtles were again evaluated at five sites in 2025.

There is a larger diversity of adenoviruses in ornates than previously thought. New assays to detect these different viruses were created.

Aquatic Turtle Health Assessments

Aquatic turtle health assessments dominated 2025 for the lab. A total of >1300 turtles were examined by the teams in Lake, Kane, Cook, Will, and DuPage counties. This is the most in any year!

Walder Foundation

Dr. Adamovicz received a 3 year grant from the Walder Foundation that largely accounted for the increased caseload. Her goals are to use chelonians as sentinels of ecosystem health.

Illinois Department of Natural Resources

WALDER FOUNDATION

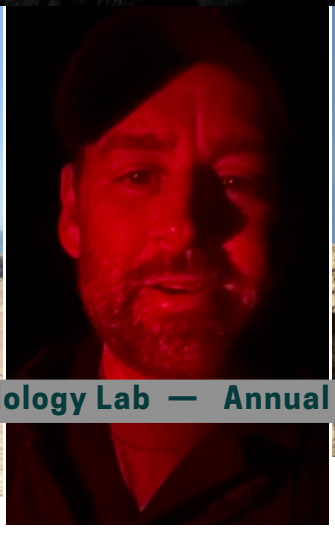
PUNTA SAN JUAN PROJECT

Another year for the wildlife at PSJ and another year that they had to cope with one of the most deadly Avian Influenza outbreaks. The team in Peru remained amazing and executed a collaborative response to sample >80 Humboldt penguins in 2025. All samples are back in the US at the lab where we are busy analyzing them!

The populations remain lower than historical sizes, which is likely due to the combined effects of El Nino, HPAI, and potential nest predators (rats) at the site. Interestingly, new viruses were discovered in penguins in the last couple of years, including circoviruses, as well as bacteria like a diverse set of Mycoplasmas.

In 2026, an expansion of PSJ penguin health assessments are planned to tease out the importance of health factors in conservation of this species.

The PSJ work is a tremendous collaboration between the Punta San Juan Program at Cayetano University in Peru, Brookfield Zoo Chicago, and WEL. It is a rewarding process and we are excited to play our small role. In 2026, two residents got to experience PSJ for the first time.



ACZM WILDLIFE RESIDENCY

THE ONLY ACZM COMPLIANT RESIDENCY PROGRAM FOCUSED ON FREE-RANGING WILDLIFE CONTINUES TO BE VERY SUCCESSFUL. THE PARTNERSHIP WITH THE FOREST PRESERVES OF COOK COUNTY AND BROOKFIELD ZOO CHICAGO CONTINUES TO ADVANCE HEALTH OF URBAN WILDLIFE.

BROOKFIELD ZOO CHICAGO

In 2025, nearly 1000 animals were examined by a veterinarian or veterinary student, consisting of reptiles, invertebrates, mammals, and birds representing more than 75 species!

1. The first resident completed the program successfully
2. Identification of a gammaherpesvirus in white-tailed deer
3. Started underwater monitoring of aquatic turtle presence in high conservation areas
4. Began developing an assay for newly discovered American Kestrel adenovirus 1
5. Presented at 2 international conferences: Wildlife Disease Association and American Association of Zoo Veterinarians.
6. Mentored veterinary student summer fellows developing critical teaching skills.

Raccoons

In the spring, we partnered with Brookfield Zoo Chicago, University of Illinois anesthesiologists, and USDA biologists to perform a health assessment tied with an anesthesia study. The results of this project give biologists and veterinarians options for safe capture of this species. Additionally, pathogen results indicate presence of pathogens never seen before in Illinois in raccoons.

Wood Ducks

For the fourth year in a row, FPCC biologists and veterinarians evaluated wood ducks in Cook county. Previously, we identified an adenovirus in this population and in 2025, there was increased prevalence. Additionally, after several years of finding nodules with no known cause, we detected a novel avipoxvirus in foot nodules in 2025. And finally, recapture of two individuals is providing insight to the clinical progression of pododermatitis in free-ranging wood ducks

EMYDOMYCES OUTBREAK

Phase 3 was initiated in 2025 for the treatment of Emydomyces in Blanding's turtles

0%

POSITIVE ANIMALS AT END OF 2025

PHASE 3

In 2025, the first 20 headstart Blanding's turtles remained negative for more than 6 months without treatment. In conjunction with Lake County Forest Preserve District and Illinois Department of Natural Resources, these individuals were moved into an outdoor soft-release contained habitat and monitored. If truly negative in 2026, these will be the first wild turtles successfully treated for this disease and a huge step forward for conservation.

PUBLICATIONS AND PRESENTATIONS

Multiple diagnostic modalities are appropriate for detecting *Nannizziopsis guarroi* in experimentally infected bearded dragons (*Pogona vitticeps*)

Amanda D. Wong[1,2], Laura Adamovicz[1,2], Jacob P. Dalen[2], Alexander M. Bender[2], Michael F. Rosser[3], Denise M. Imai[3], Karen A. Terio[4], Jennifer M. Reinhart[1], Matthew C. Allender[1,2,5] and Krista A. Keller[1,2,6]*

Epidemiology of Sulawesi Tortoise Adenovirus in Free-living Blanding's Turtles (*Emydoidea blandingii*), Painted Turtles (*Chrysemys picta*), and Red-eared Sliders (*Trachemys scripta elegans*) in Illinois, USA

Zachary C. Ready,[1,2,8] Laura Adamovicz,[1] Maris Daleo,[1] Amber Simmons,[1] Gary Glowacki,[3] William Graser,[4] Chris Anchor,[5] Dan Thompson,[6] and Matthew C. Allender[1,7]

Development of a validated quantitative polymerase chain reaction assay and fungal culture for the diagnosis of *Macrorhabdus ornithogaster* in budgerigars (*Melopsittacus undulatus*)

Danielle M. Lang, DVM[1-3*]; Laura A. Adamovicz, DVM, PhD[1,4]; Chien-Che Hung, DVM, PhD, DACVM[3,4]; Katie W. Delk, DVM, DACZM[2]; Jennifer N. Langan, DVM, DACZM, DECZM[2,3]; Sathya K. Chinnadurai, DVM, MS, DACZM, DACVAA, DACAW[2]; Matthew C. Allender, DVM, PhD, DACZM[1-4]

Evaluation of RT-LAMP for SARS-CoV-2 Detection in Animal Feces

Aimee Pepper [1], Sandipty Kayastha [1], Megan Miller [2], Jake Guag [2], Andriy Tkachenko [2], Matthew Allender [1], Karen Terio [3] and Leyi Wang [1,*]

Developing and validating a multiplex hydrolysis probe-based quantitative PCR assay for the detection of four pathogens in chelonians

Maris J. Daleo [a,*], Matthew C. Allender [a,b]

Health assessment of non-native red-eared sliders (*Trachemys scripta elegans*) and their impact potential on native species

John M. Winter[1,2,3*], Kaitlin Moorhead[1], Kamila Grochowski-Grum[1], Chris Anchor[2], Jennifer A. Landolfi[4], Laura A. Adamovicz[1,5], Matthew C. Allender[1,3,5]

PATHOGEN SURVEILLANCE IN MUSK TURTLES (*STERNOTHERUS* SP.) IN ALABAMA

Stephanie McCain, DVM, DACZM, Anne E. Rivas, DVM, DACZM, A. Joseph Jenkins, MS, Seamus O'Brien, BS, Grover J. Brown, PhD, Laura Adamovicz, DVM, PhD, and Matthew C. Allender, DVM, MS, PhD, DACZM

SARS-CoV-2 Serological Surveillance of Both Vaccinated and Unvaccinated Zoo Animals with the Identification of a Sloth Bear and a Tapir with Previous Infection

Marie Arvidson [1], Yashaswi Raj Subedi [2], Sandipty Kayastha [1], Angel Mitchell [1], Kami Alvarado [1], Xufang Deng [2], Karen Terio [4], Matthew Allender [1,3,4] and Leyi Wang [1,*]

A longitudinal analysis of pathogen shedding patterns in confiscated eastern box turtles

Maris J. Daleo[1] | Lilia Medvedev[1] | Carly R. Harkey[1] | Amber L. Simmons[2] | Kaitlin M. Moorhead[1] | Emily R. Whitmer[1] | Martha A. Delaney[3] | Laura A. Adamovicz[1] | Dave Collins[4] | Matthew C. Allender[1,5]

roficiency test of SARS-CoV-2 Omicron variant detection diagnostics samples by veterinary diagnostic laboratories

eha Singh[1] · Megan R. Miller[2] · Sarah M. Nemser[2] · Andriy Tkachenko[2] · Steffen Uhlig[3] · Kirstin Frost[3] · rina Hettwer[3] · Jodie Ulaszek[1] · Matthew Kmet[4] · Leyi Wang[5] · Matthew C. Allender[5,6] · Ravinder Reddy[4]

Evaluating the Efficacy of Disinfectant Methods against *Emydomyces testavorans*, a Fungus Associated with Shell Disease in Freshwater Aquatic Turtles

Nicholas C. Liszka,[1,4] Laura Adamovicz,[1,2] Kaitlin A. Moorhead,[1] Maris J. Daleo,[1,2] Kamila Grochowski,[1] and Matthew C. Allender[1,2,3] [1]Wildlife Epidemiology Laboratory, University of Illinois College of Veterinary Medi-

Detection of Adenoviruses in Free-Ranging Blanding's Turtles (*Emydoidea blandingii*), Painted Turtles (*Chrysemys picta*), and Red-Eared Sliders (*Trachemys scripta elegans*) in Illinois, USA

Zachary C. Ready,[1,2] Laura Adamovicz,[1] James F.X. Wellehan,[3] Maris Daleo,[1] Amber Simmons,[1] Gary Glowacki,[4] William Graser,[5] Chris Anchor,[6] Dan Thompson,[7] and Matthew C. Allender[1,8]

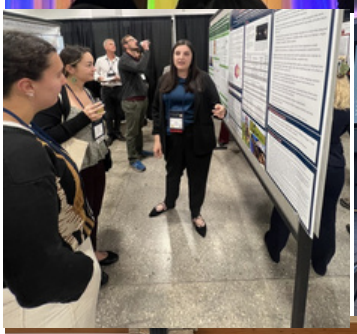
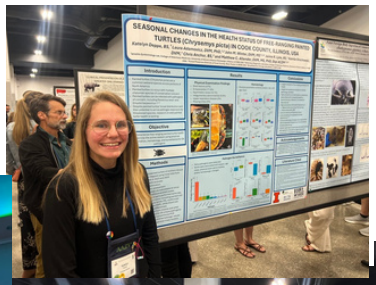
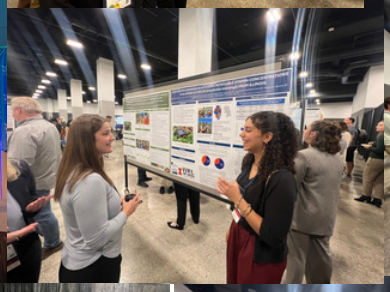
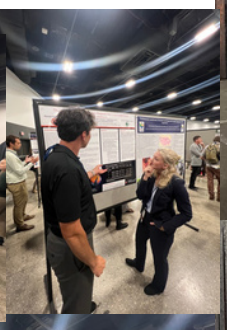
Comparison of Rapid Antigen Test and Quantitative PCR for Detection of Highly Pathogenic Avian Influenza Virus in Free-Ranging Peruvian Seabirds

Caitlin M. Hemby,[1,5] Matthew C. Allender,[2] Susana Cárdenas-Alayza,[3,4] Sandipty Kayastha,[2] Leyi Wang,[2] and Julie D. Sheldon[1] [1]Department of Small Animal Clinical Sciences, University of Tennessee College of Veterinary

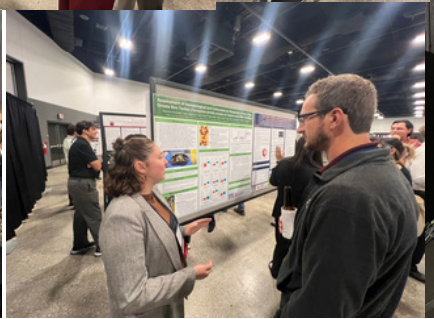
Characterizing the Performance of Multiple Testing Modalities to Detect *Emydomyces testavorans* in Blanding's Turtles (*Emydoidea blandingii*)

Kaitlin A. Moorhead,[1,7] Dylan M. Burke,[1] Laura A. Adamovicz,[1,2] Gretchen C. Anchor,[3] William Graser,[4] Gary Glowacki,[5] and Matthew C. Allender[1,2,6]








TRAINING AND TEACHING

Training the next generation of wildlife health professionals

Lots of projects this year, we had the most WEL summer fellows ever! Each student gets a project that they lead all the way to a first-authored paper. This develops skills in project development, logistics, analysis, and writing. Crucial skills for any veterinarian.

Proud of all the graduates!









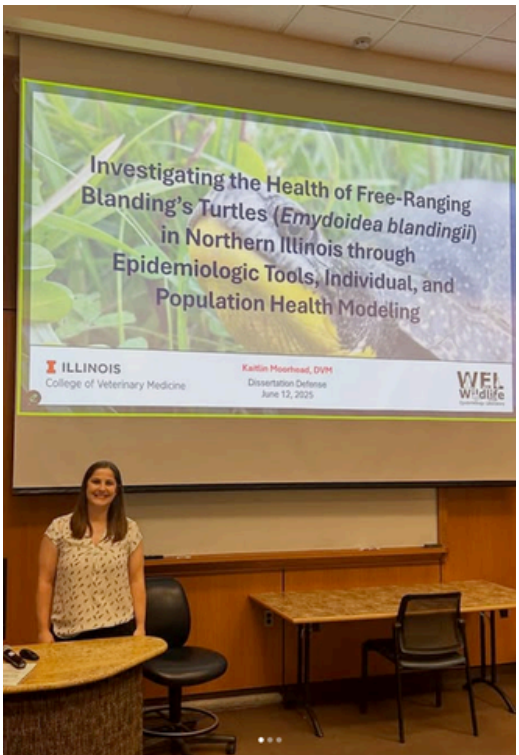




2025

TOP INSTAGRAM POSTS

2368 FOLLOWERS!



WILDLIFE EPIDEMIOLOGY LAB

Director
Dr. Matt Allender

Co-Director, Diagnostic Development and Surveillance
Dr. Laura Adamovicz

WEL Research Technician
Amber Simmons
Crystal Moreno-Garcia

BZC Veterinary Technician
Jessica Delbovo

Graduate Fellows
Dr. Kaitlin Moorhead
Dr. Maris Daleo
Dr. John Winter
Dr. Megan Colburn

Post-Graduate Fellows
Dr. Stephanie Brien

ACZM Residents
Dr. John Winter (IZWHMR)
Dr. Danielle Lang (IZAAR)
Dr. David Minich (IZAAR)
Dr. Eliza Baker (IZWHMR)
Dr. Maya Iyer (IZAAR)
Dr. Lauren Vincent (IZAAR)

Undergraduate Student
Sophia Vodnik
Julia Persak

2025 Summer Veterinary Fellows
Angie Berg
Maddie Brookings
Jenna Camargo
Becca Chenoweth
Ryland Darling
Carly Etter
Maddy Kasbaum
Grace Minge
Erika Suniga
Sophie Vodnik (undergrad)
London Wimberly

Veterinary Research Team Members
Turtle and Snake Teams
Maddie Brookings, Erika Suniga, Carly Etter, Becca Chenoweth, Ryland Darling, Grace Minge, Jenna Camargo, Javelis Marin Castro, Jaime Lyke, London Wimberly, Grace Daab, Maddy Kasbaum, Sophia Vodnik, Julia Persak, Tatum Yocum, Marg Bednarek, Kate Deppe, Shari Markowitz, Samantha Johnson

Box Turtle Team 2025

Grace Daab, Toni Kim, Katelyn Smoot, Sarah Johnson, Fiona Ferry, Alexus Day, Hunter Huang, Eanna Gou, Emily Jorgensen, Julia McConnell, Jennifer Cortes, Shelby Harrison

Social Media

Maddie Brookings