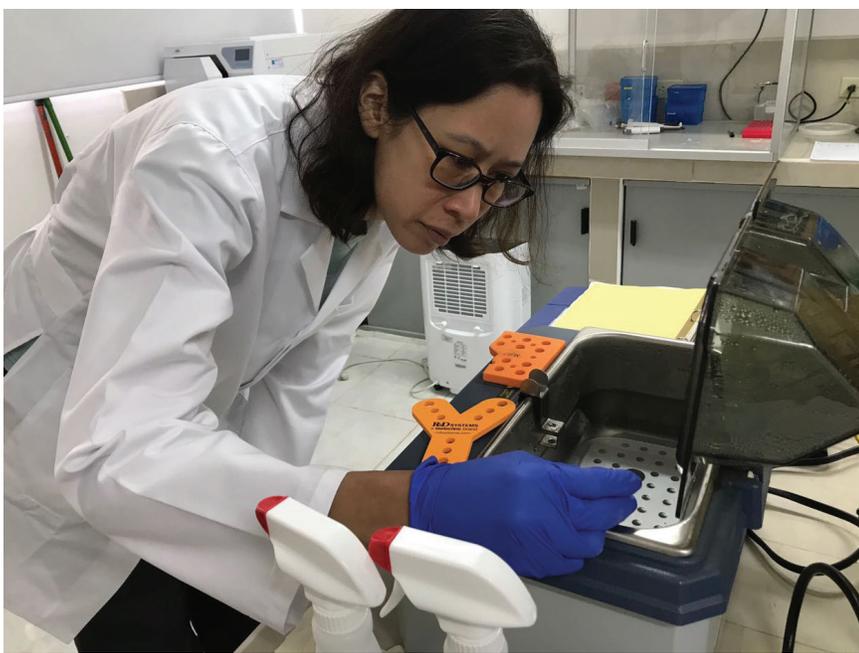


IMPACT REPORT

2025



Center for Chelonian Conservation

Background

The Saint Louis Zoo WildCare Institute Center for Chelonian Conservation (WCI CCC) has been dedicated to the conservation of chelonian species (turtles and tortoises!) since 2019. The Center was launched after years of chelonian conservation work by the Zoo's Institute for Conservation Medicine (ICM). Our work started in 2012 when we launched the St. Louis Box Turtle Project (SLBTP). Then, in 2013, ICM became a collaborating partner of the Galapagos Tortoise Movement Ecology Programme (GTMEP). In addition to these two founding projects, in 2020, we became a major player, partnering with the Turtle Survival Alliance and others to conserve endemic tortoises in Madagascar through the newly formed WCI CCC. But why have a Center dedicated to the conservation of chelonians? Firstly, turtles and tortoises are the most endangered vertebrate group on the planet, with more than 54% of the 356 species endangered with extinction. Chelonians are threatened by habitat loss and fragmentation, human use as pets and for food, climate change, and infectious diseases. And, because

turtles and tortoises are essential to ecosystems, with many species serving as “ecosystem engineers,” their loss has amplified impacts on the health of the environments where they live. Additionally, the health status of most chelonian species remains poorly understood. The WCI CCC supports the SLBTP (including box turtles and snapping turtles) in Missouri, and the endemic tortoise health program in southern Madagascar (Fig. 1).r. We integrate applied science, local capacity building, and an inspiring turtle-based outreach and education program to inform management decisions and engage local stakeholders in effectively conserving turtles and tortoises. Please enjoy this annual report of our accomplishments in 2025.

Location and Focal Species

Missouri	Box turtles and aquatic turtles
Madagascar	Radiated, spider and ploughshare tortoises
Galapagos Islands	Giant tortoises



Figure 1



Scientific Publications

Apakupakul K, Nieto-Claudin A, Rakotonanahary TF, Catenacci LS, Rasambainarivo F, Randrianarisoa S, Sacristán C, Madueño E, Raphael BL, Deem SL. 2025. Molecular Identification of *Mycoplasma agassizii* in Confiscated Tortoises in Madagascar. *Journal of Wildlife Diseases*. 61: 258-261.

<https://doi.org/10.7589/JWD-D-24-00040>

Brunner, T.J., Deem, S.L., Stevens, C., Romano Noriega, J. and Nieto Claudin, A. 2025. *Aphanoascella galapagosensis* Shell Lesion Coverage of free-living Galapagos tortoises: Implications for Health and Conservation. *Journal of Wildlife Diseases*. 61: 297-307.

Deem, S.L. 2025. The purpose behind the party: Celebrating giant tortoises at ZOOFARI. *Saint Louis Zoo Magazine*. 41: 20-21.

Nieto-Claudin, A., Palmer, J.L., Brenn-White, M., Esperón, F., Cano, S., and Deem, S.L. 2025. Haematology and plasma biochemistry reference intervals of Galapagos tortoises from Isabela Island. *Conservation Physiology*. 13: <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-Claudin, 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.

Uiterwaal, S.F., Palmer, J.L., Farook, S., Deem, S.L., Taylor, C., and Blake, S. 2025. Reduced thermoregulatory ability contributes to increased mortality in urban box turtles (*Terrapene* spp.). *Journal of Thermal Biology*. 130: 104135. <https://doi.org/10.1016/j.jtherbio.2025.104135>.

Uiterwaal, S., Deem, S.L., Dell, T., Braude, S., O'Shea, M., Palmer, J.L., Parikh, S., Wise, A., Blake, S. Space use and environmental drivers of raccoon activity in an urban park: evidence of road avoidance. *Journal of Mammalogy* 106: 1372-1382. <https://doi.org/10.1093/jmammal/gyaf077>

Figure 2

Spring 2025 19



Taking visitors out to meet giant tortoises in the wild is a large part of our work in Galapagos

The purpose behind the party: Celebrating giant tortoises at ZOOFARI

By Sharon L. Deem, DVM, Ph.D., DACZM; Director, Saint Louis Zoo Institute for Conservation Medicine; and Director, Saint Louis Zoo WildCare Institute Center for Chelonian Conservation

Mendoza-Alcivar, G., Deem, S.L., Esperón, F., Nieto-Claudin, A. 2025. Viral Prevalence in Galapagos Gaint Tortoises. *Journal of Wildlife Diseases*. 61: 542-547.

Nieto-Claudin A., Zeas-Bermeo S., Guillen-Liger M.P., Deem S.L., Sacristan C., Mendoza-Alcivar G., Caroca-Caceres R. 2025. Fungi Matter: *Aphanoascella galapagosensis* associated with carapace lesions in free-living Galapagos tortoises. *Mycopathologia*. 190: 48 <https://doi.org/10.1007/s11046-025-00955-5>.

Notable Media

In 2025, we celebrated giant tortoises at the June Zoofari event (Fig. 2). Appreciating giant tortoises as the amazing animals they are was a theme at the event. These gentle giants are critical to the health of the animals that share their environments, and even the health of the ecosystems where they live.

Center Impacts:

In 2025, we focused on building global chelonian conservation capacity by educating the next generation of chelonian biologists and veterinarians. Throughout the year, we worked with many K-12, university, and graduate/veterinary students to develop the skills necessary to conserve chelonian species. Three highlights include training Malagasy veterinary students, Mitia and Nav, who joined us in St. Louis to work in the field and laboratory (Figs. 3a and 3b). Mitia and Nav have since graduated from veterinary school and work for the Turtle Survival Alliance in Madagascar. Additionally,

Figure 3a



Figure 3b



Figure 4



we trained two U.S.-based undergraduate students on turtle conservation right here in Missouri (Fig. 4). These two students have moved on to great things: Dani now works at WildCare Park, and Isabel is in her first year at the University of Missouri-Columbia College of Veterinary Medicine.

Additionally, ICM wildlife veterinarian Dr. Ainoa Nieto Claudin (Fig. 5), left her position with the Zoo after four years to become the first Global Program Veterinary Coordinator for the Turtle Survival Alliance. We are proud of Ainoa and that the WCI CCC was key to her preparations to be able to fulfill this important role for the conservation of chelonian species globally.

Figure 5



Stories from the field

Galapagos

By Emily Donovan, Ph.D. Candidate at Southern Illinois University-Carbondale

For over a decade, the Giant Tortoise Movement Ecology Programme has tracked adult Galapagos tortoises and monitored nest success. In 2022 I began my Ph.D. in ecology at the Southern Illinois University-Carbondale, in which I have been able to help integrate adult movement with nest success by identifying nests laid by GPS-tracked females from the Cerro Fatal population on eastern Santa Cruz Island. By combining movement data with field-based portable x-ray imaging, the team accurately detected nesting activity and nest locations, identifying 159 nests by the end of 2024, with

some females laying up to five nests in a single season. But knowing when, where, and how often females were nesting only reveals part of the story of reproductive success. The field team, led by researchers Freddy Cabrera and Crístian Peñafiel, returned to the nests at the end of incubation to record how many eggs had hatched, weigh and measure the hatchlings, and take genetic samples.

In February 2025, veterinarians Dr. Sharon L. Deem and Dr. Ainoa Nieto Claudín provided hands-on genetic sampling training in the field, demonstrating safe blood collection techniques from the delicate hatchlings. During each field trip, nests that were estimated to be fully incubated based on the date the eggs were laid and recent weather conditions were visited. The field crew then listened for signos de vida – signs of life – underground to confirm that it was ready to be opened. The faint but unmistakable sound of tiny claws

scraping through the soil indicates active excavation and movement toward the surface. Dr. Deem offered her stethoscope to amplify the sound.

Nests often hold a mixture of hatchlings and unfertilized or unsuccessfully incubated eggs. Only 42% of eggs laid by the tracked females hatched in 2025, an improvement from 31% the year prior. Once extracted from the earth, the vivacious hatchlings were placed in a box to await processing. A quick swab, a brief poke, and a pause on the digital scale and between the jaws of a caliper, and the hatchlings were on their way (Fig. 6). Immediately upon release, they began to scatter and seek shelter, but not before stopping for an opportunistic and uncoordinated bite of foliage they encountered along the way.

The genetic samples, which are being analyzed by partners at the University of British Columbia, will be used to understand how many males are contributing to recruitment of new tortoises to the population. Understanding gene flow and genetic diversity and how the movement of females might influence paternity could be vital for long-term conservation of this critically endangered population.

Figure 6



GTMEP team checking in on one of our the giants in our study.



Plans for the Future:

As we move into 2026, the WCI CCC commits to continuing to educate, conduct research, and ignite actions that ensure the conservation of chelonian species locally and globally. We plan to work in Galapagos and Madagascar while we continue our long-running (14 years!) St. Louis Box Turtle Project right here in Missouri. Each of our projects uses a One Health approach, considering the health of turtles, humans, and ecosystems on which all life depends. It is our promise that we will continue to do so as we advance A World United for Wildlife, to Ignite Lasting Change, and work for the long-term survival of these iconic and ecologically significant species.

Donors

George F. Farrel Wildlife Conservation Endowed Fund was established in 2021 and offers continued support for the WCI CCC.

Thank you to the numerous individuals who have supported our work through donations of time and/or funds that helped ensure our work to conserve turtles and tortoises in 2025.

Some of our box turtle friends here in Forest Park.



Partners

