February + March 2025

NTS NEWSLETTER

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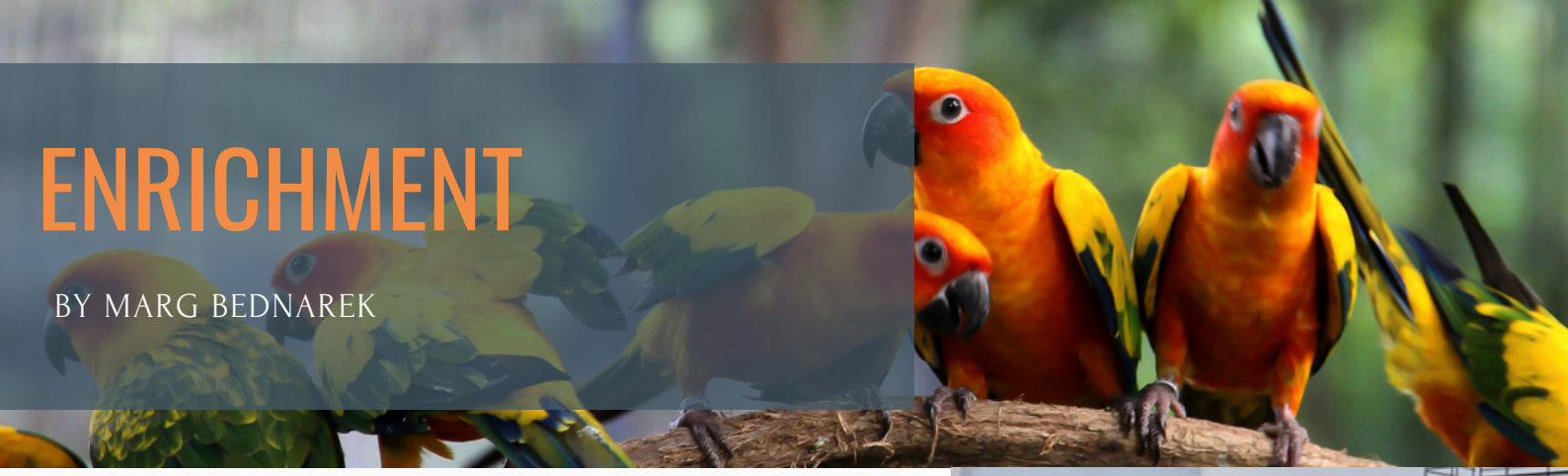
WHAT'S INSIDE?

ENRICHMENT

BY MARG BEDNAREK



Whether living at a zoo, in someone's house, or temporarily staying at a wildlife rehabilitation center, enrichment is a very important part of a captive animal's wellbeing. Enrichment is something given to an animal or placed in their enclosure that gives a creative outlet for physical activity and mental stimulation. This "something" can be a physical object, novel sound, visual stimulus, etc. Another important aspect of enrichment is that it gives the animal a choice to interact and therefore control over how they spend their time. Enrichment keeps an animal's day interesting and birds are no exception: enrichment needs to be offered to our avian friends as well.

Enrichment can vary from puzzle feeders, climbing structures, or a new hanging decoration. While variable, enrichment is typically divided into separate categories. Typically, zoo facilities have 5 categories of enrichment that can differ slightly to fit the specific needs of a species. For example, the Smithsonian National Zoo lists their enrichment categories as habitat, cognitive, sensory, food, and toys, while Colchester Zoo lists their enrichment categories as food, sensory, cognitive, social, and physical habitat.

Training is also a great source of enrichment for animals. Usually during training, animals are interacting with keepers for a special food item as reinforcement. Training sessions create choice whether or not to participate and encourage mental stimulation.

A common enrichment for a bird is foraging. Foraging is a natural behavior performed by wild animals where they search for food items. Foraging can be digging, scratching, chewing, or any other action that causes an animal to work for their food. In the wild, a bird can spend 40-75% of their day foraging for food. Companion birds spend far less time, usually less than an hour. This leaves a lot of extra free time to fill. A bored bird with too little enrichment might engage in negative or stereotypical behaviors, like pacing or feather picking. Creating and offering unique foraging opportunities is a great way to avoid these unfavorable behaviors.

Foot toys are also a common enrichment item. These are objects offered that aren't connected to the cage or enclosure and can be manipulated and held by the bird. Foot toys are mentally stimulating and can also help a bird improve dexterity and balance.

Enrichment items can be store bought or homemade; get creative! Just make sure stimuli being offered are safe and do not cause stress.

Photos courtesy of VIN Veterinary Partner & RSPCA Queensland

SOURCES

AAV - Foraging for Parrots | AAV - Enrichment Tips | AZA - Behavior, Enrichment, Training | Smithsonian's National Zoo - Animal Enrichment | Colchester Zoo - Environmental Enrichment

FOR THE LOVE OF ANIMALS

BY MADISON KASBAUM

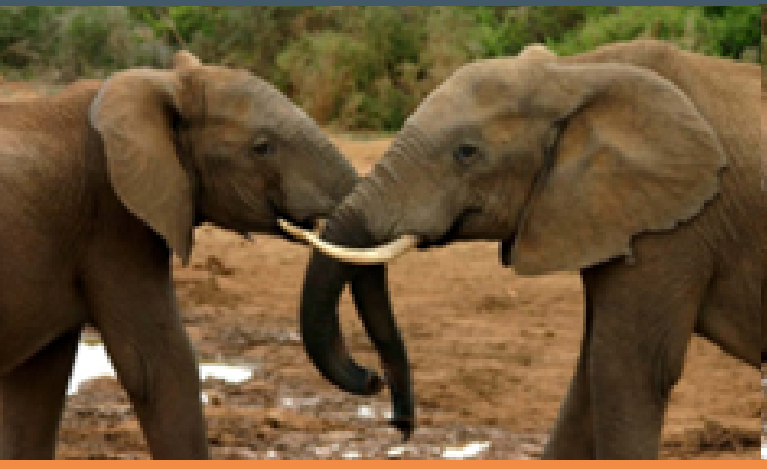
Dance Rituals

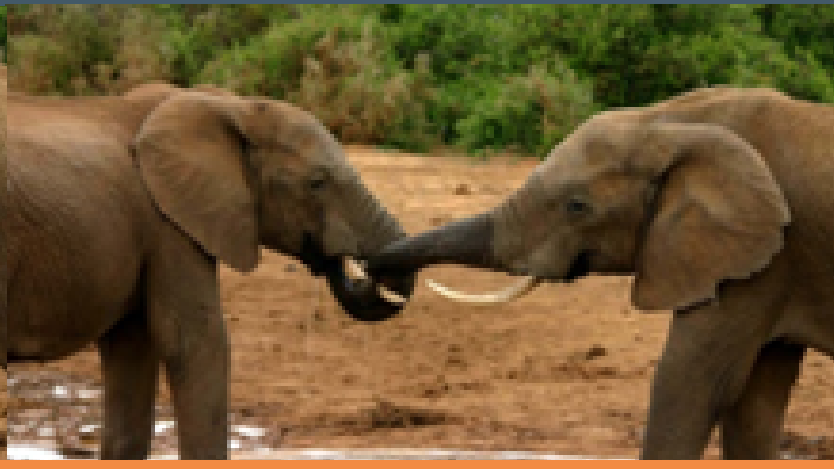
Albatrosses typically stay with the same breeding partner for life, returning each year to Taiaroa Head to reunite or find a mate. Young albatrosses return after at least four years at sea, socializing in groups called gams to practice courtship displays. These displays start as slow dances and evolve into a unique language between pairs, helping them recognize each other each season. Courtship displays include sky-pointing, lowering their head, then pointing upwards, and skycalling, extending their wings, followed by sky-pointing and vocalizing. They also participate in preening and beak snapping or rattling to show affection.

Birds-of-paradise (family Paradisaeidae) are known for their striking beauty, but these birds also vocalize and dance to attract their mate. Male birds of paradise use vocal and non-vocal sounds to attract females. Birds-of-paradise dances are learned behaviors, with young males inheriting moves from their fathers and improving them through practice and observation. Female birds carefully watch and choose mates based on these performances, shaping which dances are passed to future generations. However, because of the many variations in color, vocalization, and movements, it is believed that there is still much more to learn about this family of songbirds.

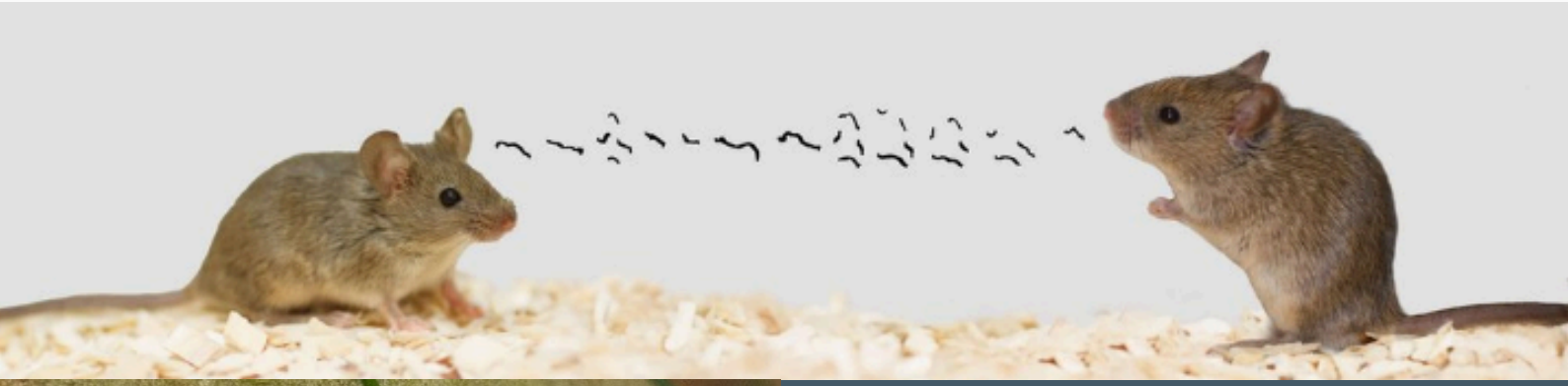
Song Rituals

All African elephants have similar social structures. Adult males, called bulls, are solitary or live in bachelor herds, while females and their offspring form matriarchal herds. When bulls are ready to mate, they enter a period called musth, marked by aggression, ear waving, and spreading their scent to attract females. Females emit a call that other elephants can hear from 2.5 miles away, though it is inaudible to humans. When a pair meets after responding to the female's song, they engage in courtship behaviors such as trunk intertwining.





Love is always in the air for mice, with females capable of breeding at six weeks old and males shortly after. They have a short gestation period of 19 to 21 days, and offspring become independent within weeks. This rapid cycle allows mice to produce multiple litters per year, quickly leading to large populations. However, many do not know of the mating rituals that take place before they reproduce. Male mice produce high-pitched courtship songs, or ultrasonic vocalizations (USVs), that play an important role in mouse courtship and social interactions. Male mice are commonly known to produce USVs during mating, and females prefer vocalizing males. Within the last 10 years, it was discovered that females also sing during chases and as a response to the male's song.



Other Peculiar Rituals

Though most snails are hermaphrodites, their mating ritual can give Cupid a run for their money. Some snail species engage in a complex mating ritual involving hours of circling, tentacle holding, love bites, and launching a "love dart." This love dart filled with snail hormones alters the recipient's reproductive state to improve their chances of becoming a proud parent of a baby snail. Previously, researchers thought these passionate projectiles were "gifts," but more dart mechanics were discovered as the superfamily Helicoidea was observed. The dart made of calcium carbonate forms in the dart sac and can grow up to a fifth of the snail's body. If the dart fails or misses, the mating ritual immediately stops, and the two hopeless lovers continue searching for a better match.

Porcupines, usually solitary, seek mates in treetops or on the forest floor, often making shriek-like vocalizations and teeth chatter. Males intently track their chosen female over 250 acres to find her during mating season. They then compete with other males over females for hours, fighting with teeth and over 30,000 available quills, sometimes causing serious injury. When it is time to mate, the male approaches the female, spraying her with urine and triggering her love-filled cry back to the male.

SOURCES

Defenders of Wildlife - For the Love of Animals | Natural History Museum - Snail Love | eLife - Female Mice Ultrasonically Interact | Northern Woodlands - Porcupine Courtship | Carnegie Museum of Natural History - Snail Reproduction | Department of Conservation - Royal Albatross Behavior | Discover Magazine - Courtship of birds-of-paradise

LET'S HOP TO IT - ADVENTURES IN AMPHIBIAN VETERINARY CARE

BY DANA WILLIAMS

In December of the fall semester, we had the privilege of hosting Dr. Jenny Herbert, a U of I CVM grad and now practice owner in northwestern Indiana. She is a certified aquatic veterinarian and has plenty of experience treating animals from all taxa-amphibians included. In her talk with us, we went over some special considerations to keep in mind when seeing amphibs, an overview on husbandry, handling, diagnostics, surgical considerations, and common diseases that will present in clinical practice.

To start our lecture, she went over characteristics unique to amphibians. The biggest takeaway is that their skin is a critical organ that absorbs oxygen and any other substances via their skin. Their skin must be moist to do this, but because their skin is so adept at absorption, they are also uniquely sensitive to environmental exposure by that route. They also thermoregulate just like reptiles, but they can also regulate water homeostasis by soaking in water. Due to the special nature of their skin, powder-free disposable gloves must be worn when directly handling. You can moisten the gloves to make the patient more comfortable.

Building on our new understanding of just how absorptive the skin is, we next discuss husbandry for these delicate animals. There are important considerations for establishing proper husbandry for the individual in question, such as: Are they aquatic, terrestrial, or both? Do they require different environments depending on the stage of life? What are the temperature and humidity parameters they need? What is the diet for this species? This is not an exhaustive list of questions, but it is a good starting point.

Dr. Herbert shares that most of the clients that she sees that own amphibians have vivarium setups for their pets. She refers to the variety of needs for each species when she tells us that there is not one perfect setup for all species and that the internet is full of misinformation. Special considerations for vivariums include the husbandry requirements for that species (temp, humidity, etc.), as well as appropriate substrate (foreign body surgery, anyone?), water parameters, and ease of cleaning/removal of detritus.

As an aside, she explains how the nitrogen cycle affects the health of the amphibian. To briefly summarize, waste products that are not removed decompose and releases ammonia (toxic), which is then fixed by bacteria into nitrite (toxic), fixed again into nitrate (less toxic, but nevertheless), and finally this final product is removed either by plants, released as a gas, or accumulates in the water.

It is impossible to know the specifics for all the possible species we may see, so having good resources to rely on is invaluable to the non-traditional species practitioner. One tip Dr. Herbert gave us was to have a history form for clients to fill out prior to the appointment. This gives you valuable time to do some quick research for the upcoming appointment and can help narrow down your differentials and guide your consultations.

One of the most common presentations is dehydration. Their skin is a mucous membrane- tacky is dehydrated, moist is euhyrdrated. Dehydrated amphibs will stop urinating to conserve body water but will accumulate nitrogenous wastes that can cause further issues upon rehydration. Other common diseases include skin lesions, hypovitaminosis A, Nutritional Secondary Hyperparathyroidism, obesity, foreign bodies, gastric overload, and infectious diseases.

This was a summary of this lecture with all of the highlights and important details included. There was much more covered in this lecture, like diagnostics, surgical considerations, and case discussions. Be sure to make it to the next ARAV lecture!

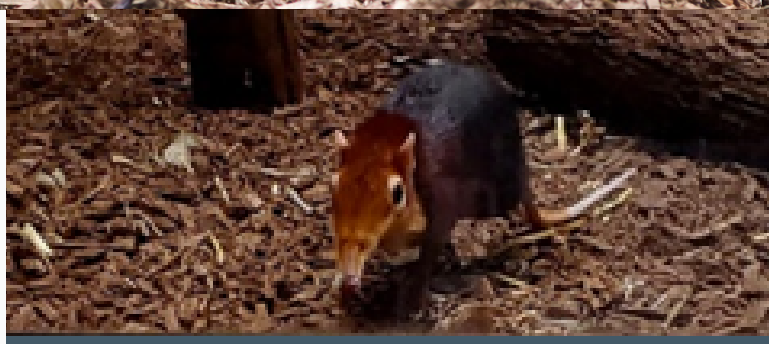
SMALL BUT MIGHTY: THE GIANT SENGI

BY KAYLA BASKIEWICZ

Overview

Rhynchocyon petersi, commonly called the giant elephant shrew, giant sengi, or black and rufous sengi, is a diminutive, diurnal mammal native to the coastal forests of Tanzania and southern Kenya. The giant sengi has a striking appearance, despite only reaching around 11 inches in body length and weighing around 1.5 pounds. Their small size, large eyes, rat-like tail, and bold colors make them curious looking creatures, with the giant sengi's most notable feature being an elongated proboscis snout. This proboscis allows them to sift through leaf litter efficiently, and a long tongue quickly scoops up bugs that comprise their insectivore diet. They have short yet powerful legs, making them among the fastest small mammals.

Giant sengis have subverted scientists' expectations since their discovery. Originally classified in the order Insectivora and called the elephant shrew due to their trunk-like snout, recent phylogenetic evidence revealed that these unique creatures were not closely related to any other living mammal. Now falling under the super-cohort Afrotheria, their monophyletic grouping is evident when considering the multitude of traits that set sengis apart from other species. Endemic only to Africa, they are some of the few small mammals that are entirely monogamous, and undergo a menstrual cycle similar to humans and other primates. Giant sengis nest directly on the forest floor, while their relatives dig burrows similar to true shrews. They also have unusually large brains comparative to their size, an isolated trait found in sengis alone.



Challenges in Captivity

One of the greatest challenges with captive rearing and breeding of giant sengis is the general lack of information regarding these animals. Rarely observed in the wild, giant sengis were considered quite difficult to maintain in captivity for some time. Interestingly, proper nutrition was a major challenge for sengis in zoos. When the Philadelphia Zoo acquired its first sengis in 1999, little was known about the care and feeding of this species in captivity. Over the course of a few years, a decline in health of both adults and offspring was documented. Evaluation of the animals revealed poor skin and coat (including the incidence of ulcerative dermatitis), periarticular inflammation, unusual lesions and hemorrhaging, and abnormal cartilage development, all of which indicated that the animals were suffering from chronic vitamin C deficiency. Vitamin C deficiency is not a common issue within zoo animals, as most mammal species have the availability to synthesize vitamin C from ascorbic acid. However, it was hypothesized that R. petersi, like humans, primates, and guinea pigs, may lack the enzyme necessary to convert dietary ascorbic acid into its bioavailable vitamin form. Vitamin C was thus supplemented in the animals drinking water, which resulted in a notable decrease in both acute and chronic diseases associated with hypovitaminosis C in the Philadelphia Zoo's sengis.

The giant sengi represents an incredibly unique and fascinating species that has been mostly overlooked in zoos until recently. While only a handful of zoos now house these curious creatures, hopefully, with increasing awareness and knowledge about them, more accredited zoos will be able to showcase the interesting yet elusive giant sengi.

SOURCES

Belgian Journal of Zoology - Density and Cover Preferences | California Academy of Sciences Dept. of Ornithology and Mammalogy - Sengis Biological Synopsis | Molecular Phylogenetics and Evolution - Phylogenetic Relationships | AZA Nutrition Advisory Group - Vitamin C for Giant Elephant Shrews

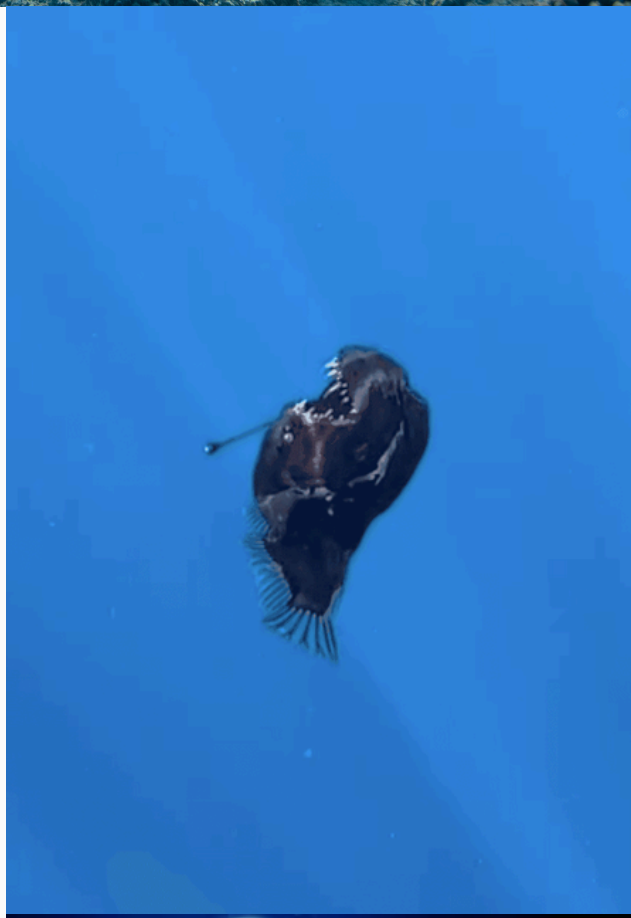
AN ANGLERFISH'S AMAZING ASCENT

BY OLIVIA BONCOSKY

In early February, an unexpected visitor emerged from the depths of the ocean off the coast of the Canary Islands and shocked marine biologists. This alien-like fish is known as the Humpback Anglerfish, or Melanocetus johnsonii, and usually lives at depths up to 15,000 feet. Scientists are unsure what drove this fish to ascend to the surface, but it is speculated that it could have been a result of predation, strong updrafts, or illness. Regardless, this marks a special event for researchers, as this may be the first time the Anglerfish has been recorded in shallow waters. Unfortunately, the fish did not survive long after its journey, but researchers will now have the opportunity to further study this elusive species.

The Humpback Anglerfish was first discovered in 1863 by James Yate Johnson. The fish has a very unique appearance, with a rotund body and a disproportionately large head. They also have very large, sharp teeth that aid in consuming large prey. The most distinct feature of the Anglerfish is its illicium. This structure resembles a fishing pole, and sprouts from the dorsal aspect of the fish's head. It is derived from the spines of the anterior dorsal fin, and it has a bulb-like end that is bioluminescent due to a symbiotic relationship with the bacteria Enterovibrioescacola. The illicium allows the fish to attract prey by producing light in the darkest areas of the ocean - a skill essential to the survival of this species.

This unique ocean creature remains somewhat of a mystery to researchers, but with its recent adventure to the surface, we have the opportunity to learn more about life in some of the deepest areas of the ocean.



SOURCES

CBS News - Black Seadevil Fish | Indian Science Cruiser - The Fish with a Light

LOVE IS IN THE AIR

BY KATHERINE RAPER

Although Valentine's Day has drifted away, there are several species that have committed to having the same partner for many Valentine's Days to come. So, in the spirit of love, I thought I'd list some fun facts about nature's power couples who have committed to each other forever!

1. Gibbons: whenever you think of the love of your life, is there a song that jumps into your head? There is for the Gibbon! Paired gibbons often perform "duets," combining their individual mating calls into one once the relationship has formed. This song is then carried throughout their lives and is often used as a GPS system guiding the males back home when they may stray too far from their territory.
2. Black Vultures: do you often feel as though everyone has an opinion on how your relationship should go? Try complaining to a Black Vulture. These feathered friends not only mate for life but help to hold each other accountable. Should a vulture be caught being a little too friendly with someone else, the rest of the flock will start an attack and send the sneaky scoundrel flying back home to their true partner.
3. Eurasian Beavers: from what I've heard, your partner should be someone that builds you up, and no one does that better than the Eurasian Beaver! These couples will often split up duties, and help each other to maintain dams, guard their territory, and parent their young. They split the workload to maximize their joint survival and never forget to pick up dinner on the way home!

Valentine's Day isn't just about romantic love, it's also about recognizing the love and support of family. And (according to Harry Potter), there is nothing stronger than a mother's love, so let's look at some of nature's best mothers as well!

1. Orangutans: I don't know about you guys, but anytime I have a problem I can't solve the first person I call is my mom. Just like the orangutan, I'm pretty reliant on my mother's advice. Orangutans are completely dependent on their mothers for food and transportation for the first two years of their life and will stay by their mother's side for up to six- or seven-years total. But that's not all! Many female orangutans are known to "visit" their mothers for up to 15 or 16 years after leaving the nest!
2. Elephants: ever heard the phrase "it takes a village?" Well, how about a herd! No new mother is alone in an elephant herd, as many of the more experienced mothers will help a young calf find its footing or learn how to nurse. Many of the older elephants will also slow the pace of the herd to allow the new mother and calf to remain in stride with the rest of the group!

While love can be a complicated thing, it can be found everywhere, even in nature's circle of life. So should you be looking for a new way to show some love or woo your own partner, maybe some of our animal counter parts could give you a few ideas! Happy belated Valentine's Day everyone!

SOURCES

BBC Earth - 7 Animals Who Mate for Life | WWF - 5 Remarkable Animal Moms

WU IN REVIEW: WILDLIFE UNIVERSITY 2025

BY TONI KIM

In early March, the NTS executive board hosted the Wildlife University 2025 symposium. If you have not yet heard of WU, it is an annual student-organized conference dedicated to inspiring and educating those interested in zoological & wildlife medicine, research, and conservation. Though the symposium has been a staple for the NTS executive board for many years, it has been challenging to host the event to an in-person format since the pandemic. Thus, WU 2025 has been the first iteration held in-person.

For those who were not able to attend, we are happy to report the event was a great success. Topics included ethics within zoo and wildlife medicine, zoo anesthetic emergencies, conservation work with aquatic species in Punta San Juan, wildlife ophthalmology, a snapshot of 40 years of research in cheetah medicine, the evolution of the Wildlife Epidemiology Lab, conservation strategies with Attwater's Prairie Chickens, wildlife legislation for veterinarians, and HPAI control at the Denver Zoo. Wildlife Trivia at Wild Night Out was filled with laughs during both the simpler questions and during the ones that stooped most of the crowd. The turtle necropsy & esophagostomy tube placement wet lab was completed without a hitch and received great feedback from those that participated.

All in all, our goal is to make Wildlife University bigger and better every year and continue the legacy of this event for veterinary students to come. In order to do this, we need your help! Please complete the Wildlife University feedback form shared via our email. We are also looking to hear from those who chose not to attend, so we can better meet the interests of our members next year.