



Reproductive Health Surveillance Program 2024 Report

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Red wolf (*Canis rufus*)
Photo A. Franklin

IMPROVED SUSTAINABILITY THROUGH PATHOLOGY

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Project Update

Last year the [Reproductive Health Surveillance Program \(RHSP\)](#) worked on advancing ongoing projects like the great ape comparative study, and we started a collaboration with Dr. Lemaitre, from the Université Claude Bernard, Lyon, France,

Male Reproductive Aging

The first phase of the male reproductive aging project was spearheaded by one of RHSP's summer students. Using bioimage analysis software, L. Coleman characterized age related changes in red wolf testes. She developed a rubric for evaluating testicular disease in canids. The software makes it time-efficient to measure the total area of seminiferous tubules and compare these



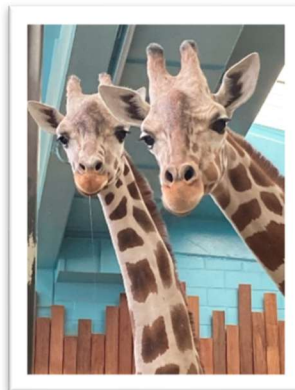
Histology of a normal seminiferous tubule in the testicle of a red wolf (*Canis rufus*). Photo: D Agnew

across ages. Different species age reproductively at different rates. Information about what the reproductive lifespan is for each species supports breeding programs, allowing them to consider that information along with age at sexual maturity to optimize breeding recommendations. This project further supports sustainable populations under managed care, a key goal of the RHSP.

We are thankful for continued financial support from [AZA](#), [RMC](#), [MSU](#), and grants from NIH and Boehringer Ingelheim for student support.

More Giraffe & Okapi please

The giraffid reproductive pathology study included 19 male and 68 female giraffe but only 3 male and 15 female okapi from the [RHSP](#) archive. Preliminary results were



Reticulated giraffe (*Giraffa camelopardalis*). Photo A Moresco

presented at the AAZV and AZA's Giraffe and Okapi Conference. The most common lesion in female giraffe was neutrophilic inflammation, while in okapi it was endometrial hyperplasia. In male giraffe the most common finding was testicular degeneration. Insufficient male okapis were available. The RHSP reached out to collaborators to strengthen the number of okapi cases and have added 45 cases. Senior vet student C. Kosiba is wrapping up data collection and the final paper will be here soon.

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- POLAR BEAR ULCERATIVE VULVAR DERMATITIS
- COMPARATIVE REPRODUCTION IN APES

Polar bear vulvar dermatitis

Polar bears continue to be a focus of the RHSP. The project has been tackled by students working in collaboration with Dr. [Chris Contag](#) to use whole genome sequencing to identify potential pathogens involved in ulcerative vulvar dermatitis. This condition is identified in a majority of female polar bears in captivity, and the etiology of it is not yet clear.



Polar bear (*Ursus maritimus*)
Photo; A. Moresco

Howler Monkeys in Costa Rica

During the general physical exams at International Animal Rescue in Nosara Costa Rica, we performed full reproductive exams and were able to collect data on sonomorphology of the reproductive tract in 38 monkeys. The trip was a great experience for [Colorado Mesa University -Tech](#) student L Schmit and whose poster was accepted for the American Society for Primatologists conference. This study strengthened the



Mantled howler monkey (*Alouatta palliata*)
Photo; A. Moresco

relationship with North Carolina State University and international colleagues.

Training the Next Generation

The 2024 lineup again included some students who extended their project for another year new trainees: C Kosiba continued her work on giraffids, A. Grether looked into polar bear vulvar dermatitis, L Coleman kicked off the male reproductive aging project, L Schmit worked on howler monkey clinical reproduction and B Keating started work on epididymal lesions in carnivores.



Top (L to R): C. Yob (Lab manager), A. Grether, L. Coleman. Bottom (L to R) L. Schmit and B. Keating.

Select 2024 publications (trainees are underlined)

Grether A, et al 2024. Identification of a herpesvirus as a causative agent of ulcerative vulvar dermatitis in captive polar bears (*Ursus maritimus*) using next generation sequencing. In: Proc. Am Coll Vet Pathol..

Kosiba C et al. 2024. Retrospective study of reproductive tract lesions in giraffe (*Giraffa camelopardalis*) and okapi (*Okapia johnstoni*). In: Proc. Am. Assoc. Zoo Vet.

Levine BA, et al. 2024. Female long-term sperm storage results in viable offspring in the Himalayan Mountain Pitviper, *Ovophis monticola*. Zoo Biol. 43(2): 183-118. <https://doi.org/10.1002/zoo.21820>.

Moresco A, et al. 2024. Semen collection in rhinoceros via urethral catheterization. Theriogenology Wild. 4(100090). <https://doi.org/10.1016/j.therwi.2024.100090>.
Schmit L, et al. 2024. Uterine, ovarian, and testicular volume in mantled howler monkeys (*Alouatta palliata*) across age classes. In: Proc. American Society for Primatologists.

Full list of RHSP publications can be found [here](#).

Recognitions

At the MSU Annual Phi Zeta Research Day, A Grether won the award for best DVM presentation and L Coleman for best DVM poster. The RHSP publication *Reproductive One Health in primates* received a "most cited" award from AJP.

<https://doi.org/10.1002/ajp.23325>

Collaborations with AZA's Species Survival Plans

Are you part of an SSP? Does your species have sustainability issues and there is not enough baseline data for them? Contact us. We worked with the Small Carnivore TAG and the Binturong to gather data on morbidity and mortality issues (see publication list).

Comparative research

Do you have a reproductive comparative question, but you don't have the tissues across all the species you would like? Contact us, we are always looking for ways we can maximize our "library"!

RHSP STATS IN A FLASH

- **33 YEARS OF DATA**
- **> 3,550 ARCHIVED REPRO TRACTS**
- **> 350 SPECIES**
- **190 ZOO & AQUARIUM PARTNERS**
- **16 UNIVERSITY COLLABORATORS**
- **> 136 PUBLICATIONS**
- **INCLUDING 50 STUDENT PUBLICATIONS**
- **IDEAL FOR COMPARATIVE RESEARCH**
- **ARCHIVE IS AVAILABLE TO COLLEAGUES FOR COLLABORATIVE PROJECTS**