

Institute for Conservation Medicine Newsletter

Winter 2025



Dr. Sharon Deem with Stella the opossum

Director's Message

Director, Dr. Sharon L. Deem

As 2025 nears its end, I have been reflecting on the year and our many collaborative research programs, educational offerings, and conservation actions taken for healthy animals and healthy people. Through our work in North America, South America and Africa, we continued to deliver conservation actions

and to build global capacity with the One Health approach. Closer to home, our newest ICM member, Dr. Kaitlin Moorhead joined us in September. Kaitlin is the wildlife veterinarian for the Forest Park Living Lab. I hope you enjoy reading this newsletter, and please feel free to reach out if you want to talk about wildlife conservation, human public health, and/or environmental sustainability.

Animal Spotlight

Didelphis virginiana

Virginia Opossum

- Only marsupial native to the United States
- Omnivore
- Solitary, nocturnal
- Excellent climbers
- Have opposable thumbs on their hind feet



- Give birth after less than 2-weeks gestation. The honeybee-sized newborns climb into the mother's pouch & develop for 60 days.
- Opossums have fingerprints, just like humans. No two are alike.



FOREST PARK LIVING LAB

Forest Park is a thriving ecosystem right in the middle of Saint Louis. Our beautiful park is home to 210 species of birds, 23 species of reptiles, and 20 species of mammals.

Together with the greater St. Louis community, the Forest Park Living Lab studies the health, movement, diversity, and interactions of a rich collection of species right here in Forest Park.



Hello, I am Cooper
a Red-tailed Hawk

Project Objectives

1. Attach GPS trackers to individuals of several focal species
2. Collect health and disease data on all of the individuals in the study
3. Show the movement of biodiversity in an urban park that will be useful to both science and society
4. Develop outreach and education efforts in the St. Louis region to connect students to urban biodiversity



Featured Project

Forest Park Living Lab (FPLL)

One of our favorite projects is based right here in St. Louis. In 2020, we created the Forest Park Living Lab (FPLL). Our team of conservation scientists and veterinarians work together to study urban wildlife (continued on p.2).

See the latest FPLL news on forestparklivinglab.org.

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Project Updates

Forest Park Living Lab

ICM interns Dani W. and Isabel L., along with SLU student, Isabella C., created a booklet of conservation activities for children. The booklet was a huge success with patients at the children's hospital this summer.

[Check out the activity book on the FPLL website.](#)



In September, Dr. Kaitlin Moorhead joined the ICM team as a Wildlife Veterinary Fellow. She has hit the ground running and is already having a big impact on the FPLL. (More about Kaitlin on p.6). Welcome, Kaitlin!

We have been doing a small mammal study in Forest Park. We are interested in evaluating the health of free-living raccoons and opossums through a community health framework to understand the impacts on other

local wildlife, humans and managed animal populations (both domestic and zoo collection).



Sharon, Kaitlin and Jamie in Forest Park collecting health data on an opossum.

One zoonotic disease we are surveying for is *Trypanazoma cruzi*, the parasite that causes Chagas disease (sometimes known as "kissing bug disease") in animals and humans.

DID YOU KNOW?

Forest Park is home to many Missouri and Illinois state animals. Such as...

- The Three-Toed Box Turtle is the state reptile of Missouri and is a large focus of our research in the park.
- Illinois is represented by their state animal/mammal, the [White Tailed Deer](#).



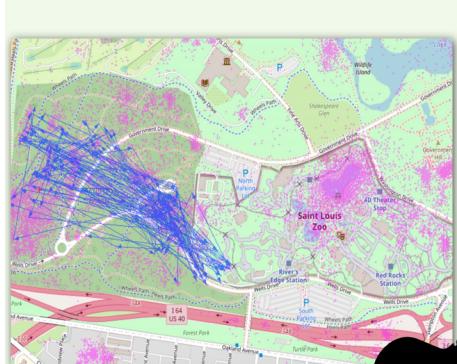
Forest Park Wildlife

Horned Owl
Raccoon
Blue Heron

Snapping Turtle
Cardinal
Leopard Frog

White Tailed Deer
Wood Duck
Opossum

Z T F X V S W F P U L A T D L G J S K J
E L O P O S S U M E Y I C K S J V D B I
B D N B D Y W W U G F E N A X J S I O S
E Y J B H G E M Q N L X R D R W M Y P A
U S Y Z N V Q B A H M C W F S D V I P S
O K G I L Q W S E R Y A F M I A I G U Z
S I A J H S K V F Q S G Z A V F N N O Q
O G L Z F S N K T L L B W X V I R D A F
X J Z B O J P E E U C S Y H Y O G L C L
X V R E O S K N B W O O D D U C K E F M
O S B C I O C R Z T G C T T Y K J O P D
R Q E E B F Y Z B L U E H E R O N P C R
L X A S N A P P I N G T U R T L E A P A
H J D P J Y D C Q F O X F A C N Y R M C
D H U D F S V Q A F B J V E P O N D Y C
P I U U L E S I L A M A F F T P J F H O
O Q A J V Q N R B P A A U V F W R R I O
L F I Q Q O H O R N E D O W L N G O F N
U W F I R W H G N P W R P E V K C G K X
V W H I T E T A I L E D D E E R Y M V B



This map shows real movement data from a raccoon (pictured by the blue lines) living in Forest Park.



Raccoons are fitted with GPS tags, and their movements are recorded periodically. This allows for data to be collected without the need for direct human contact.

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Cuban Crocodiles*

We partnered with Mazuri to provide supplemental food for the crocodiles at the Zapata farm in Cuba. The first delivery of Mazuri crocodile biscuits successfully arrived in Cuba in August of this year. This is in response to the lack of food available for crocodiles living at the Zapata crocodile farm during this period of economic uncertainty in Cuba.

The Zapata crocodile farm and Libre Imagen hosted a crocodile festival in October for local Cuban families. The event was led by our partners at Libre Imagen. We support their art education after school program in the villages surrounding the Zapata swamp. They provide conservation focused art outreach for students in the region, free of charge.



Lázaro Sosa Morell teaches students in Cuba about crocodile conservation through art.

Galapagos Tortoise Movement Ecology Programme (GTMEP)*

We are very proud to share the most recent publication from our Galapagos Tortoise health work. In this paper, we provide reference intervals on hematology and plasma biochemistry values of tortoises on Isabela Island (full citation on page 5).

Partnering with Mariantú Robles, a veterinarian and Master's student at Pontifical Catholic University in Valparaíso, Chile, we have provided temperature dataloggers for deployment on sea turtles in Galapagos. Data collected from this study will be compared to our data from giant tortoises. We're very excited about this new project!

One Health in Brazil

This summer, Sharon and Kathleen traveled to Brazil to lead a 5-day molecular diagnostics and One Health workshop with didactic and laboratory sessions in collaboration with ICM adjunct veterinarian, Lilian Catenacci. The workshop included presentations on chelonian conservation and medicine topics from our research in Galapagos to Madagascar to emerging infectious and noninfectious diseases of Chelonians.



Sharon, Lilian and Kathleen presenting on One Health with the leadership at Federal University of Piauí.

We also met with local human and animal health leaders and Sharon gave a talk on the Zoo's work in One Health to the university. Additionally, they visited field sites in Brazil to look for ways to strengthen One Health collaborative efforts with Federal University of Piauí.



Kathleen and Lilian in the lab with students performing DNA extractions.

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St. Louis Box Turtle Program (SLBTP)*

Over the summer, our ICM Interns were a huge help with the SLBTP and other local programs. Together, they gained 200-hours of conservation medicine experience and developed many friendships and professional contacts. Here's what they said about their internship:

Dani W (in photo, left): "My favorite part of this internship has been the field work and tracking. I feel like I have grown a lot over this summer and learned valuable skills that will be useful for future opportunities. Practicing tracking has also helped boost my overall confidence and trust in my intuition."

Isabel L (in photo, center) "My favorite part of this internship has been creating an educational activity booklet for the St. Louis Children's Hospital and spending a morning doing activities with the kids. It was lots of fun."



Dani, Isabel and Sharon out tracking

Dani & Isabel also created some great SLBTP social media posts! Check them out on [Facebook](#) and [Instagram](#).



New ICM friends meet Freddy the box turtle

Madagascar Tortoises*

In August, we hosted two young Malagasy veterinarians, Mitia Andrianantenaina and Navalona 'Nav' Rakotobe. While in St. Louis, Mitia gave a presentation to Zoo staff on our pre-release health assessments for rewilding efforts in Madagascar. Jamie trained Mitia and Nav in hematology techniques and we introduced them to our local turtle species.

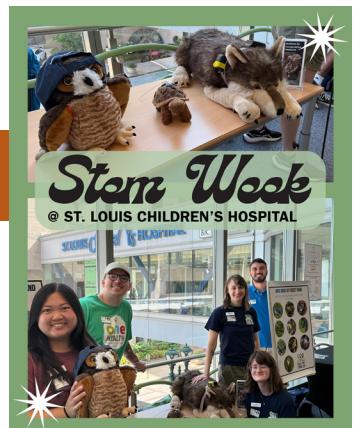


Box turtle tracking in Forest Park: (L-R) Kevin Alvarez, from the Bronx Zoo, Jamie, Nav and Mitia.

Outreach & Education

- FPLL has continued their public outreach efforts at community events around the St. Louis area.

This event is an annual favorite!



- Jamie & Grace had great success with their new interactive activity for the Zoo's STEAMZ Camp. The kids loved working with Jamie to track and put a GPS collar on a (plush) coyote.
- This fall, Sharon and the ICM team have given many guest lectures and on-site tours to local university classes from WUSTL and the University of Health Sciences & Pharmacy (UHSP).
- Grace engaged with visitors to the APA vaccine clinic, at the St. Louis Zoo Wildcare Park, about the importance of pet vaccinations.
- Sharon represented the ICM at the Zoo's Wild Night for WildCare event, sharing program info with Zoo friends and supporters.

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Professional Presentations

- Jamie gave two presentations at the Cuban Convention on Environment and Development in Havana:

Hematology & blood chemistry of the Cuban crocodile (*Crocodylus rhombifer*) at Zapata Crocodile Farm, Cuba. Palmer, J.L., Rodriguez, G.S., Fleitas, E.P., Augustine, L., and Deem, S.L.

Identification of diseases of Cuban crocodiles (*Crocodylus rhombifer*) in Cuba, and next steps.

Palmer, J.L., Apakupakul, K., Rodriguez, G.S., Fleitas, E.P., and Deem, S.L.

- Jamie gave two presentations at the annual Turtle Survival Alliance conference:

Incorporating pre-release health protocols in the Radiated tortoise (*Astrochelys radiata*) reintroduction program. Palmer, J.L., Leach, K., Raphael, B.L., Rakotonanahary, T., Nieto-Claudin, A., Perry, S. M., Andrianantenaina, M.K., Navalona, R.T., and Deem, S.L.

Ranavirus (Frog Virus 3) identified in Missouri turtle species, with a focus on Three-toed box turtles (*Terrapene mexicana triunguis*). Palmer, J.L., Apakupakul, K., and Deem, S.L.

- Kathleen & Sharon gave a 5-day Molecular Lab workshop in Piauí, Brazil.

Special thanks to Lilian Catenacci for arranging Sharon and Kat's teaching and speaking opportunities in Brazil.



- Sharon gave the keynote lecture, "One Health: Words to Action", at the Federal University of Piauí, Brazil.

In The News

- Sharon's article "The purpose behind the party: Celebrating giant tortoises at ZOOFARI" was featured in Saint Louis Zoo Magazine, Volume 41 (2025). https://issuu.com/stlzoo/docs/spring_2025_stlzoo_magazine

- Francis Howell High School journalism students published a multimedia project on the SLBTP. <https://fhntoday.com/2025/09/24/st-louis-zoo-research-project-contributes-data-that-aids-conservation-efforts/#>
- Sharon was interviewed on Brazilian TV regarding our Brazil One Health Collaborative Program. <https://www.youtube.com/watch?v=ptuVPh31qNc>

Publications

- Coury, K., Bronson, E., Venegas Cuzmar, C., **Deem, S.**, and Doyle, J.M. 2025. Mitochondrial genome of a Bolivian River Dolphin (*Inia boliviensis*). Mitochondrial DNA Part B: Resources. 10: 804-808. <https://doi.org/10.1080/23802359.2025.2544682>
- **Nieto-Claudín, A., Palmer, J.L., Brenn-White, M., Esperón, F., Cano, S., Deem, S.L.** 2025. Hematology and plasma biochemistry reference intervals of Galapagos tortoises from Isabela Island. Conservation Physiology 13, Issue 1. <https://doi.org/10.1093/conphys/coaf054>
- Perry, S.M., Merkel, J., **Palmer, J.L.**, Rakotonanahary, T.F., Raphael, B.L., O'Brien, S., Musgrave, K., Nelson, S., Vetter, R., **Nieto-Claudín, A., and Deem, S.L.** 2025. Establishment of reference intervals for blood lactate using point-of-care blood analysis in radiated tortoise (*Astrochelys radiata*). Journal of Zoo and Wildlife Medicine. 56: 717-724. <https://doi.org/10.1638/2024-0064>
- **Uiterwaal, S., Deem, S.L., Dell, T., Braude, S., O'Shea, M., Palmer, J.L., Parikh, S., Wise, A., Blake, S.** 2025. Space use and environmental drivers of Northern Raccoon (*Procyon lotor*) activity in an urban park: evidence for avoidance of road crossings. Journal of Mammalogy. 106, Issue 6. <https://doi.org/10.1093/jmammal/gyaf077>



Sharon at Serra da Capivara UNESCO World Heritage Site

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Employee Spotlight

Kaitlin Moorhead

DVM, PhD, Wildlife Veterinary Fellow, FPLL Lead Scientist

Kaitlin earned her DVM from the University of Tennessee College of Veterinary Medicine in 2020 and began her career as a small animal clinician before transitioning to wildlife research. Kaitlin has a passion for conservation and ecosystem health. She recently completed a PhD with the Wildlife Epidemiology Lab (WEL) at the University of Illinois. Her research focused on the health of the state-endangered Blanding's turtle.

Her favorite part of the job is being in the field – working with animals in their natural habitat. Kaitlin also enjoys collaborating with people from all different disciplines and specialties (biologists, ecologists, educators, students, etc.).



Dr. Kaitlin Moorhead and her dog Archer



Camera trap photo that made it to the cover of *Journal of Mammalogy* with our publication on raccoons in Forest Park.

We hope you enjoyed this newsletter. Thank you for being a friend of the ICM. Your support helps us continue our work and support for the next generation of conservation medicine practitioners.

If you would like to contribute to the ICM, please go to the Saint Louis Zoo website (stlzoo.org), select GIVE in the upper right, and select “General Gifts and Conservation Contributions” near the bottom. Under Ways to Give, use the dropdown menu to select the Institute for Conservation Medicine. We are also happy to accept paper checks mailed to:

Institute for Conservation Medicine
Saint Louis Zoo
P.O. Box 790290
St. Louis, MO 63179-0290

To learn more about how you can contribute to the future of the ICM, contact Director Dr. Sharon Deem at (314) 646-4708 or deem@stlzoo.org. Our wish list includes paid internships, post-doctoral fellows, and a mobile molecular lab to assist Dr. Lilian Catenacci with her One Health research in Brazil.

For more information on the Institute for Conservation Medicine, visit stlzoo.org/ICM.

Our Mission:

The Saint Louis Zoo Institute for Conservation Medicine takes a holistic approach to wildlife conservation, public health, and sustainable ecosystems to ensure healthy animals and healthy people.



Saint Louis Zoo

Institute for Conservation Medicine
Healthy Animals. Healthy People.