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NOVEMBER/DECEMBER 2025

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WELCOME TO FALL

As I write this, Fall has come to Southern California. Today, while surfing at Bolsa Chica State Beach, a familiar head popped up a few yards in front of me. A young green sea turtle! (*Chelonia mydas*). The green sea turtle has been removed from the International Union for Conservation of Nature and Natural Resources (IUCN) Endangered species status list and is now listed as a species of Least Concern, thanks to decades of

conservation efforts. I usually see green sea turtles while surfing in Hawaii, though I have seen them at Doheny State Beach and at Seal Beach in California. Now, I've seen one swimming at Bolsa Chica State Beach. There is a resident population of green sea turtles that have been living in the nearby San Gabriel River, (a largely now urban river that runs under the 405 freeway at one point and parallel to the 605 freeway at another) for years. Some say they are attracted to the warm water from the nearby power plant, but it is still peculiar to see these majestic reptiles swimming amongst discarded mattresses and shopping carts and other trash that accumulates upstream and finds its way downstream. According to the IUCN, the population of the green sea turtle has increased by 28 percent since the 1970s when the reptile was placed on the IUCN Red List.

Studies over the years have pointed to a rebound in the turtle's populations. Populations of green sea turtles in and around Hawaii and American Pacific island territories have increased, sometimes by an average of 8 percent each year since scuba diving researchers began counting them in 2002, according to a 2019 study published in the PLOS One journal. The researchers went around 53 islands, atolls, and coral reefs in the U.S. Pacific from 2002 to 2015 and counted more than 3,400 sea turtles, 90.1 percent of which were green sea turtles. Sea turtle counts around Hawaii experienced an 8 percent increase, while the number of sea turtles around American Samoa and the Mariana Islands increased by an average of 4 percent a year.

Soon the wild reptiles and amphibians in my area will go on hiatus, but not just yet. Yesterday I was out riding my bicycle near the Bolsa Chica Ecological Reserve, a natural reserve on public land that is governed by the state of California. I wasn't in the Bolsa Chica (bicycle riding is restricted in the majority of the reserve) but rather I was on the bluff above in what is called Harriet Wieder Regional Park. As I was riding, something caught my eye on the single track in front of me and I stopped to watch a pair of lizards scamper down into one of the many holes that are found on the trail. Too fast to identify, I could only imagine what species they were. This occurred in the late afternoon when the winds blow off the ocean, cooling the mesa considerably. During the summer, this trail gets very hot and it is the ideal time to see what reptiles are out thermoregulating. Mostly you'll see Great Basin fence lizards or Western side blotched lizards, but you can also see the occasional San Diego alligator lizard. The area does have Southern Pacific rattlesnakes, San Diego gopher snakes and California kingsnakes, but they aren't as easily seen as the lizards. In fact, I've only seen a California kingsnake and gopher snake one time each during

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the last 25 years walking the wetlands, and Southern Pacific rattlesnakes twice. Welcome to Fall.

Alex Myers, who co-authored the September/October 2021 cover story "Return of the Dragons: Understanding the new Hydrosaurus species!" reports from Indonesia his observation of sailfin dragons and other species on his first of what will be many herping adventures to the island nation in Southwest Asia and Oceania. Myers saw quite a lot of reptiles during his trip which was certainly a blast for this young reptile enthusiast. Foster Reves took some time to talk story with Tom Crutchfield, one of the legends of the reptile ikeeping community. Crutchfield has seen and done it all over the last 50 or so years and speaks about the early days of the hobby. Zac Ala discusses his breeding project with Axanthic water monitors, breeding the first Axanthic to Axanthic water monitors with a cross country pair of monitors. Rachel Presser writes a company spotlight on Japanese reptile and fish food provider Hikari, which provides a variety of foods for lizards, turtles and amphibians, and of course fish, which it got its start with koi. Bryan Kao visited the

Phoenix Herpetological Society in Arizona and reports on the array of reptiles that are at the PHS. The PHS is a wildlife rescue and a non-profit that rescues and rehabilitate native and non-native reptiles. And finally we have a holiday gift guide to make things easier when looking for gifts for your favorite

reptiles or your favorite reptile keepers. Hope you enjoy this issue and don't forget to wash your hands and the hands of your children before and after you handle your herps.

John Vivaldo



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► Magazine Reader Enjoys

These magazines are amazing!!! I have a 2-year old rosy boa and I read these magazines all the time. They provide me with so many cool facts about reptiles that I didn't know, and even several care tips about how to domesticate these scaly critters!

Gavin Franz via ReptilesMagazine.com

Hi Gavin,

Thank you for reading and thank you for your support! If you have any recommendations on how we can improve your reading experience, please let us know!

Ed

► Aussie Water Dragon Training

Hi, my name is Ryan and I have a young Australian water dragon. I think it's two years old. I got him from a breeder in Florida, but I no longer have contact with that store that I got him from to ask questions. I was wondering if I can send you some pictures and you can tell me how old you think he is. He eats out of my hand, is very very nice and friendly and let's me hold him but he's still very flighty and he'll jump. I know that they're like that by nature, but I have also heard they



can really tame down to really being handled a lot and he lets me handle him. He just gets really spooked and I was just wondering when if he gets older, will he calm down a lot and does he still have a lot of growing to do. Do I still have time to work with him to train him?

Ryan Hughes

Via ReptilesMagazine.com

Hi Ryan,

It is nearly impossible to tell the age of a young dragon such as yours. My advice to you is to keep working with him as you are, until he gets more comfortable and also keep in mind that he can jump off you at any time as they can be flighty. Based on the photos that you sent, it seems that you have a pretty good handle on him getting used to you. Continue with what you are doing as he is responsive to it. Feeding him by hand like you are doing is great to earn kudos from him as he will associate you more as the giver of food. Which is a plus.

Ed

► Ball Python Breeding

Hello,

Do you have any information on breeding ball pythons for the first time? If so that would be very helpful to me.

Edward Bosch via ReptilesMagazine.com

Hi Edward,

Check out our ball python care and breeding article on the Reptiles Magazine website here <http://bit.ly/491rQ9a>

► Bacon's Water Skink

Hi,

My name is Anne Pannent and I am a beginner reptile breeder in the state of Ohio. I have successfully bred water skinks (*Tropidophorus baconi*) Hopeful to continue the project. Hope this can help to begin captive breeding projects and stop a lot of the imports.

Anne Pannent via ReptilesMagazine.com

Hi Anne, it's great to know that you are successful in breeding these skinks. There aren't a lot of folks breeding these reptiles and if you want to write a how to on breeding them, please let us know.

Ed



► Five-Lined Skink Care

My name is Silas Wilkins. I am a home schooled high school student and I've been keeping several five-lined skinks (*Plestiodon fasciatus*) for about six months now. I have a ton of questions on how to keep and potentially breed them. Could you help me or refer me to someone who has the knowledge and time to give me some tips on how to responsibly raise this amazing lizard?

Thank you,
Silas Wilkins
via ReptilesMagazine.com

Hi Silas,
Good questions. The five-lined skink is not a very popular lizard kept as a pet, as most are field collected rather than captive bred. I am not aware of any breeders who could help you with questions regarding breeding this beautiful species. ReptilesMagazine.com doesn't have any breeding information on this species nor does it have any care information either. This is surprising since it is a species native to the United States. The lack of popularity with this species could be due to restrictions on keeping it in certain localities. I did find some information on caring for the species. You mention you have several five-lined skinks. If you are keeping two skinks, a 40 gallon equivalent enclosure is ideal. More than two, and you should have a minimum 80 gallon enclosure. Outfit the enclosure with plenty of hides and cork tubes. The substrate should be conducive to burrowing. Humidity levels should range between 20 and 60 percent. A spray bottle or misting system can be used to ensure humidity is at their preferred range. Keep a water dish with fresh water daily so they can soak if necessary and drink from if they aren't lapping up droplets during the misting. One side of the enclosure should have a 60 to 75 W basking light and UVB light, with the warm spot at around 85 degrees Fahrenheit. The five-lined skink is a Zone 3 reptile on the Ferguson Zone. They are a partial shade and open basking reptile. Mount a T5 HO 5.0 (6% UVB tube inside the enclosure, about 10-14 inches above the basking area and use a Solarmeter to ensure the efficacy of the UVB bulb.



The cool side of the enclosure should be around 75 to 80 degrees Fahrenheit. Nighttime temperatures should not drop below 65 degrees. Feed them dubia roaches and crickets dusted with calcium without D3. Hope this helps. Hopefully a breeder can chime in as well.

Ed

► Three-toed Box Turtle Rescue

I have four three-toed box turtles. I have had two of them for three years and two of them for four years. They came to me as rescue turtles as there was something wrong with each one of them. They are now healthy. I'm not able to care for them

any longer due to circumstances. Please advise what should I do.

Amy Lynn

Hi Amy,
Thanks you for caring for them as long as you did. Please find a reptile rescue near you that will take them in. They can help rehome them.

Ed

► Corn Snake or Ball Python

Python

My son wants a snake. He is 10 years old and has been keeping tropical fish for about three years. He wants either a corn snake or a ball python. What would you recommend?

Jay Gatdula

Hi Jay,
The corn snake is a great first snake due to its calm demeanor and easier care requirements, plus they come in beautiful colors. Check the care sheet at <http://bit.ly/4oCWgTX>.

Ed

HERPERS' MOST **wanted**

BY JOHN VIRATA

West African Mud Turtle (*Pelusios castaneus*)



PHOTO BY MEGAN CZARNOCKI/SHUTTERSTOCK

Description: The West African mud turtle, also known as the African side-necked turtle or swamp terrapin, is a small aquatic turtle that is known for its elongated neck that it uses to capture fish in its native habitat. The turtle is not as popular as other semi-aquatic turtles largely due to its coloration, which is a plain brown, to mimic the mud in which it seems to spend a lot of its time.

Size: They West African mud turtle can grow to about 10 inches in carapace length and can live up to 50 years or more in captivity with proper care.

Native Range: The West African mud turtle is native to much of West and Central Africa, including Angola, Guinea, Ghana, Senegal, Liberia, Sierra Leone, and the Republic of the Congo.

Natural Habitat: The West African mud turtle lives in rivers and mud holes and other bodies of water where prey items such as fish are plentiful.

Enclosure: The ideal tank for this small turtle should be about 100 gallons in capacity with 125 gallons or more ideal. The tank should have a water depth of 8-12 inches for adults and 4 to 6 inches



PHOTO BY DEBBZ87/SHUTTERSTOCK

for juveniles. This ensures that the turtle has ample room to swim about because that is what they do most of the time. Ensure that the fine river sand substrate is sloped to provide a haul out area for your turtle to bask and dry out when it needs to get out of the water. The water should be cleaned with a canister filter that can filter 250 to 300 gallons per hour for a 100-125 gallon tank. Canister filters sit outside the tank for easy maintenance. And make sure that you keep a maintenance schedule because aquatic turtles such as the West African mud turtle can be and are messy eaters. Maintain a water temperature of 75 to 82 degrees Fahrenheit (24 to 28 degrees Celsius) with a pH level of 6.8 to 7.8. Perform weekly water changes of between 25 and 50 percent of the water. The basking platform can be either in the water or on the sand. Ensure the platform has a light above it that can reach 90 to 95 degrees Fahrenheit (32 to 35 degrees Celsius). Ambient temperature in the rest of the tank should be 78 to 85 degrees Fahrenheit (25 to 29 degrees Celsius). UVB lighting should be provided with 10.0 T5 UVB tube over the length of the enclosure. Change out to tube according to the manufacturer's recommendation. Run the UVB light for 10-12 hours a day.

Diet: Juveniles should be fed a daily diet of earthworms, crickets, roaches, shrimp, krill, snails and chopped fish. You

can also try and feed them occasional vegetables such as dandelion greens, romaine and duckweed as juveniles. As adults they are primarily carnivorous. Feed them high quality turtle pellets as well to ensure complete nutrition. Adults should be fed every other day. Dust their foods with a Calcium powder and a multi-vitamin.

Reptile Keeper Level: Intermediate to

advanced. The West African mud turtle requires specialized care and frequent water changes to ensure it remains healthy.

Extra: The West African mud turtle reaches sexual maturity in four to six years. They have a side neck that enables them to reach sideways around their shell. They will learn to recognize their keeper and beg for food. **REPTILES**

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Email questions to reptileseditor@gmail.com. All letters are subject to editing by REPTILES staff. We welcome comments and suggestions. Please note that not all letters can be answered personally or will appear in this column.

Herp Queries Book reviews: **Slither**

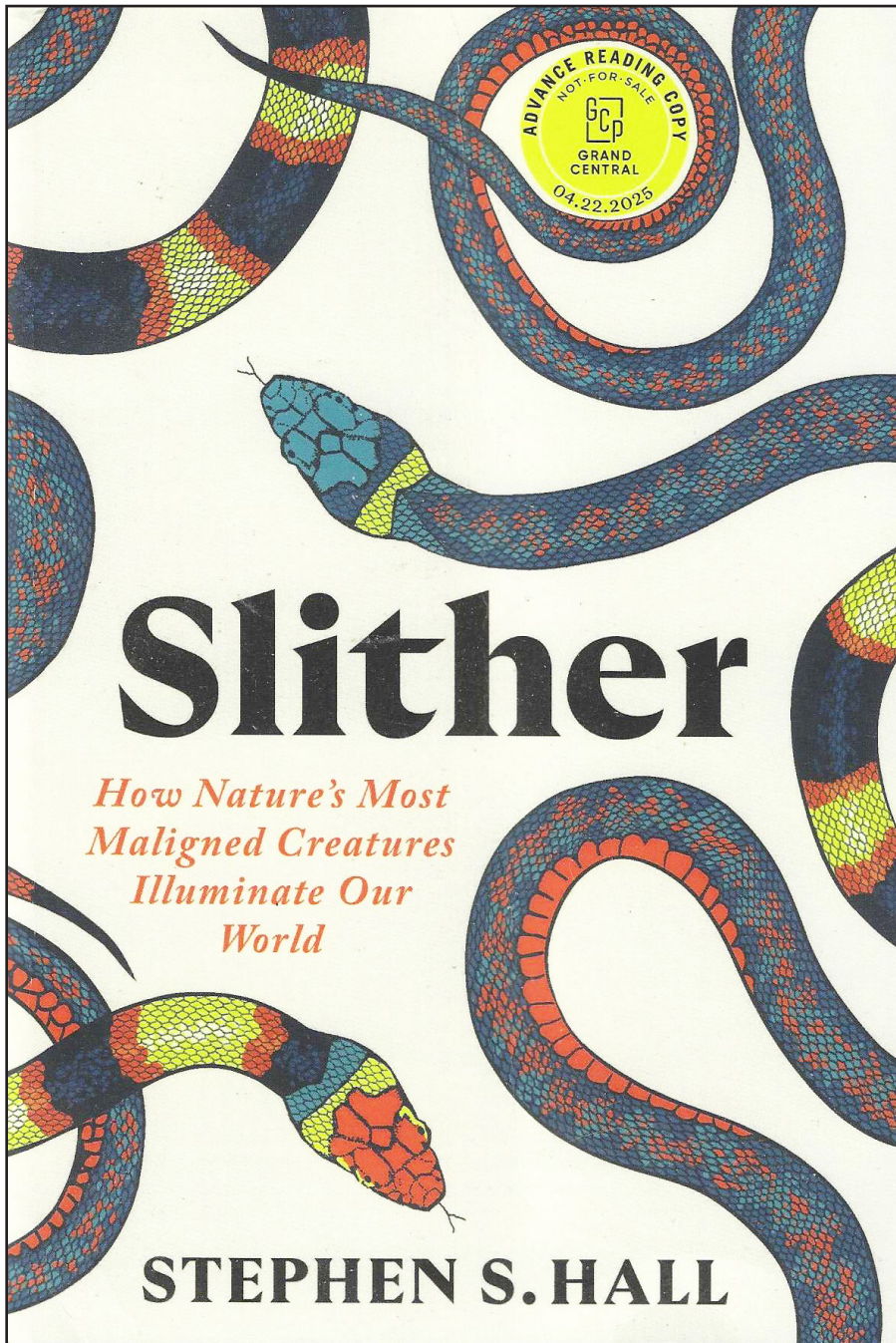
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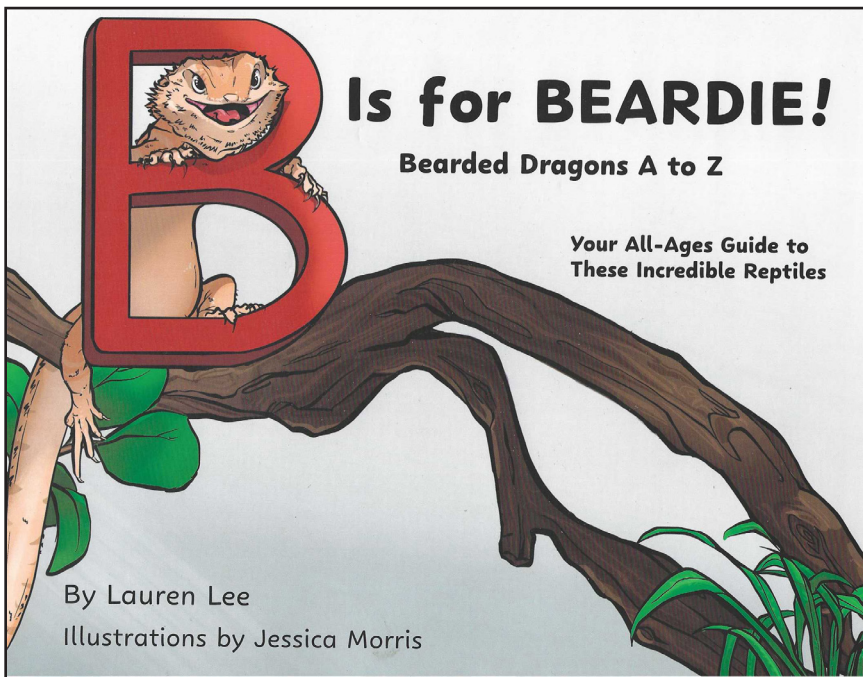
Stephen S. Hall
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It is not often that a nonfiction book hits the shelves that covers snakes in nearly all aspects of modern times. Rather than a book that details taxonomy or genres, *Slither* is a well written book that takes a look at how these animals intersect with society, with each chapter covering such diverse issues as metabolism and being cold blooded, venom, and the use of cutting edge technology to further study these reptiles. The

topics are wide ranging. One chapter discusses how drugs are developed with the aid of snake venom and how they could possibly be cures to diseases such as rheumatoid arthritis and sepsis, including the fact that Moderna co-founder Derrick Rossi's daughters keep corn snake morphs. Rossi also raised a nine foot reticulated python in his home, Hall noted in his book.

Another interesting chapter focused on the ball python trade and how the desire for "designer" snakes, or ball python morphs, had changed the landscape for reptile keepers, from that of a wild west type trading scene where wild animals were taken and sold to the highest bidder because of the demand for the newest species, to today with designer animals that are captive bred in someone's reptile room in the Midwest or the West Coast or the East Coast. Another chapter focuses on python hunting in the Holey Land Wildlife Management Area in South Florida, following python hunter Donna Kalil around as she discusses her work hunting pythons and, well hunting pythons. Kalil tells Hall how she hunts these pythons and the rules and regulations she must follow, including snapping a photograph, calling it in, reporting the position where the python is found and euthanizing the snake. For many, they may not know the rules the hunters must follow, so it is an interesting tidbit of information that Hall points out in *Slither*. It is a very interesting read that covers a wide variety of snake related topics.





same as you, it means I need to eat meat and veggies too!" covers the letter in the alphabet, the second page goes into more detail about omnivores, and in this case, provides a list of the occasional fruits, vegetables and meats to feed your bearded dragon, and why these foods are important to the health of your bearded dragon. The book is well illustrated and offers a wealth of information as well. It is a great guide for those children who are keeping a bearded dragon, or who are interested to learn what it takes to keep these lizards happy and healthy.

B Is for Beardie!

Bearded Dragons A to Z

Your All-Ages Guide to These Incredible Reptiles

By Lauren Lee

Illustrations by Jessica Morris

ISBN 978-1-966786-12-2

**B Is for Beardie!
Bearded Dragons
A to Z**

The bearded dragon is arguably the most popular pet lizard amongst reptile keepers. The reptile, native to Australia, has been widely captive bred in the United States and elsewhere around the world and is a mainstay in the hobby. The bearded dragon has become one of the most popular lizards with children and teens. They have made their homes not only in homes, but in school classrooms and libraries as well.

B Is for Beardie! Bearded Dragons A to Z by Lauren Lee is a care guide for the bearded dragon written in a way to clearly explain some of the care requirements to keep the bearded dragon healthy and inquisitive. It is written in an alphabetical format, meaning that from A to Z, the author writes about a specific topic that applies to keeping and observing your bearded dragon. While the initial sentence, for example "O is for omnivore; I'm just the

New Poison Frog Species Discovered in Peru

A new species of poison frog has been discovered in the Alto Purus National Park in Peru, a protected natural area in the country that is managed by Sernanp Oficial. According to Ministerio del Ambiente – Perú, the frog, *Ranitomeya hwata* is about 15 mm in length and is the smallest species in the *Ranitomeya* genus.

The frog is known for its bright and vivid coloration, including bright yellow dorsal stripes, a black band that separates the gular region from the belly and a mottled ventral pattern.

It is known to inhabit native bamboo forests on the Guadiana genus and uses the hollow chambers of the bamboo, which collect water, to reproduce. The scientists say that males recruit multiple females per breeding site in a display of polygynous behavior, according to a press release put out by the Peruvian government.

The research was conducted by Peruvian researcher Roberto Gutiérrez as well as Evan Twomey (Goethe University Frankfurt, Germany), Paulo R. Melo-Sampaio (Museu Nacional, Universidade Federal do Rio de Janeiro, Brazil), Jason L. Brown (Southern Illinois University, USA), Santiago Castroviejo-Fisher (University of Seville, Spain), Giusseppe Gagliardi-Urrutia (Instituto de Investigaciones de la Amazonía Peruana), José M. Padial (University of Granada and American Museum of Natural History), Juan C. Chaparro (Museum of Biodiversity of Peru) and Roberto Gutiérrez Poblete (researcher at the Museum of Natural History of the National University of San Agustín de Arequipa and specialist of Sernanp).

Green Sea Turtle No Longer Listed As Endangered

The green sea turtle (*Chelonia mydas*) has been removed from the International Union for Conservation of Nature and Natural Resources (IUCN) Endangered species status and is now listed as Least Concern, thanks

to decades of conservation efforts of the species. According to the IUCN, the population of the green sea turtle has increased by 28 percent since the 1970s when the reptile was placed on the IUCN Red List.

“Green turtles are keystone species in tropical marine ecosystems such as seagrass meadows and coral reefs, and have held cultural, culinary, spiritual, and recreational importance for people worldwide for millennia,” the IUCN wrote in an October 10 press release. “Conservation efforts have focused on protecting nesting females and their eggs on beaches, expanding community-based initiatives to reduce unsustainable harvest of turtles and their eggs for human consumption, curtailing trade, and using Turtle Excluder Devices and other measures to reduce the accidental capture of turtles in fishing gear.”

Studies over the years have pointed to a rebound in the populations of the species. Populations of green sea turtles in and around Hawaii and American Pacific island territories have increased, sometimes by an average of 8 percent each year since scuba diving researchers began counting them in 2002, according to a 2019 study published in the PLOS One journal. The researchers went around 53 islands, atolls, and coral reefs in the U.S. Pacific from 2002 to 2015 and counted more than 3,400 sea turtles, 90.1 percent of which were green sea turtles. Sea turtle counts around Hawaii experienced an 8 percent increase, while the number of sea turtles around American Samoa and the Mariana Islands increased by an average of 4 percent a year.

“The ongoing global recovery of the green turtle is a powerful example of what coordinated global conservation over decades can achieve to stabilize and even restore populations of long-lived marine species. Such approaches must focus not



JUAN CARLOS CHAPARRO/PERUVIAN GOVERNMENT

only on the turtles, but on keeping their habitats healthy, and their ecological functions intact. Sea turtles cannot survive without healthy oceans and coasts, and humans can't either. Sustained conservation efforts are key to assuring that this recovery lasts,” said Roderic Mast, Co-Chair of IUCN's Species Survival Commission Marine Turtle Specialist Group.

91 Eastern Hellbender Salamanders Released In Ohio

The Columbus Zoo and Aquarium and The Wilds wildlife sanctuary announced that they have released 91 eastern hellbender salamanders (*Cryptobranchus a. alleghaniensis*) into the waters of eastern Ohio, bringing to 2,000 the number of the amphibians the two organizations have raised and released since 2012.

The eastern hellbender is a keystone species that requires pristine, clean water and pristine health habitats to survive. If the water becomes dirty, the salamander cannot thrive in it and they perish. The zoo and the sanctuary are returning the salamanders to streams where they once thrived and have been made pristine again due to decades of conservation efforts.

“This is quiet work that adds up,” Greg Lipps, conservation biologist at the Columbus Zoo said in a post on social media. “One stream, one release, one more sign that clean water and wildlife can thrive together.”

In 2024, scientists found the first wild-



BRIAN GRATWICKE

born hellbenders from adults that had been released as part of the conservation efforts. This affirms the efforts are paying off to reestablish the species in its native waters.

Hellbender Salamander Information

Hellbender salamanders can only thrive in cool, clean water. Hellbender salamanders are listed as near threatened on the IUCN Red List of Threatened Species. Their bodies are fairly flat and their skin is folded and wrinkled. They breathe by absorbing oxygen through their skin, which is covered in mucus that is toxic to predators but not humans. Eastern hellbenders grow to more than two feet in length and is found in streams in the eastern United States to Mississippi.

They are fully aquatic salamanders and don't leave the water. They develop skin lesions when exposed to highly polluted waters. Nocturnal, the hellbender feeds on crayfish, dead fish, insects and other amphibians. They are prey to fish, turtles and snakes. They reach maturity in five to eight years and can live up to about 30 years.

Georgia Reaches Gopher Tortoise Conservation Goal

The state of Georgia's Department of Natural Resources announced today that its Georgia Gopher Tortoise Initiative has permanently protected 65 viable gopher tortoise (*Gopherus polyphemus*) populations in the state. The final population in the state's goal is an easement that will conserve and protect more than 250 tortoises as well as the pineland habitat in which they reside, totalling 1,210 acres.

The state launched the initiative in 2015. It has since grown to involve 30 state agencies, conservation organizations, companies, private landowners and private foundations, according to the Georgia DNR.

We're incredibly proud of the success of these conservation efforts. Avoiding federal listing not only helps protect wildlife, it also prevents potential economic impacts for our state,"

DNR Commissioner Walter Rabon said in a statement released to the media. "This collaborative approach has shown great promise as a model for successful wildlife conservation in the future."

When the initiative was launched, the state determined that only 26 of the 125 populations considered viable were protected. It was determined that 65 populations had to be protected in order to ensure the survival and thriving of the species in the state. Each population had to have at least 250 adult gopher tortoises for it to be considered a viable population. Its took ten ears to protect 65 populations as well as conserved 100,000 acres of habitat in south Georgia to ensure their survival. the state also restored longleaf pine ecosystems that the gopher tortoise.

"By leveraging the momentum of the gopher tortoise's candidate status and its cherished role as Georgia's state reptile,

we built a conservation strategy rooted in science and partnership," Peter Maholland, Georgia Field Office supervisor, U.S. Fish and Wildlife Service said. "Together with DNR, private landowners and dedicated non-government organizations, we identified high-quality tortoise populations and developed 'tortoise sheds' – a landscape-based approach inspired by watershed planning. This vision, championed by DNR's Matt Elliott and the late Don Imm of Fish and Wildlife, continues to guide our work and exemplifies how collaboration drives conservation success."

Gopher Tortoise Information

The gopher tortoise is an endangered species in western Alabama, Mississippi and Louisiana. It is listed as vulnerable by the International Union for Conservation of Nature (IUCN). It is considered a keystone species by scientists, due to its burrowing nature, which then helps an estimated 360 other animal species who take advantage of those networks of tunnels. The reptile averages about a foot long and can be found in along the coastal plains of the Southeastern United States, including South Carolina, Georgia, Florida, southern Alabama, Mississippi, and southeastern Louisiana. Gopher tortoises dine primarily on grasses in the wild and can eat beans, corn and most fruit. It is protected throughout its range and requires a permit to keep. **REPTILES**

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Respiratory Infections in Reptiles

BY ERIC LOS KAMP, DVM

For me, after nutritional diseases, respiratory infections are the most common presentation for my reptile patients. While these can be relatively simple in nature, if left untreated, respiratory infections can lead to severe disease and complications. This article plans to dive into how these diseases occur, what to look for, how to diagnose, and ultimately how to treat.

Respiratory infections in reptiles can be caused by a variety of different pathogens or disease-causing organisms. They can be bacterial in nature, viral like nidovirus, fungal, or even parasitic such as with lung worms. Regardless of the cause, certain factors predispose reptiles to such infections. As with many reptile diseases, husbandry is front and center. When environmental parameters are inappropriate, such as humidity or temperature imbalances, this can cause damage to the respiratory tract, allowing for opportunistic pathogens to take hold and cause disease. Environmental cleanliness can also play a factor. If the environment is excessively dusty or not properly maintained, this can cause similar damage to the respiratory tract or allow for continued re-infection (especial-

ly with parasitic pneumonias). Some conditions as well can always be present but only cause problems when the immune system is suppressed, such as *Mycoplasma* infections in chelonians and nidovirus infections in snakes.

Some signs of respiratory disease in reptiles can be quite marked, where there is copious amounts of frothy discharge from the mouth, watery discharge from the nares and eyes, open mouth breathing, or inability to maintain buoyancy (if an aquatic reptile). However, signs can be also very subtle. It can be as simple as lethargy, reduced appetite, and increased breathing effort. Breathing effort can be difficult to assess in reptile, but in general, if you can see a reptile breathing—which for lizards and snakes is rising and falling of the ribs and for chelonians increased gular



PHOTOS BY ERIC LOS KAMP

pumping and movement of the forelimbs—they are having issues breathing.

When a respiratory reptile case is brought to the clinic, I always start with a thorough review of husbandry, followed by the medical history of the progression of signs. My physical exam starts with simple observation of the animal's breathing and its activity levels, and then I handle the animal for a more thorough examination. The work up of some respiratory infections can end here, whereas other may require further digging. Radiographs always help to visualize the lungs to confirm the presence of pneumonia, while bloodwork may indicate the severity of an infectious process. For some species such as tortoises and ball pythons,





infectious disease testing for things such as Mycoplasma and nidovirus is important. If a respiratory infection is confirmed, I then prescribe an antibiotic to help with potential infection and also additional supportive care depending on the condition of the reptile. I also then go through the owner's husbandry to not only create the most conducive environment for healing as possible but also to reduce the chance of this issue recurring again. Additionally, I stress the importance of biosecurity, especially for owners with larger collections, to minimize the spread of disease. For my own Uromastyx, I was able to confirm her respiratory infection via radiographs and bloodwork. She is currently on antibiotics right now. At home, I reduced environmental dust in her enclosure and provided her a more appropriate humidity range with a bioactive enclosure.

When I start medical treatment for reptiles with respiratory disease, I then like to evaluate them halfway through treatment. Since reptile metabolism is slow, they take time to recover. While I do not expect them to make a complete 180 by the halfway mark, I do expect them to be improving. If a reptile is not improving by this time, I then proceed with a lung wash. This procedure requires me to sedate the reptile and infuse sterile fluids into the airway to collect for both cytology and culture. This testing allows me to figure out the primary causes of said pneumonia and find the appropriate antibiotic choice for the particular infection. These can provide me with quite a bit of information. I once had an ackie monitor that presented to me with a persistent pneumonia that I performed a lung wash on and ended up finding that there were three different bacterial organisms that were growing in the lungs that were resistant to the initial antibiotics. I've had similar experiences with a Russian tortoise, yellow-bellied slider, and Kenyan sand boa. With the sand boa, we were even able to find fungal elements in the culture, which for us indicated the usage of antifungals.

Overall, not every respiratory infection is the same, and collaboration between the client and the veterinarian is required in order to provide the best standard of care for the reptile. **REPTILES**

ERIC LOS KAMP, DVM, is an exotic animal and wildlife veterinarian at Winter Park Veterinary Hospital in Winter Park, Florida who has aspirations to board certify in reptile/amphibian medicine. In addition to being a member of the Association of Reptile and Amphibian Veterinarians (ARAV), he is an avid Ackie monitor keeper.



PHOTO BY MYTHIC PHOTOS/SHUTTERSTOCK

Pets As Presents: Thoughtful consideration of animals as gifts.

By USARK

The holiday season often brings thoughts of surprising a child or loved one with the pet of their dreams, but here is the truth: animal keeping is a commitment that can span decades. Instead of an impulse buy, we can ensure our pets thrive through careful planning and making informed choices about adopting or purchasing a pet that fits our unique family dynamics. A balance can be made that does not make light of keeping an exotic animal while respecting the choice of responsible pet owners. While this includes some specifics for reptiles and amphibians (collectively known as herps), the basics apply to all animals.

The Right Way to Add a Pet to Your Family

If you are serious about herp ownership, here are some tips on how to do it right:

Wait Until After the Holidays: It is wise to wait until after the festive season when life is less hectic and routines are more stable.

Buy it All but the Pet: Be prepared by buying everything

needed except the animal. You can give the setup as a present and then the pet can come home after the holidays. The enclosure can be prepared when the pet arrives. You could even include a picture, stuffie, 3-D printed, or other alternative pet representative.

Include the Whole Family: Make the selection process a family activity. Everyone should understand and agree to the responsibilities involved.

Start Simple: Consider species with care needs you can easily meet.

Remember the Reality of Responsibilities

Before bringing home a new pet, consider this: proper herp care requires specific temperature, humidity, and lighting requirements. No animal is a simple pet that you can set and forget. Species needs may include:

- Controlled environmental conditions (temperature, humidity, lighting, enclosure)
- Specialized dietary requirements
- Veterinary care
- Proper handling and socialization
- Appropriate substrate
- Secure, escape-proof housing

Planning Makes Perfect

1. Research First: Take time to learn about different species and their needs. Each species has unique requirements for

husbandry and handling. Some of the things to consider include:

- Adult size/length;
- Lifespan;
- Typical temperament;
- Space required;
- Diet/food availability.

2. Family and Other Considerations:

- Do you own a home or rent an apartment?
- Where will the enclosure be kept?
- How much time per day/week can you dedicate to pet care?
- Which member of the family will be the primary caretaker?
- What are your city and state animal laws?
- Is it too cold to safely transport a pet?

3. Budget Wisely: Factor in not just the initial cost but ongoing expenses for:

- Specialized lighting and heating equipment – replacement bulbs and heaters
- Regular food supplies – feeders and supplements
- Veterinary care
- Habitat maintenance – substrate, hides, enrichment

4. Find a Mentor: Connect with experienced reptile keepers or herpetological societies before deciding.

They can offer invaluable advice and help you navigate the complexities of animal ownership. If purchasing from a breeder, they are always happy to teach and give advice.

A Lifetime of Companionship

When done right, bringing herps into your home can lead to many years of companionship. These remarkable creatures become beloved family members – not through the surprise of a holiday reveal, but through careful planning and preparation.

Remember: The best gift is not the pet but the time, knowledge, and commitment you invest in providing a forever home for these extraordinary animals and passing along compassion for animals to future generations. REPTILES



PHOTO BY ROMAN TRASPOLSKY/SHUTTERSTOCK

The Lair of the Dragon

A passionate journey, in pursuit of the world's largest agamid lizards.

STORY BY ALEX MYERS

In situ Female *H. celebensis* at Bantimurung National Park.



Every reptile keeper dreams of seeing their favorite species in the wild. If you're going to dream it, then dream big.

My dream came in the size of the 11th largest island in the world — the Celebes, known today as Sulawesi in the Indonesian archipelago.

It was a dream conceived in college with my friends Aidan Withoff, a professional in ichthyology and botany, and Quinn Fulmer, one of the most well-versed individuals I have come to know in ornithology.

Earlier this year our dream came true when we were able to spend a total of six days in Indonesia, four of which was on the island of Sulawesi.

We arrived the first week of June 2025, just before the rainy season. We chose this time as animals would be easier to find



River running through Bantimurung National Park.



In situ Juvenile *H. celebensis* at Bantimurung National Park.

due to them anticipating the oncoming rain. The goal of our trip was to observe, appreciate and document as many species of flora and fauna as possible. My personal focus was on the sailfin lizards of the genus *Hydrosaurus*.

I didn't know it at the time, but no amount of research and studying could have prepared me for seeing a sailfin dragon in the wild.

What I Knew Going In

Initial accounts of sail finned lizards from the Celebes originate via Pieter Bleeker in 1860 under the classification *Istiurus microlophus* (DeRooy, 1915) from Ujung Pandang (presently known as Makassar, the capital city of Sulawesi).

The species name, *microlophus*, I find quite funny given the holotype specimen collected was a juvenile with an underdeveloped nasal crest (*micro*-small, *lophus* -crest). Ironically one of the key distinguishing features known today of *Hydrosaurus microlophus* is the presence of large and noticeable nose crest on adult specimens.

Perhaps my favorite species from the island was eventually described 12 years later, by herpetologist and taxonomist Wilhelm Peters: *Hydrosaurus celebensis* from Palopo on the eastern side of Sulawesi Selatan.

A beautiful black and gold lizard living among the branches and rocks of the

volcanic streams—a modern day Godzilla from Earth's natural forces! Presently, the genus *Hydrosaurus* contains five species. No subspecies are currently recognized. Sulawesi is currently the only known island with two species of sailfin lizard.

Bantimurung National Park

After a grueling 28 hours of flight time to Jakarta, (to which a contact of mine met me at the hotel and brought me a sailfin dragon to see) we slept for two hours, then headed to the airport for our flight to Sulawesi. We arrived at our hotel and obtained some much needed rest to recoup from flying to the other side of the world.

The morning of our second day on Sulawesi was the first chance of observing sailfin dragons in their natural habitat.

Our first location would be none other than Bantimurung National Park (BNP). Most known for the diversity of endemic butterfly species, it features a plethora of bird, fish, and other vertebrates and invertebrates that can be observed within the boundaries of the park.

The most desired species we were hoping to observe were the endemic Sulawesi crested macaque (*Macaca nigra*), various bird species unique to the highland areas, and of course, sailfin lizards.

In my opinion, one of the most unique

and naturally occurring features to be seen in the park is the volcanic rock making up the base of the water bodies. Eroding with the river current and making the water appear a beautiful teal coloration.

Upon entering the park and working up along the pre-paved hiking trail, we made our way up a metal staircase to one of the larger waterfalls. The rapidly churning waterfall transitioned to a calm flowing river at the top. It is safe to say that every herpetologist knows the feeling when things seem to feel "right" for their respective target species. Upon seeing a tree overhanging the river, I paused, falling behind as the group walked ahead. I stood on the path eyeing every branch with hopes to catch a glimpse of my quarry. Suddenly my guide stopped walking with the group and pointed at the tree I was scanning.

He looked at me and said the words I had been hoping to hear upon arriving: "Soa layar."

Perched above the water sat an adult male Sulawesi black sailfin dragon (*Hydrosaurus celebensis*). Based on our range, I was thoroughly surprised as the lizard more closely resembled what I have known as *Hydrosaurus microlophus*. This specimen comprised three rows of enlarged dorsal-lateral scale clusters. However, per various studies, the population of sailfin lizards within BNP are currently recognized as *Hydrosaurus celebensis*.

Even today, I still cannot find the right words to describe seeing a wild sailfin dragon doing exactly what their kind has been doing for millennia.

After taking some photos and admiring the male sailfin, we continued along the path that followed the river. Ahead on some snags we were able to view an adult female sailfin, this specimen looking more like *H. celebensis*. Truly baffling to me as she was roughly 200 feet from the male we had seen.

From a morphological standpoint I would not have expected her to look the way she did (though unlike *H. celebensis* showed in Denzer et al. 2020, this female had ever so slight enlarged dorsal scale clusters, though not as drastic as *H. microlophus*).

The female appeared almost stranded among the snags and woody debris in



Bantimurung National Park waterfall and highlands.



BTNP Female *H. celebensis*.



D. walkeri In situ.

the middle of the river. This was without a doubt an anti-predatory defense to avoid terrestrial predators from the banks.

It was a fine reminder to me of how these lizards can simply run across the surface of the water (a trait shared within the Central American lizards, *Basiliscus sp.*), or swim at great lengths without issue. She was no doubt feeling right at home and well aware we were not getting any closer to her.

It was only upon our walk back to the park entrance that we spotted a juvenile sitting not more than 15 feet away from the female we had seen earlier.

Western Sulawesi Selatan

The time had come for us to go night herping after our return from Bantimurung National Park. Truly wanting to maximize time after our visit to BNP, we sought more sailfins! "When in a place few have seen. sleep is for the weak!" Quinn said.

Per my request to our guide, we decided to visit a location in search of the Sulawesi giant sailfin dragon (*Hydrosaurus microlophus*).

The phenotype in particular that I was looking for is what I have referred to as the "southern" phenotype or what many Indonesians will call "Soa layar Malino"—more recently in various online forums, "Type 2 *H. microlophus*."

This variety of *H. microlophus* is characterized by its darker, near chocolate base color with black, well noticeable dorsal lateral scale clusters. Juveniles of this variety possess an olive green base color in contrasting the grey coloration seen with the "Type 1 *H. microlophus*."

Herping at night was the best way to admire sailfin lizards up close as they will run away quickly if approached during the day. After a long night drive and obtaining permission from a village elder to access the property to search for the lizards, I quickly stumbled upon our first amphibians of the trip: the endemic Sulawesi toad (*Ingerophrynus celebensis*). I was able to film and photograph a pair in amplexus—an incredible sight!

Time began moving fast as our guide aided us in scanning each and every overhanging branch along the streams of the property. The night mist rising

from the water tricked my mind into wanting to see the silhouette of my desired lizard. The first sailfin lizard of the night was a juvenile fitting the description of what I had been hoping to see.

The scale clusters were smaller, and the juvenile of this “phenotype” had an olive tint on it compared to the other look of *H. microlophus*.

Our time was cut short as a light drizzle began to come down. Our guide took me to one last spot before departing. That’s when we saw an adult male *H. microlophus* sleeping soundly above the water.

It was a textbook example of what I was looking for with the dark base coloring, smaller scale clusters, and no yellow or grey tones as seen with the other “type” of *H. microlophus*.

Other than the Sulawesi toads, our target species of the “Western” *H. microlophus* was fulfilled. Exhausted from a day that felt no different than the dreams of my college days, I was ready to doze off happily.

Eastern Sulawesi Selatan

Unlike driving to our location on the western side, herping on the eastern side of South Sulawesi would be different. This time my friends and I would be

camping in the jungle overnight next to a stream. I cannot emphasize enough the feelings and awareness one can get from camping, sleeping, and spending the day in the company of Mother Nature’s equatorial rainforest.

The further away we were from civilization, the more prevalent reptiles were. Within minutes of arriving at our campsite, 15 feet up a tree we witnessed two male *Draco walkeri* combat and display.

D. walkeri is another South Sulawesi endemic species and it was a magnificent sight to see them gliding overhead, stretching their elongated ribs in display along the tree trunks.

My friends and I were looking around the stream near camp and caught a glimpse of an emerald tree skink (*Lamprolepis smaragdina*). These individuals from Sulawesi are very unique as they possess a black stripe down the back of their body.

Continuing to walk along the stream, we caught glimpse of a juvenile and adult female *H. microlophus*. They saw us before we got a good look, as they scampered from the trees then launched themselves into the water. From what I could see, they matched the description of the “Type 1 *H. microl-*

ophus.” They had much larger, robust and prominent dorsal lateral scales with yellow along the chin, throat, and belly.

This population of *H. microlophus* is more grey in appearance than the populations we had seen on the western side of South Sulawesi.

Shortly after witnessing the escape of the *Hydrosaurus* we were surprised to see a water monitor (*Varanus salvator celebensis*) dart away from a high perch. The water monitors here are smaller and shyer than the larger subspecies from mainland Southeast Asia.

It was reassuring to see them sharing the habitat with *H. microlophus* as I recalled seeing a photo in the German magazine Saura where *V. s. celebensis* was photographed basking on a stream bank right alongside an adult male *H. microlophus*.

With dusk approaching, we encountered our first snake of the trip, a Sulawesi reticulated python (*Malayopython reticulatus*).

The reticulated pythons from Sulawesi are arguably some of the most beautiful of the species. The intense oranges and white along the side of their body features an interweaving pattern that gives them their name. The individual was approximately five feet in length and had just taken a large meal. In order to not disturb it too much, we grabbed a few quick photos and we went on our way.

As night carried on we ended up running into various species of forked-tongue frogs (*Limnonectes* sp.) and our second snake of the trip which nearly gave me a heart attack.

At first glance the fast moving snake appeared to be a cobra (*Naja* sp). However, it wasn’t until my guide said “rat snake” that we realized it was a Sulawesi rat snake (*Coloegnathus erythrurus celebensis*). We were able to catch a quick glance as it moved among the boulders and snags before disappearing from sight.

The morning of the fourth day started early to the sounds of birds. Once again we hiked the stream in hopes of locating some *Hydrosaurus* attempting to catch the first rays of sunlight.

Surprisingly, we were greeted with another snake. An adult Sulawesi mangrove snake (*Boiga dendrophilia gemmicincta*) was perched on a stick not too far from



Eastern *Microlophus* habitat.



Male Eastern *H. microlophus*.
Inset: Female *H. microlophus* comparison

where we camped. The snake let us know immediately that it was aware of our presence and proceeded to grace us with the classic mangrove snake threat display. It inflated its throat and opened its jaws highlighting its white mouth and rows of teeth. This provided the perfect photo opportunity and a moment to admire this beautiful rear-fanged colubrid.

Returning to the campsite to prep for the trip to Makassar, we finally had a good look at our target species of the area.

Perched on a winding snag over the stream was a large, adult male *Hydrosaurus microlophus* of the “Eastern” (or so called “Type 1”) phenotype. It was breathtaking to see the array of yellow along the chin and belly. The colors bled into the grey base among darker clusters of large dorsal lateral scales.

A red eye with hints of blue flecking made contact with mine as we acknowledged each others existence.

My inner 13-year-old self was near tears remembering the story of the “Ujung Pandang Sulawesi sailfin dragons” from Scott Corning’s website. Pertaining to his hybrid project to preserve the genetics/traits of a “rare undescribed Indonesian species with immense size and large dorsal lateral scales” he had obtained privately many years ago (Corning, 2017).

Now I was standing in front of the exact species in its home, breathing the same air and taking in the moment amidst the company of the king of Agamidae. Once he had enough of us, he sprinted across the stream and boulders effortlessly, disappearing into the dense vines and snags along the stream bank. It was a perfect way to end the trip in the company of Sulawesi’s dragon.

Takeaways

My goal of this trip was to locate and observe *Hydrosaurus* in the wild and doc-

ument their respective phenotypes. While my time with *H. celebensis* was brief and restricted to Bantimurung National Park, it was clear that the animals observed in that region of the park differed drastically in appearance from animals documented in other papers (Denzer et al, 2020. Hamzah et al. 2023.).

I suspect the highland region that runs through the center of South Sulawesi acts as a geographic barrier separating the two distinct phenotypes observed of *H. microlophus*.

Whether or not these two population phenotypes are subspecies, or completely separate species is above my pay grade, but it is worth noting that each side of the South Sulawesi peninsula is clearly home to two drastically different looking sailfin lizards— both presently under the classification of *Hydrosaurus microlophus*.

I hope that my anecdotal findings encourage taxonomists and herpetologists



South Sula reticulated python.

to dive further into understanding these lizards. There is much more to learn from the genus *Hydrosaurus*. I intend to return to the lair of the dragon.

The author would like to thank Ari Flagle of Eco-Tropic Adventures for ensuring safety and transport throughout Indonesia. Ari's guides for assisting with the language barrier and helping locate sailfin dragons in the wild. Aidan Withoff, Quinn Fulmer, and Ari Flagle for allowing use of photographs taken during the trip for the article. **REPTILES**

ALEX MYERS has worked at numerous public and private facilities caring for and breeding a multitude of reptile and amphibian species. His personal work in herpetoculture focuses primarily on *Hydrosaurus*, *Physignathus*, and other lizard species within the family Agamidae.

More Articles by Alex Myers

- Understanding The New *Hydrosaurus* Species
- <http://bit.ly/4nXHVRE>
- The Way of the Water Dragon
- <http://bit.ly/4gYMKYv>

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Eastern *H. microlophus* head profile.



Male *H. microlophus* comparison.



Aidan and Quinn on a bridge in the river at Bantimurung National Park.

TOM CRUTCHFIELD

Crutchfield has captive bred and born over 200 species of reptiles from Nerodia to Sanzinia!

STORY BY FOSTER REVES

Tom and Stacy out herping.

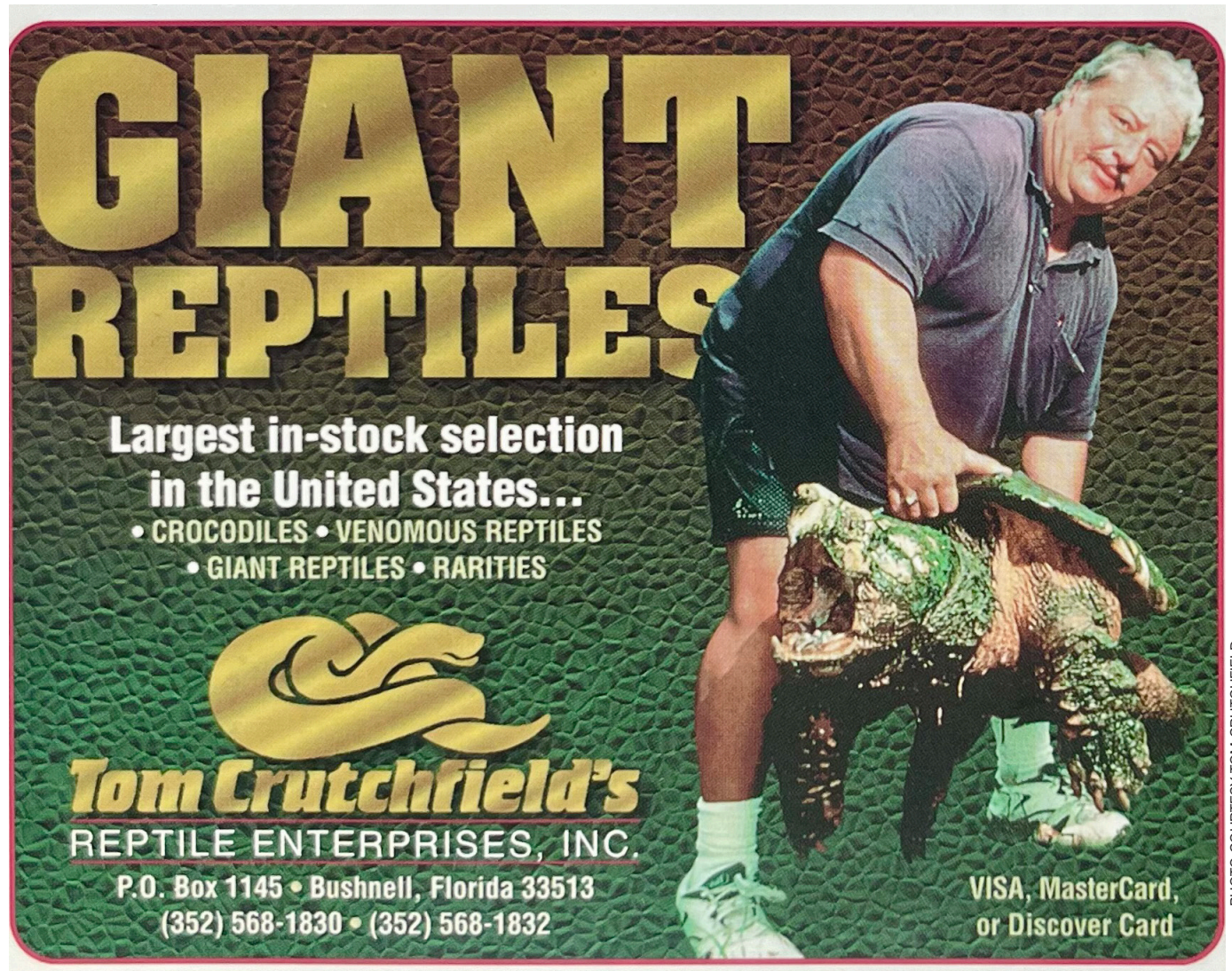


Unless one has been living under a rock for the past 50 years, Tom Crutchfield is a name that nearly every serious reptile enthusiast has at least a passing familiarity with. Born in Marianna, Florida in 1949, Tom began interacting with reptiles and amphibians at a young age. He would earn extra money by catching snakes, including rattlesnakes, for the Ross Allen Reptile Institute. Tom is one of the founding members of the hobby as we know it today, boasting many accomplishments. These achievements include breeding numerous species, including many for the first time, education, and field work such as participating in conservation studies with the San Salvador rock iguana, *Cyclura rileyi*. Having experienced his share of trials and tribulations over the years, Tom generously agreed to speak with us for this interview.

FR: Hello Tom and thank you for taking time out of your day to engage in this interview. Much has been written about you but for those who may be unfamiliar could you tell us a little about your childhood and early interests in reptiles?

TC: Well, the earliest interest that I had with reptiles started with dinosaurs. I turned my first rock over in the yard at 6 years old and found that ringneck snake, that was the beginning of it all. I kept it in a jar and then released it. Then I learned how to find more. That was a time of great learning.

FR: You had a good start going into the beginning modern age of herpetoculture. Specifically, I am referring to the early to mid-80's. During this



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Tom with an early advertisement for Tom Crutchfield's Reptile Enterprises.

period the hobby was becoming more popular however the husbandry magazines that arose closer to the end of the decade had yet to come about, the herp book boom had yet to begin, and of course we did not have the internet around back then. Were there any special challenges that you faced getting your name out there?

TC: I put a pricelist out during the 1980's, called Herpetofauna Incorporated and it became a very, very large business over the next 10 or 15 years. There was also Herpetofauna International with Hank Molt, Western Zoological Supply with Jim Brockett and Barney Tomberlin, and all that sort of stuff. Basically, I was trying to make a living and learn how to keep as many reptiles as I could, because dealers get in more different kinds than any other place, zoos, or whatever. I wanted to see everything, so I put a pricelist out every month. Eventually that list grew to all the AZA Zoos in the US, little roadside zoos, and private people. At one point I think that we had 8,000 to 10,000 people on the mailing list. I say mailing list because we made lists out, thousands of them at a time. The greatest expense that I had was the pricelist. It was 32 cents a stamp for each list a month, every month.

FR: Do you think that the Bimini boa would be considered the gateway species that encouraged you to start collecting animals in other countries?

TC: Yes, it was because until recently the only thing that I could hope for would be going to the Everglades, or some unique part of Florida that I had not been to before. I had already been studying Caribbean boas at that time anyway and a lot of my friends were going to Bimini and catching them on the weekends. We collected in remote areas. On one trip we found an abandoned area where deserted boats were stored. We found a rolled-up sail stored in a building, and after pulling it down we discovered 24 boas. That was the most that we had ever found at one time.

FR: What are some of your most memorable experiences from these travels?

TC: Well one is the perception that collecting in the Caribbean was against the law, but it was not in that time period. I spent the most time in the Caribbean during my 20's, until I was about 30. This would have been in the 1970's when CITES was barely even heard of, and mostly not enforced. Everybody just caught whatever they wanted to bring back. They declared what they collected or just let the animals be discovered, because it just didn't matter. No one really

cared. I mean I know it sounds terrible but that is how it was.

FR: During this time when you were importing large numbers of animals, at what point did you begin to focus more on establishing breeding populations?

TC: Well, what really slapped me in the face so hard were my first journeys around the world. I made three trips around the world, and this would have

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PHOTO COURTESY TOM CRUTCHFIELD

Tom with an albino cobra.

been the 1980's. When you were as young as I was, you go to wet markets in Asia as well as other places. In Thailand we called it the Sunday Market, it's the one in Chatuchak now. The live animal market was just unbelievable. Orangutans were for sale then. You could buy elephants, fish, any species you could possibly think of. Imagine a square mile of little tents, all private vendors, all selling legal and illegal stuff out front, and nobody cared. Some were critically endangered, and they were kept in horrible conditions until they died. It hit me in the face what was happening. I would look at the animals and think about this, especially during the Caribbean trips. You do realize that there are hardly any Bahamian taxa of *Cyclura* in captive hands in the US? None of them were really brought in much, other than a very few. These went to the old private part of zoos. We didn't catch them on purpose because we were worried about other pressures, like the locals hunting them for food. The only species we took were mostly rhino iguanas, which were very common back in that time.

FR: What are some of the species that many take for granted today that may not have been available if it were not for your efforts?

TC: I brought in 300 bearded dragons, *Pogona vitticeps*, early on. They mostly came from Switzerland. At least some of those survived to be bred. I wasn't the only one that brought them in either. There were albino Burmese pythons. I had the first ones of those. Bob Clark got his from me that certainly was a big one involved in herpetoculture, particularly with morphs. Ringed pythons were brought in by Ed Celebucki and sold to me. There were about 20 to 24 snakes, and they served as the founder population for what we have in the US now. Ed and Hank Molt also brought *Woma* pythons in from Sydney.

FR: Tom you are a special breed of reptile keeper, even from the start. The average hobbyist does not keep venomous snakes until more experienced in the hobby, much less have crocodylian breeding ponds in the backyard. Approximately how many



Tom went around the world several times.

different species do you think that you have worked with over the years and how many have you bred?

TC: I have captive bred and born over 200 species of reptiles from *Nerodia* to *Sanzinia*! I know that I've bred 10 species of crocodylians, five species of *Cyclura*, both kinds of emerald tree boas, *Corallus canius* and *Corallus batesii*, the list goes on. There is *Iguana iguana*, *Iguana delicatissima*. I've bred hundreds of Cuban crocodiles; they were in my backyard too (Tom laughs). I've bred every species of *Chilabothrus* but three, two of which were only recently described. These include the Dominican red mountain boa (*C. striatus*), Jamaican Boa (*C. subflavus*), and Abaco Island Boa (*C. exul*).

FR: Tom, you have seen a lot of field-collected animals on dealer's lists come and go over the years. Which species would you like to see hobbyists and breeders put more work into sustaining?

TC: When I choose reptiles to captive breed, I look at three factors. First, I must like the species I pick. Second, I choose to breed higher end reptiles as most buyers do not purchase on an impulse due to cost; and third, I choose a species in need for conservation purposes. Examples would be tree monitors, boas in the *Chilabothrus* genus, *Cyclura*, and so forth.

FR: I remember receiving your stock lists by mail back in the 80's. In addition to an incredible selection in general, you offered high-end species found nowhere else, some going for six figures. Can you tell us a little about some of your exclusive clientele?

TC: We sold a lot of expensive stuff back then; it was sort of our last form of public existence. Zoos were major buyers. We were the first to offer albino American alligators to herpetoculture. Alligator Adventure in Myrtle Beach, South Carolina, got some of those. I also provided Alligator Adventure with a large male Sunda gharial, which I raised from a young juvenile in one of my crocodylian ponds.



Stacy with some natives



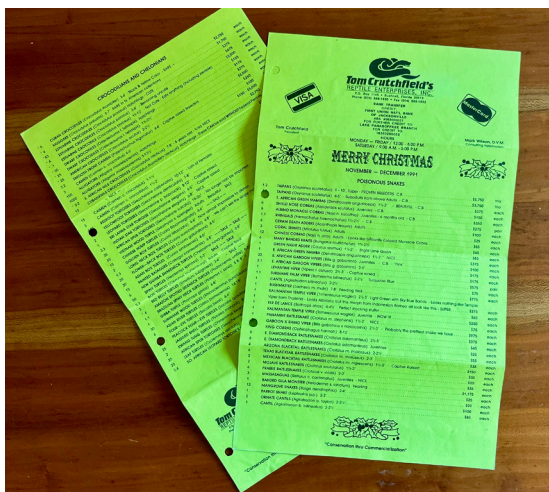
Stacy with Bill, a crocodile monitor she has a fantastic relationship with.

FR: Have you ever been bitten by a venomous species or suffered an attack by a large lizard or crocodilian?

TC: I have been bitten three times by venomous snakes. I've never been bit handling a venomous snake, I had two bites through a bag, one bite was an Osage copperhead, which caused me a little damage to my finger, but I didn't seek medical treatment. Then I got bit by a west African green mamba through a bag, but it was a dry bite. About 10 years ago I had a big SW speckled rattlesnake bite. It was too fast and barely hit me on the hand, but I didn't have any envenomation. I've never had to take antivenin thank goodness. The worst I've ever been hurt by any reptile was a crocodile monitor bite about seven years ago. It damaged my finger, crippled my left index finger, permanently. It looks like I have a snake bite finger, it was just a warning bite, but I was in the hospital five days and had to have a blood transfusion.

FR: That does not sound like fun.

TC: (laughing) Yeah, it was the worst



Tom's famous price list circa 1991. He sent it out to 8 to 10,000 addresses at \$0.32 a piece.

I've ever been bitten. I had a Gila monster bite me one day too, it was a terrible day that Gila monster bite, but nothing like that croc monitor bite (as he continues to laugh). After a lot of pain and swelling the Gila bite had no residual effects albeit the crocodile monitor bite was life changing and permanently crippled my left index finger.

FR: In addition to providing ample and humane space, what advice would you give those who are thinking about working with more unorthodox species, such as venomous animals, crocodilians, and large lizards?

TC: It goes back to this, only keep an animal if you can allow it to be the animal that it actually really is. If you can't allow that, then perhaps you should choose a different species. To provide for a six-foot iguana is not the same as for an *Anolis equestris*.

FR: I absolutely love your philosophy of keeping fewer species and providing more space for what is being kept. In addition, it seems that you are influencing others to follow suit. What arguments would you give to those who may still feel that a minimal enclosure size is satisfactory?

TC: There is a difference in keeping an animal alive, or allowing it to thrive, a huge difference. Reptiles can sort of tolerate substandard conditions. A basic reptile cage can be viewed as a life support system. As an analogy a human being can be kept in a closet, as long as it is cleaned, and food and water are provided. Once the human grows up it may even reproduce if given a mate. Obviously, a situation like this would have profound psychological implications on that human, and it is the same with reptiles. One thing reptile people don't take into account or really understand is the amount of intelligence and mental holdings that these animals really have.

The same question that I always ask the people that criticize me for my stance on keeping giant snakes in Vision cages and the like is, just give me one reason, why keeping giant snakes in small cages benefits the kept, and not the keeper? Give me one reason and I won't criticize anymore. Every single reason that they can give you for keeping them in smaller cages is that it can keep them alive and fed, but the animal doesn't understand this. I also want to point out that I am not targeting any particular individual with these statements, if someone feels targeted then maybe they should reexamine their husbandry methods. I have kept snakes in large wire cages outside for years, even back in the 1980s. Over the last 15 years I have even increased the size of these cages even more. People would ask, don't they rub their noses? They do not because they have habitats inside the cage with temperature gradients, live plants, and all

kinds of stuff. I want to increase the size of their habitats so that they can be the creatures that they really are. Most big pythons like to climb, and many lizards like to dig. When housed in this manner there is a very noticeable difference in how they respond to their keeper. I had crocodiles in my front yard for years. My false gharials are huge and had like a fourth of an acre enclosure in the front, but I would never keep something like that if I had not had the ability to provide for it in this manner.

FR: It is no secret that many keepers tend to anthropomorphize their animals. While this is certainly part of human nature, many people will argue that, with certain exceptions, most animals kept by the average hobbyist may learn to associate human presence with food but otherwise seem indifferent to their keepers. You have pushed past this base interaction however and have formed real bonds with so many of your animals. Could you tell us about some of these relationships?

TC: Well, you know to be perfectly honest with you in our later years here nothing has ever tried to bite anyone here, except for the cobras on the venom line, even the other venomous animals like the Gilas. The main memory is about the big Mangshan viper that I imported 15 years ago and subsequently raised. She was gigantic and that was the only venomous snake that I have ever totally trusted not to bite. If I were to go into her cage, she would uncoil and crawl over. I have pictures of her coiled up tight on the bottom, with that big head on top, with my hand laying on top of her and her doing absolutely nothing. If I waited a minute, she would climb up on my shoulders. I've never seen anything like it before or since. I've never trusted any venomous reptile before like that. I had her as a baby. I was careful never to scare her, as she grew, she became very non-afraid of us, and very forgiving. One time she did a feeding strike. I saw the big head coming fast toward my hand but all of a sudden, the big head stopped, and she put her head down on top of my hand. She aborted a full strike, full Monty, right before contact, when she realized what the target was. Kristine Bialecki, who is well known on Facebook, was here and saw that. She taught me so much more than I would



Outdoor enclosures are a big part of Tom's ranch in Florida. Below: A Bahamian boa.





PHOTO COURTESY TOM CRUTCHFIELD

Tom has never been administered antivenin, despite being bit three times.



PHOTO COURTESY TOM CRUTCHFIELD

An outdoor enclosure gives reptiles natural UVB.

ever know by being so forgiving. I'm not an academic, my classroom has always been the living reptiles.

FR: Tom, you have done a fantastic job with that.

TC: Thank you, sir.

FR: Could you explain the concept of Umwelt?

TC: Umwelt means reality is viewed in different ways and how the animal adapts. Umwelt is a German ethological word that basically says that every organism reacts with reality in a different way. For instance, the world of a catfish, versus the world of an iguana, versus the world of a monkey, and so it goes. Unless one can understand the umwelt of the animal, the behaviors, where they come from, where they originate from, it's very hard to understand the ethology, basically what not to do. Some people seem born that way, Stacy is one of those people, and she is an amazing person.

FR: Funny that you mention that because I want to ask about her in the next question.

FR: Tom, tell us about your wife Stacy. I really wish that this question could begin on a more upbeat note. Throughout the course of this interview, she has suffered a life-threatening bout with bacterial and fungal pneumonia. She was intubated while hospitalized, then transferred to a rehabilitation facility, and even after returning home her condition is not improving.

During one of our telephone conversations, you shared that she is still not fully ambulatory. To make matters worse, the extensive IV antibiotic regimen that she received while in the hospital has now resulted in Stage 3 liver failure. You went on to say that there is an upcoming appointment at the Cleveland Clinic in Ft. Lauderdale to determine the options, especially if she transitions to Stage 4 liver failure. Let me say that I am so sorry and can only imagine what you are going through. As a nurse I know well how traumatic these situations are for family members. I speak for the entire herp com-

munity when I say that our thoughts and wishes are with both of you. How long have you two been together? She obviously shares your passion for animals. Does she have any favorite species?

TC: Well, this past June (2025) will be 10 years, and we have been married six years, and we have been a couple for eight years, a long time. She has many favorites but one is Hemingway, one of our rock iguanas. We have them loose in the side yards. They don't even have cages, they live there. We have five big *Cyclura* that live in partitions, mainly chain-link fences, which are not particularly difficult for them to get over (Tom laughs), but they don't, they understand their territory. Those are some of her favorites. Bill, the big crocodile monitor, Stacy has a remarkable relationship with him, and honestly, she taught me a lot of the croc monitor ethology herself.

FR: Tom, your notoriety as a smuggler decades ago is well documented in various books as well as on television. If this were to happen today, in the age of the internet, I suspect that the knee jerk reaction of the faceless hordes online would be coming after you with digital torches and pitchforks. This said, you enjoy a huge respect in our community, not only in the US but across the globe. People go out of their way to shake your hand and have pictures taken with you at shows. What do you think accounts for this?

TC: It was a different time then. I have just never claimed to be anything I'm not. I've never lied about anything I've ever done, it's factual, a part of history that you just can't deny. Did you know that zoos participated in rattlesnake roundups back then? Zoos were more concerned about getting animals for exhibits than where they came from.

Once I received some water monitors that actually turned out to be Gray's Monitors (*Varanus olivaceus*). Several zoos bought them quickly. Some of the stuff I'm sorry I did, and some of the stuff I'm sorry that I didn't do more of. It was never completely about money either.

FR: Tom you are a key character in



Tom and Stacy out herping.

PHOTO COURTESY TOM CRUTCHFIELD



Stacy with an albino cobra.

PHOTO COURTESY TOM CRUTCHFIELD

Eric Goode's upcoming HBO docuseries about the herp community. Could you tell us about this experience?

TC: He started filming in 2011, and then one day Mark McCarthy shows up in

my yard with a snow leopard, and Tiger King was born. I knew Eric before, when he had the night club, Area, in New York City. He had a lot of movie stars attend. He was a Hotelier too, and he had reptile exhibits in his nightclub. I provided reptiles for some of those exhibits. I knew that he was a big turtle and tortoise guy, and I applaud what he has done conservation-wise around the world. I did not, however, realize to what great extent he was taking. He took a lot of pictures, but I did not expect any movie like that, because that's not what he told me it was about. He had other people that he filmed also that you will recognize. After Tiger King, he comes back and wants to video tape me again. I don't know if I want to do it or not. If I had not filmed for five years before Tiger King came out, I never would have done it. Since he had already filmed me, however, I decided to explain and do the best I could.

FR: Tiger King and Chimp Crazy both featured some unique characters which did not reflect well on big cat and primate keepers. Did you ever get the sense that Eric may paint the reptile industry in a bad light?

TC: No, not at the beginning. It's a mixture of excitement and dread post Tiger King. Eric and I have been friends for a long time however so I will give him the benefit of the doubt.

FR: Tom thank you so much for agreeing to participate in this interview. We wish Stacey a speedy recovery and hope that your transition to your new place is as seamless as possible. Are there any parting words that you would like to share with our readers?

TC: It's bittersweet, but it's the last of my big reptile farms down in Homestead. I loved the way I lived for years and years and years, until I became an old man, literally, me living in the place I lived if that makes sense. Anyway, when life serves you lemons, you turn it into lemonade.

REPTILES

FOSTER REVES is a SW Virginia based Registered Nurse and freelance writer. Foster lives with his two amazing kids and too many other animals to list.

The Axanthic Water Monitor Morph

Breeding the first Axanthic to Axanthic water monitor morph in the United States.

STORY AND PHOTOS BY ZAC ALA



Two hatchlings.

The island of Java is a beautiful, tropical rainforest island formed by volcanic eruptions. It is the world's 13th largest island and is home to a stunning array of flora and fauna. One of which has always caught my attention, the Axanthic water monitor (*Varanus salvator*).

The Axanthic water monitor is a natural occurring morph that prevents the animal from producing yellow pigment. It is a recessive gene, meaning you would need two carriers of it to produce a visual animal. In the Axanthic morph, the normal yellow is now a glowing white, brown is grey and the black is a deeper black. They are stunning to say the least.

The Axanthic morph is super rare as the exact area where they are found has yet to be confirmed. Some educated guesses believe somewhere between Central and East Java.

The mysterious origin and rarity of the gene on the island of Java has made the story of captive breeding all the more adventurous. That is where our journey begins.



Hatchling smelling the air.

In 2021 I acquired an adult male Axanthic. At the time, he was one of only a few in the country. He was absolutely breathtaking to see in person. There were no captive bred Axanthics available in the U.S which gave me the desire to start a breeding project. That is when my search for a female began. It wasn't going to be easy as I had never seen an adult female Axanthic available. Two years passed and I had no luck. Eventually I met someone who had a female. Of course neither one of us wanted to give up our Axanthic to the other. So a plan was hatched (pun intended). We would work together and produce the very first Axanthic to Axanthic babies in the U.S.

That would turn out to be easier said than done. We lived on opposite sides of the United States. Jason in Florida and me in Arizona. I flew my male to Florida to be with Jason's female. No success. Six months later both male and female came to Arizona for one last shot. Being here in Arizona was not any better. We agreed that the animals were not compatible and the size difference was too great. That's the tricky part with water monitors, you have to hope the pair gets along. If they don't it can turn dangerous quickly. That's exactly what happened in our case. The male was too large and the female too small for him to successfully lock up with her. This frustrated him which caused him to be aggressive with her to the point it was no longer safe. The project was dead. The possibility of finding another male or female was slim. We had invested over a year with this pair.

Then seemingly out of nowhere Jason called and said he found a younger adult male. He purchased him and had him shipped directly to me. We both felt we had a divinely orchestrated new chance. The first obstacle with the new male was tapeworms. No big deal though as this is very common with water monitors. After three weeks of treatment, he was good to go. The day had come to introduce the new pair. All the feelings were happening; excitement, fear, anxiety and hope. Within 30 minutes we had a lockup. The male was closer to her size and made it much easier to breed. They bred on and off over the next three days. Once breeding stopped they were separated. The first



Digging the nest.



The baby about to hatch.

PHOTO COURTESY TOM CRUTCHFIELD

step to success was complete. Thirty days later she laid 11 perfect eggs. The second step complete. The third step was incubating. You have to be a very patient person or learn to be because this step can take over 200 days before a baby hatches. Thankfully, we got a little break and the first baby pipped at 186 days. The black and white pattern of the very first US captive bred and born Axanthic was amazing and we had 10 more! Years of hard work had led to this!

Now let's get into the specifics. Acquiring new animals, caging, heating, nest box and incubation have very specific details to be successful in breeding monitor lizards.

ACQUIRING NEW ANIMALS

The first step after acquiring your new animal whether its for a breeding project or as a pet is to make sure it doesn't have parasites. Going to the vet with a fecal sample is your best bet. The most common parasite in wild caught water monitors are tapeworms. One way to recognize your lizard has tapeworms is to keep them warm, 85-88 degrees ambient, with a basking spot of 115-140 degrees. After keeping your lizard at these temps 24/7 for a week or two their insides are stimulated and will start to release parasites. If they have tapeworms you will find them in their bowel movement and most likely in their water.

CAGING & HEATING

With breeding being our goal, temps and caging will be based on that. In our project, wild caught Axanthics were used as no captive bred were available. Wild caught adult monitors are not keen on human interaction so a door connecting the male and the female enclosure was used. This allowed the lizards to walk into each other's space on their own rather than me physically moving them. This prevents any unnecessary fear responses. This enables the pair to completely focus on breeding. This has proven to be successful in other breeding projects. When breeding monitors, keeping temperatures consistent is key. Temperatures of 80 to 88 degrees Fahrenheit (26.7 to 31.1 degrees Celsius) with 85 degrees Fahrenheit (29.4



One of 11 hatchlings.



A clutch of eggs ready to hatch.



Hatchlings out of their shell.



Check out the patterns.

degrees Celsius) being the sweet spot 24 hours a day, seven days a week. Keep humidity around 60% with peaks going up to 90%+ after spraying is crucial as it mimics their natural environment.

FEEDING

Feeding is more important with the females as it triggers cycling and gives ample energy and resources to produce eggs so feed them plenty. Medium size meals work well. The heat and the extra food will cause her to cycle. Males are fed once or twice a week as you don't want an overweight male in a breeding project.

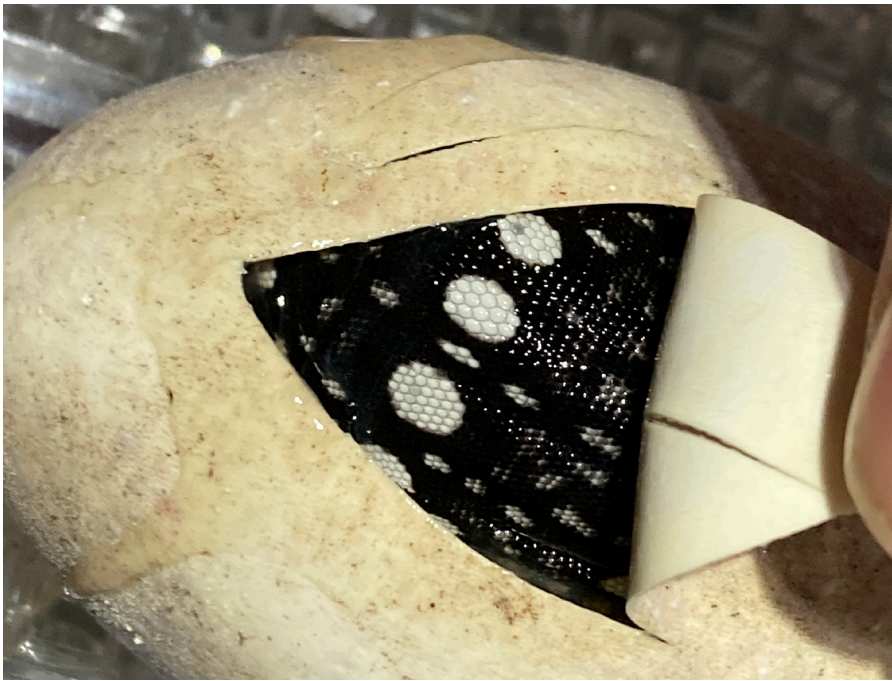
NEST BOX

This is not as complicated as you might hear. I use a 55 gallon tote and a mixture of play sand and sphagnum peat moss combined well to get a salt and peppery look. Make sure you are using 100% peat moss with no fertilizer in the ingredients. Place a log in the nest box as the lizard likes to lay their eggs along side of it. Add water until moist but not wet. Place a heat mat on the bottom or side of the outside of the tote. I like to use the Zoo Med tortoise heat mats best.

EGG INCUBATION

This is the longest step of the whole breeding process and you'll want reliable equipment. First is a good incubator. There are many companies that make them or you can make one yourself. Next is the container, I prefer the Sim container which is the suspended incubation method with water crystals. Set your incubator temperature to 86 degrees Fahrenheit (30 degrees Celsius) and wait six to seven months for the eggs to hatch. I open the Sim container every 30 days for just a minute to refresh the air.

What a journey!! What started as a love for a unique animal on the other side of the world turned into an adventure I will never forget. The Axanthic morph is an amazingly beautiful morph and I am convinced it will play a giant role in the future of captive water monitor breeding. Axanthic and albino making snows, Axanthic and sulfurs, there are so many morphs it could be introduced to. The future is black and



A hatchling ready to come out. A nest is dug and the eggs deposited.



The eggs in incubation.



The log in the nest box

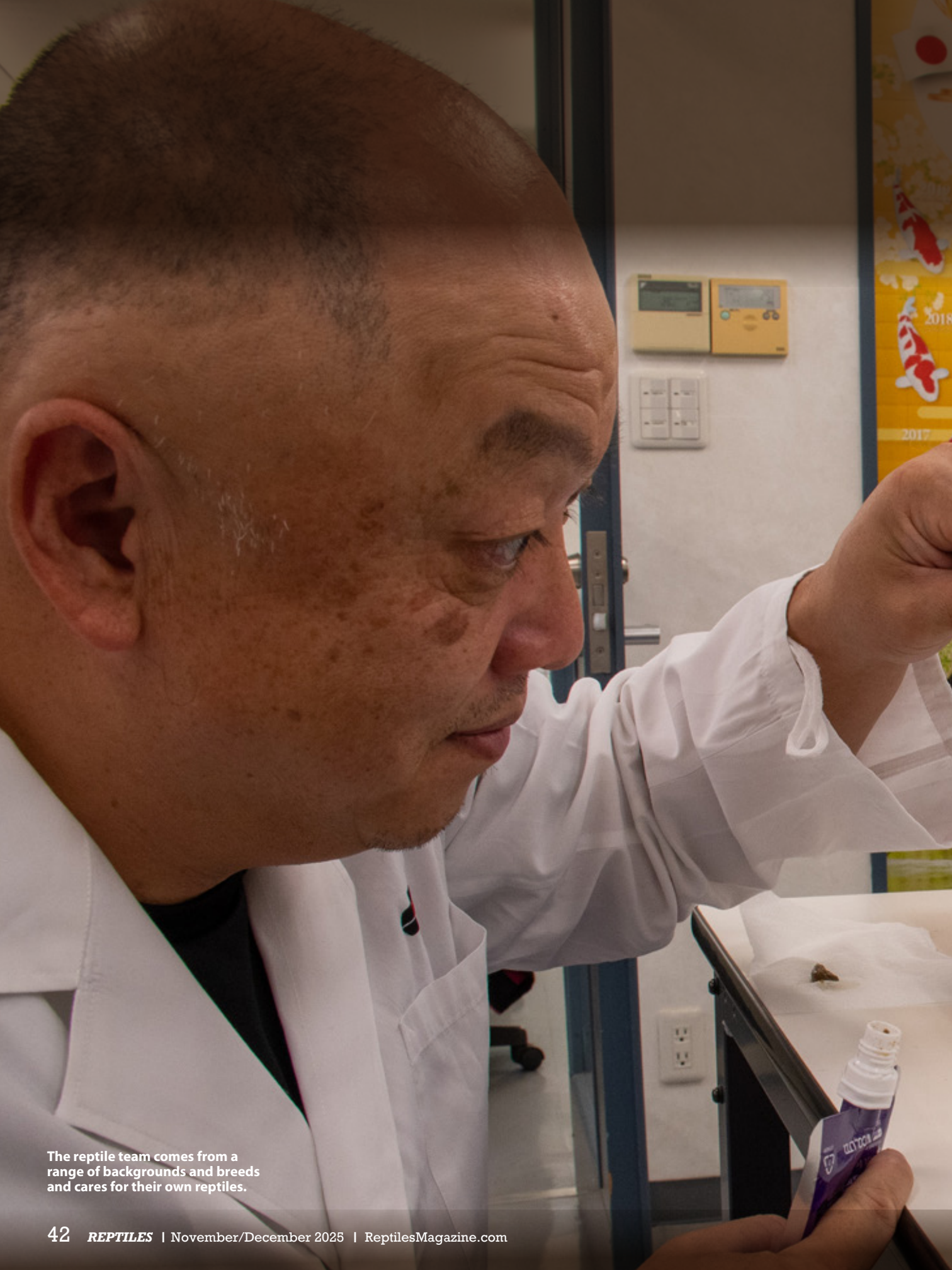
white when it comes to this starry night morph we call Axanthics. **REPTILES**

ZAC ALA has loved and kept reptiles over the span of 32 years and has worked at reptile pet stores, reptile rescues and spent 7 years as a reptile manager in the zoo industry, where he cared for and bred rare and endangered reptile species. He now owns and runs ALA Reptiles where he breeds captive bred reptiles specializing in *Varanus salvator* and has had great success breeding never before bred morphs and localities. You can find him on Instagram <https://www.instagram.com/alareptiles/> and on YouTube @ALAREPTILES



Gravid female





The reptile team comes from a range of backgrounds and breeds and cares for their own reptiles.

Hikari USA

From Ornamental Fish Husbandry
to the U.S. Reptile Hobby.

STORY BY RACHEL PRESSER



PHOTO COURTESY HIKARI

When it comes to feeding your pet reptile or amphibian, it tends to be less “universal” than feeding a cat or dog where most of them eat pet food that comes from a box or can. Advanced keepers may feel no qualms about thawing timelines for their snake’s frozen rodents or handling a toad’s steady diet of live insects, but novice keepers and those with large numbers of pets tend to gravitate toward the gecko equivalent of a bag of Purina.

Enter Japan-based Hikari with its wide variety of reptile, amphibian, and fish diets that have an astonishingly intricate development process behind its gels and pellets.

Entering the Reptile Hobby

Hikari’s origins date back to the late 19th century when Tozaemon Kamihata cultivated koi fish to keep as pets and became revered in the world of Nishikigoi, the husbandry and breeding of koi fish. Japan is a world leader in ornamental fish

keeping and breeding and the time-honored tradition of Nishikigoi dates back centuries, with more than 80 different varieties of koi fish kept and bred in Japan today.

Kamihata’s descendants opened Kamihata Fish Industries Ltd. in southern Japan in 1961 as a Nishikigoi breeder. The dawn of a new era of Nishikigoi culture arose when its Kamihata Sanke koi won the championship at the All-Japan Nishikigoi contest in 1964.

What set Kamihata apart from other

Nishikigoi breeders was that it had a long history of making its own koi fish diets. Now a household name in the Nishikigoi world, Kamihata Fish Industries adopted the name brand Hikari and started exporting its fish food under this name. By the late 1970s, Kyorin Food Industries Ltd. became Hikari’s production division with its flagship factory in Kasai City in the Hyogo prefecture.

Today, there are three Hikari factories and multiple warehouse and packing facilities in Japan, along with 65 worldwide distribution centers.

Building on its success in the Nishikigoi world and evolving the culture, Hikari began breeding tropical fish in 1985 and marine fish in 1999. After decades of research and development, Hikari made its commercial debut in the reptile hobby in 2017 with its gel diets for geckos. In addition to its world-famous exotic pet food, Hikari is the largest shipper of live tropical and marine fish in all of Japan.



Turtle formulations are tested on Hikari’s own captive bred species.

PHOTO COURTESY HIKARI

Hikari's Species-Specific Process

Hikari trademarked "Species-Specific" for good reason: the research and development team meticulously studies every species in their labs. Springboarding from their history of keeping and breeding multiple generations of koi, they breed and keep their own reptiles, amphibians, and arachnids. To best ensure the long-term viability of Hikari diets and the diets' effects well into the future, the R&D departments breed and care for their own multi-generational Pac Man frogs, crested geckos, bearded dragons, frogs, spiders, turtles, and other animals.

With R&D staff coming from a wide range of backgrounds including animal nutritionists and zoologists to hobbyist reptile keepers and scientists, they also take their skills outside the lab. Prior to testing sample diets in the Hikari Aquatic Laboratory, the R&D team does ecological expeditions in the animals' native habitats to study the climate, water conditions, breeding requirements, what they eat in the wild, and aspects of reptile and amphibian health. The R&D team is also split into specific divisions for aquatic pets and reptiles, with a balance of staff from scientific and veterinary backgrounds and non-science backgrounds with reptile husbandry experience.

Per Hikari USA spokesman Chris Clevers, "We have been formulating nutritional diets for over 30 years not only based on nutrition science found in academic papers and reference books, but also by incorporating advice from veterinarians, animal caretakers, relationships with public facilities and first-hand experience."

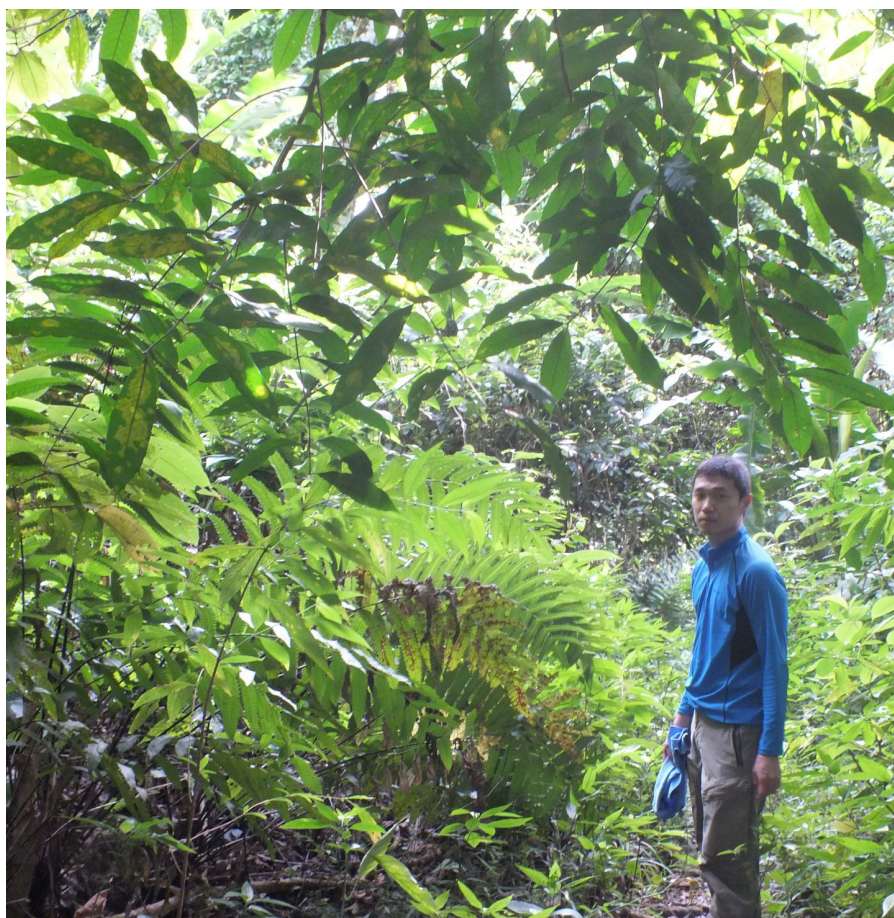
As a pioneer in commercial amphibian diets, it took Hikari's R&D team several decades to get their first reptile gel ready for market. This is because in addition to devising a nutritionally-sound formula that can meet your pet's dietary needs without supplementation, they also aimed to develop a product that your pet is excited to eat. It needs the right flavor, texture, and taste so that it won't be ignored or passed over for a different food that you offer to your pet.

Every pet reptile is different, of course. Your bearded dragon may be just as picky as a human child when it comes to eating their veggies while another bearded dragon will demolish any greens in their

Mulberific Delite is a food for tortoises and herbivorous lizards.



Herping expeditions are a big part of Hikari R&D.



The Hikari R&D team goes out and sees reptiles in their native habitats to help understand what they eat.



Hikari LeopaGel was introduced in 2017 as a food for leopard geckos.



LeopaDelite is formulated for insect eating reptiles.

path. But the larger the quantity of a specific reptile that eagerly comes up to a Hikari test product, the closer it is to market-ready. The team places a high priority on ensuring that reptiles that eat their food are excited to eat, rather than reluctantly taking a few drops to stave off hunger.

Eliminating the Messy Aspects of Feeding Your Reptiles

What sets Hikari's ready-made reptile diets apart from others on the market? Not only are they designed to appeal to your pets based on years of research and experimentation, including what they gravitate to in the wild, but Hikari diets are also intended to be as pleasant as possible for humans to handle.

Packaged reptile diets don't always smell like a botanical garden. If you are sensitive to strong smells in human foods that are safe for some reptiles, like eggs, it can also make feeding your pets unpleasant. You'll make the sacrifice because you love them, but Hikari's R&D team wanted to find ways to make that sacrifice unnecessary for herptile pets.

Hikari's specialized reptile diets like LeopaGel and Dragon Delite are designed to drastically cut out the smelly, messy, and time-consuming aspects of reptile

husbandry that keepers like the least, all while having all of your pet's necessary vitamins and minerals in a pre-mixed and ready-to-use format. On account of the reduced waste and cleanup, keepers can spend more enjoyable time with their pets and focus on socializing, interaction, and their overall health.

Reptile keepers also have the assurance that Hikari has complete control over their production process. In the event that there's a quality control issue, lots of each diet are easily traced for recalls and refunds. A common problem in the pet food industry, for virtually any kind of pet, is that customers may be unsure whether the brand they are buying from manufactures the product or simply markets it. When reptile keepers buy Hikari reptile diets, they have the peace of mind that they purchased from the company that manufactured it and that a complex web of animal nutrition R&D processes went into each package.

Today, Hikari sells ready-made diets for leopard geckos, crested geckos, Pac Man frogs, bearded dragons, turtles, and grass-eating tortoises. They also sell frozen and freeze-dried treats like blood worms and brine shrimp for omnivorous reptiles.

REPTILES



Visiting The Phoenix Herpetological Sanctuary:

STORY AND PHOTOS BY BRYAN KAO



American crocodile



Located in Scottsdale, Arizona, a short drive away from the similarly noteworthy reptile center known as Rattlesnake Ranch, Phoenix Herpetological Sanctuary touts that it is the largest rescue center for reptiles and amphibians in the United States. Founded in 2001 by three reptile enthusiasts and now run by a team of 16 staff members and 50 volunteers, this non-profit organization started as a safe space where abandoned, abused, and illegally kept, confiscated reptiles live in peace with professional husbandry. Ninety percent of the animals in its collection hail from the pet trade, and they provide public outreach on how to keep pet reptiles healthy and happy. They hope that the public can adopt their rescued animals as an alternative to purchasing from the trade.

Occupying 2.5 acres of land in the desert, this sanctuary has two primary missions: rescue and rehabilitation of non-native and native Arizona species, in tandem with conservation education about ecology, desert biomes, and

sustainability. It is only open to the public through booked events, such as 90-minute general tours and summer camps for elementary school students. Tours can be booked online and only occur at set times each day.

Upon arrival at Phoenix Herpetological Sanctuary, guests are welcomed by a sandy desert paddock that is home to adult sulcata tortoises (*Centrochelys sulcata*) with plenty of shade, hides, and burrows. First, they check in for their tour at a small building next to the parking lot with a front desk and a small gift shop. Tortoises are by far the most frequently surrendered category of animal to the sanctuary: at the outset of the tour, a guide shows guests numerous Russian tortoises (*Testudo horsfeldii*) and the Arizona native Sonoran desert tortoises (*Gopherus morafkai*) subject to local conservation projects. There is a brief photo op session where guests are allowed to hold these two species with guide supervision. Next, the guide unlocks the front gate to the sanctuary compound and welcomes the tour group into a plaza.

The first part of the plaza focuses primarily on the world's top three largest tortoises, with a mixed-species yard



Arizona toad

for adults of Galapagos giant tortoises (*Chelonoidis niger sensu lato*) and Aldabra giant tortoises (*Aldabrachelys gigantea*), and a second sprawling yard for more adult sulcatus. Their neighbor is a single capybara (*Hydrochoerus hydrochaeris*) who has access to a swimming pool; he is the star of a separate animal encounter program bookable as a private tour. Other mammals with outdoor enclosures here include a South American Coati (*Nasua nasua*) and a bat-eared fox (*Otocyon megalotis*).

Another highlight of this plaza is a pool enclosed by a chain-link fence home to a group of handsome, primeval-looking black caimans (*Melanosuchus niger*), some of the only ones in the United States. A side area is home to larger lizards, including rhinoceros iguanas (*Cyclura cornuta*).

Next up is the exciting Venomous Snake Building, in which more than 200 elapids, vipers, and other snakes of over 70 species, most of which were confiscated from being illegally kept, live in rows of vivariums. Behind glass, guests can also see glimpses of the largest antivenom bank in the western United States. This collection provides not only emergency measures for the safety of the sanctuary's venomous snake keepers, but also for staff in participating facilities that pay a membership fee for access to the antivenom.

Many of the highlights in this hallway



Black caiman

are elapids, and some of the most iconic ones at that: there's the imposing king cobra (*Ophiophagus hannah sensu lato*), speedy black mamba (*Dendroaspis polylepis*), verdant Eastern green mamba (*Dendroaspis angusticeps*), fishnet-scaled Western green mamba (*Dendroaspis viridis*), and the death-feigning rinkhals (*Hemachatus haemachatus*). Some members of the true cobra collection here are the bold-ringed banded water cobra (*Naja annulata*), the glossy black-necked spitting cobra (*Naja nigricincta*), yellow-and-gray Equatorial spitting cobra (*Naja sumatrana*), gold-and-brown cape cobra (*Naja nivea*), dark chocolate Moroccan cobra (*Naja haje legionis*), yellow Samar

cobra (*Naja samarensis*), and the cookies-and-cream Indochinese spitting cobra (*Naja siamensis*).

This collection is also particularly strong in Australasian elapids, featuring the famously venomous inland taipan (*Oxyuranus microlepidotus*), reddish Collett's snake (*Pseudechis colletti*), brown Papuan pygmy mulga (*Pseudechis rosignolii*), rusty-banded Northern death adder (*Acanthophis praelongus*), and the draconic rough-scaled death adder (*Acanthophis rugosus*).

Pit vipers include many of the North American native rattlesnakes, copperheads, and cottonmouths also present at Rattlesnake Ranch, such as Western



Banded water cobra

Boomslang



Collett's snake



Equatorial spitting cobra



Great Basin rattlesnake (*Crotalus lutosus*), and Florida cottonmouth (*Agkistrodon conanti*), but also the island endemic Tortuga Island rattlesnake (*Crotalus tortuguensis*), critically endangered Martinique lancehead (*Bothrops lanceolatus*), massive black-headed bushmaster (*Lachesis melanocephala*), black-and-yellow Okinawa habu (*Protobothrops flavoviridis*), and others.

Non-pitted vipers include the fancy-patterned Ethiopian mountain adder (*Bitis parviocula*), artichoke-scaled Western bush viper (*Atheris chlorechis*), chunky puff adder (*Bitis arietans*), rhinoceros viper (*Bitis nasicornis*), desert-colored Cyclades viper (*Macrovipera schweizeri*), sand-swimming desert horned viper (*Cerastes cerastes*), and many, many more. Other venomous snakes include a melanistic boomslang (*Dyspholidus typus*) and the rare-in-captivity Southern stiletto snake (*Atractaspis bibronii*), a burrowing asp that can side-stab with its fangs!

The venomous snake hall leads into a children's classroom where summer camp and school programs are held, with tables for reptile-themed arts and crafts as well as a few tanks of harmless reptiles and amphibians, such as a derpy three-toed Amphiuma (*Amphiuma tridactylum*).

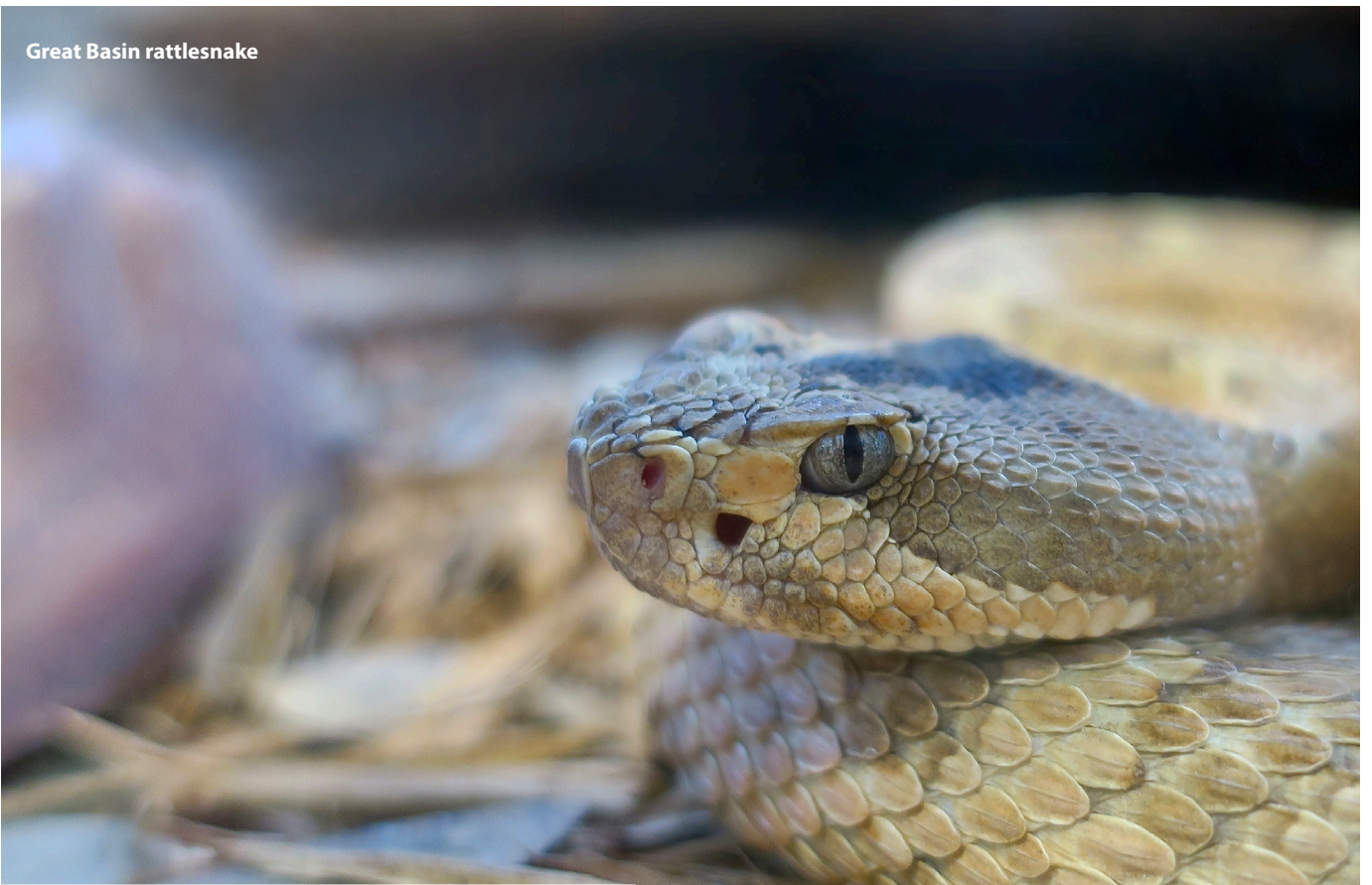
Next on the tour, guests are guided into the crocodylian section, an outdoor yard with plenty of pools and turf substrate enclosed with chain-link fences. The vast majority of the world's crocodylian species are represented here, with highlights including a male American crocodile (*Crocodylus acutus*) and a female black caiman who is thought to be the oldest of her kind in captivity. Of some American alligators (*Alligator mississippiensis*), one was rescued from being dumped in the Grand Canyon, and another was confiscated from an organized crime ring. Around the yard, there's crocodylians of all shapes and sizes, from giants like Orinoco crocodiles (*Crocodylus intermedius*), thick-bodied ones like New Guinea crocodiles (*Crocodylus novaeguineae*), long-snouted ones like the slender-snouted crocodile (*Mecistops cataphractus*), to wide-faced ones like broad-snouted caimans (*Caiman latirostris*) and many morphologies in between. In addition to the current collection, the Sanctuary also plans on importing from Madras Crocodile Bank some gharials (*Gavialis gangeticus*) and mugger

diamondback rattlesnake (*Crotalus atrox*), canebrake rattlesnake (*Crotalus horridus*),



First sulcata tortoise exhibit. Below: Florida cottonmouth





Urothoeke unicolor

crocodiles (*Crocodylus palustris*), so be on the lookout for those in the near future!

The final section of the tour is the second building, a barnyard chock full of glass-door vivariums of all shapes and sizes. Residing in them are a motley assortment of rescued lizards, snakes, and amphibians who are mostly former pets, as well as some local native fauna. There's strong focus here on boas and pythons, like a massive green anaconda (*Eunectes murinus*), gray Bimini boa (*Chilabothrus strigilatus fosteri*), reddish Hispaniolan boa (*Chilabothrus striatus striatus*), sausage-bodied Bornean blood python (*Python breitensteini*), Papuan python

(*Drymarchon melanurus unicolor*) and plenty of *Lampropeltis* king and milk snake species and subspecies. Some noteworthy lizards here include the marble-eyed Halmahera giant gecko (*Gehyra marginata*), stout and spiky Egyptian uromastyx (*Uromastyx aegyptia*), rough-skinned starred agama (*Laudakia stellio*), and the New Guinea locality of frilled lizard (*Chlamydosaurus kingii*).

As for amphibians, some native species are displayed, such as the spotted lowland leopard frog (*Lithobates yavapaiensis*), pudgy Arizona toad (*Anaxyrus microscaphus*), vibrant red-spotted toad (*Anaxyrus punctatus*),

(*Apodora papuana*), iridescent Boelen's python (*Similia boeleni*), and many others.

Colubrids include the false eyelash-toting Urothoeke unicolor

and the well-hidden Couch's spadefoot (*Scaphiopus couchii*). At the end, before the tour is dismissed, the guide hosts one last photo op with tractable snakes and lizards, such as ball python (*Python regius*) morphs and Indonesian blue-tongued skinks (*Tiliqua gigas*).

Besides the altruistic work they do in saving the lives of reptiles and amphibians as well as promoting proper husbandry and pro-conservation mindsets, Phoenix Herpetological Society does excellent work showcasing scaled biodiversity. Taking a tour with them through their impressively diverse collection is like watching the reptile world's "greatest hits," some of the most iconic species, leap off the pages of a field guide and pose in front of their fans. It is truly a memorable animal rescue center like no other, strongly emphasizing educational outreach, cultivating empathy, and also piquing and sustaining interest in herpetological creatures. **REPTILES**

Halmahera giant gecko



Martinique lancehead



Saguaro cactus



Venomous snake hall

Holiday Buyer's Guide

BY JULIANA VIRATA



Roly Poly Kit – CT-RPK

Zoo Med's Roly-Poly Kit gives a window into life underground. The included Creature's Soil, leaf litter, and cork bark create the perfect mix for these decomposers to eat and dig. The Creature's Isopod Calcium Block ensures that isopods can build strong exoskeletons. Enjoy learning about the natural history and care of roly-polies with the included guide and poster! Zoomed.com



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Jumping Spider Kit – CT-JSK

Zoo Med's Jumping Spider Kit is perfect for these arboreal spiders. Jumping spiders have great color vision, and the clear design allows ample light through for them to hunt prey. The included Creatures Eco Soil and a hydration spray bottle help maintain proper humidity. Also includes a climbing branch, Guide to Jumping Spiders, sticker, and poster. Zoomed.com



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20G Leopard Gecko Kit – NT-L20

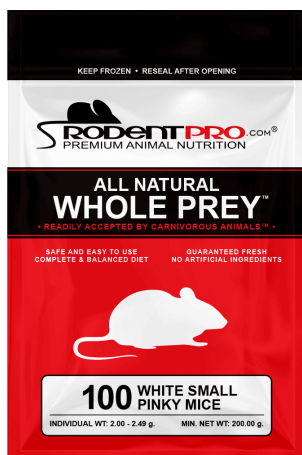
Take the guesswork out of setting up your leopard gecko or fat-tailed gecko! This kit provides the basics your pet will need to get started and includes:

- 20-gallon terrarium with screen top
- ReptiSand – 20 lbs
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- Nocturnal Infrared Heat Lamp – 75 w
- Repti Rock Water Dish – Medium
- Habba Hut – Large
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- ReptiVite™ Reptile Vitamins
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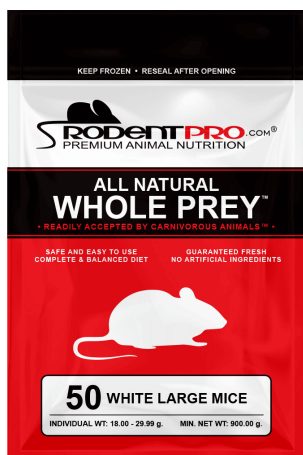
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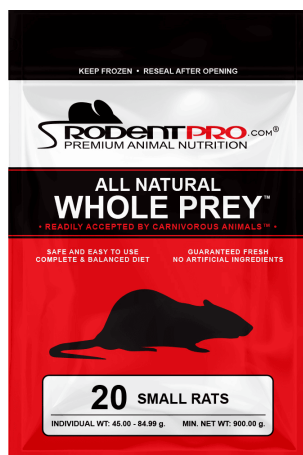
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Small Rat →

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Medium Rat →

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Holiday Buyer's Guide

SlitherSense (RT-50, RT-51, RT-52)

SlitherSense by Zoo Med is an easy-to-use platform for monitoring your pet's terrarium. Sensors track both temperature and humidity, and detailed graphs can be viewed from any internet-connected device. Add multiple pets and sensors to each habitat and set alerts if parameters fall outside of preferred values. Zoomed.com



Blue River Diets

The Fruit and Bug diet is a protein packed diet enhanced with vitamins and minerals for a complete diet. It consists of fragrant fruit blended with bulk-building bugs, has added honey and bee pollen for natural sweetness, and other essential protein, fibre, vitamins, minerals, antioxidants, and probiotics. It's a great diet for Crested Geckos and other fruit eating reptiles. blueriverdiets.com



The Blue River Diets Gecko Diet Bundle

Five different fruit based foods. These include Watermelon Burst, Strawberry Swirl, Pineapple Crush, Mango Madness, and peach Paradise. They are ideal diets for crested geckos and other fruit eating reptiles. blueriverdiets.com



Zen Habitats 4'x2'x2' Reptile Enclosure

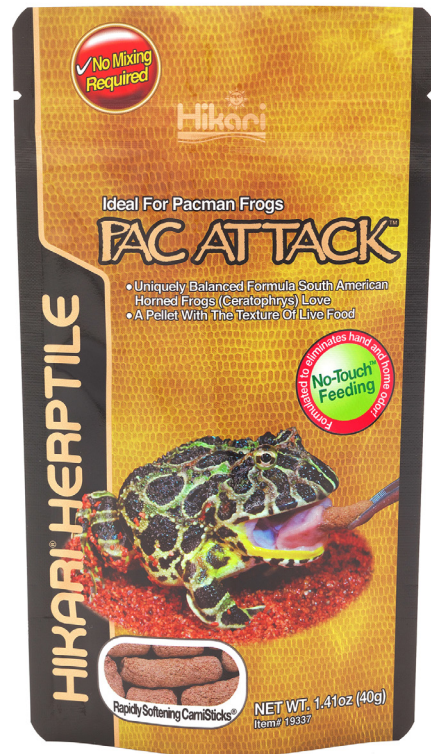
The Zen Habitat 3.0 is a customizable terrarium for your reptile to help them feel at home. This enclosure is designed to be versatile, durable, and stylish. Its 4'x2'x2' size supports arid, tropical, and bio-active setups, making it ideal for species like Bearded Dragons, Ball Pythons, and many others. It's built from high-quality materials with superior heat retention, it keeps your pet comfortable while lowering energy costs. It's quick and easy to assemble, with expandable design options and a 6" substrate shield, making it perfect for natural burrowing as well as front opening, non-reflective doors to reduce animal stress while also allowing for easy access for cleaning and feeding. This habitat is a great option for your reptiles! zenhabitats.com



Holiday Buyer's Guide

Hikari Pac Attack

Hikari presents the world's first rapid-feed pacman frog diet, Pac Attack. This unique, highly flavorful stick takes on the consistency of a live animal once wet! It's an easy to use food that doesn't require mixing, hand forming or when used with feeding tongs, any touching. Just pick up the stick with tongs, dip it in pure, fresh water and feed to your pet. The perfectly sized package provides value without fear of the food going bad before you can use it all. hikariusa.com



Hikari Gel Items For Reptiles

Hikari introduces a new line of ready-to-use reptile diets. LepoaGel is scientifically formulated for the leopard gecko or other insect eating lizards. CrestGel is scientifically formulated for the crested gecko and other fruit and insect eating lizards. DragonGel is scientifically formulated for bearded dragons and other vegetable eating lizards. Gone are the days of mixing food, the hassle, smell and wasted product. The 30 day supply is packed in an Oxy-Stop dual format package with an easy-feed spout for proper proportion offerings. No additional supplementation is required as each diet provides all the minerals required. Continued exclusive use will provide a noticeable reduction in waste odor and stickiness thereby reducing the time required for enclosure maintenance. We also offer Dragon Delite for adult Bearded Dragons or other vegetable eating lizards with larger appetites. hikariusa.com.



Hikari Mulberific Delite For Tortoise & Herbivorous Lizards

Mulberific Delite is scientifically formulated for grass eating tortoises. Mulberific Delite provides all the vitamins and minerals required to avoid deformed shells along with unique hydration and retention properties which provide tortoises with the moisture intake they require for good health. The addition of our proprietary probiotic, "Hikari-Germ", offers additional benefits. Continued exclusive use will provide a noticeable reduction in waste odor and stickiness thereby reducing the time required for cleanup and maintenance. hikariusa.com.





Hikari Leopa Delite

Leopa Delite is a scientifically formulated pellet for larger leopard geckos and other insect eating lizards. This easy to use stick when hydrated makes an easy transition from our wildly popular LeopaGel diet. Best of all, no additional supplementation is required as Leopa Delite provides all the minerals required. For more information contact Hikari Sales USA, Inc. at (800) 621-5619 or email at fish@hikariusa.com.

Saki-Hikari Turtle

Saki-Hikari® Turtle

Saki-Hikari® Turtle is the world's most advanced turtle diet from the undisputed leader in species specific nutrition, Hikari. It's the diet of choice for turtle keepers who hate foul water and the bad smells that are commonplace. With uniquely developed odor-stop ingredients which also offers superior digestibility, increased digestive capacity, active waste decomposition, extremely high feed efficiency, improved immune system support, proper shell development, noticeably better water quality due to waste composition your filter can more readily handle. This technologically advanced diet includes the Hikari Germ. Our test results showed up to 50% cleaner water and as much as an 88% reduction in common turtle tank ammonia odor. For more information and availability of Saki-Hikari Turtle contact Hikari Sales USA, Inc. (800) 621-5619 or email us at hikariusa.com.



Holiday Buyer's Guide

Exo Terra PTC Self-Regulating Heat Mat

The Exo Terra PTC Self-Regulating Heat Mat is designed to be suitable for reptiles, amphibians, and invertebrates with the goal of providing them with optimal thermoregulation and climate control. It is energy-efficient and serves as a conductive heat source, has an automatic fail-safe programmed, and is fast warming and self-regulating temperatures to help prevent hotspot heating. It is ideal for all glass type terrariums with a self-adhesive backing and IPX6 water resistance. It's energy efficient and has a rugged design, increased lifespan, and has improved safety features and an automatic fail-safe. exo-terra.com.



Exo Terra Ultrasonic Humidifier

The Exo Terra Ultrasonic Humidifier is a high performance fogger that allows for an increase of humidity levels up to 100% RH, which makes it great for creating a visual effect within the terrarium. It simulates a natural fog, with low clouds and early morning dew to mirror both tropical and desert terrariums. The humidifier itself is easy to install with an adjustable output and a 4.5L reservoir, making it perfect for multiple terrariums or ones of different varying sizes. It has a whisper-quiet operation and comes with an LED water-level indicator, a flexible 48" hose, and an automatic shut-off feature. Its idea for use with the Exo Terra Thermostat & Hygrostat. exo-terra.com.



PROCOCO Premium Coconut Husk

PROCOCO premium coconut husk is 100 percent organic and is great for pet reptiles. It is a sustainable alternative to peat moss and helps keep your enclosures moist as it is a great holder of humidity. It comes in three Compressed Coir Block Types: Compressed CocoChip Block, Compressed CocoPeat Block, and Compressed Chips-N-Fiber Block, all ideal for a wide variety of reptiles. These chips are very low in salt and dust and are widely available in the United States. Prococo.com.



FAST FACT:

There are 10,000+ reptile species! In fact, the known species of reptiles around the world keeps rising. This makes them more diverse than mammals.



Exo Terra Monsoon Nano Misting System



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November

Nov. 1: Glendale, CA; Southwestern Herpetologists Society Meeting; The Ranch House at Deukmejian Wilderness Park; 3429 Markridge Road; Info: <https://swhs.org/>

Nov. 8: Gettysburg, Pa ; Gettysburg Reptile Expo; Allstar Events Complex, 2638 Emmitsburg Rd; Info: <https://gettysburgreptilexpollc.com>

Nov. 8-9: Sulphur, LA; HERPS Exotic Reptile and Pet Expo; West Cal Event Center, 401 Arena Rd. <https://www.herpshow.net/>

Nov. 9: Manchester, NH; New England Reptile Expo; Doubletree Hotel; 700 Elm Street; Info: <https://reptileexpo.com>

Nov.15: Huntington, WV; Reptiles at the York Expo; York Expo Center, 334 Carlisle Avenue, York, PA; Info: <https://mdreptilefarm.com/>

Nov. 15-16: West Monroe, LA; HERPS Exotic Reptile and Pet Expo; West Monroe Convention Center, 901 Ridge Ave. <https://www.herpshow.net/>

Nov.23: Huntington, WV; West Virginia Reptile Expo; Marshall Health Network Arena, Downtown Huntington, 1 Center Plaza, Huntington, WV; Info: <https://www.wvreptileexpo.com>

Nov. 22-23: Johnson City, TN; Repticon; Holiday Inn Johnson City; 101 W. Springbrook Drive; Info: Repticon.com

Nov. 23: White Plains, NY; New York Metro Reptile Expo; Westchester County Center; 198 Central Ave, White Plains 10606; Info: <https://reptileexpo.com>

Nov. 23-24 Knoxville, TN; Repticon; Chilhowee Park & Exposition Center Jacob Building, 3301 E Magnolia Ave. Info: Repticon.com

Nov. 29-30: Raleigh, NC; Repticon; North Carolina State Fairgrounds - Exposition Center; 4285 Trinity Road; Info: Repticon.com

December

Dec. 6: Glendale, CA; Southwestern Herpetologists Society Meeting; The Ranch House at Deukmejian Wilderness Park; 3429 Markridge Road; Info: <https://swhs.org/>

Dec. 6-7; Austin, TX; HERPS Exotic Reptile and Pet Expo; The PAC, 8220 183A, Leander, TX 78641; <https://www.herpshow.net/>

Dec 7-8; Orlando, FL; Repticon; Central Florida Fairgrounds Main Building Halls A, B, & C; 4603 W Colonial Dr; Info: Repticon.com

Dec. 13-14; Slidell, LA, HERPS Exotic Reptile and Pet Expo; The Harbor Center, 100 Harbor Center Blvd; <https://www.herpshow.net/>

Dec. 20: Port Charlotte, FL; Repticon; Charlotte County Fairgrounds, 2333 El Jobean Rd, Port Charlotte, FL 33948; Info: Repticon.com

Dec.21: Huntington, WV; West Virginia Reptile Expo; Marshall Health Network Arena, Downtown Huntington, 1 Center Plaza, Huntington, WV; Info: <https://www.wvreptileexpo.com>

Dec. 20-21: Fayetteville, NC; Repticon; Expo Crown Complex A/D; 1960 Coliseum Drive; Fayetteville, NC 28306; Info: Repticon.com

Dec. 28: Breinigsville, PA; Greater Lehigh Valley Reptile Expo ; 100 Event Center At Delta By Marriott Allentown, 7736 Adrienne Dr; Info: <https://www.reptifestexpos.com/greater-lehigh-valley-reptile-expo.html>

January

January 3-4: Atlanta, GA; Repticon; Gwinnett County Fairground; Entertainment Building & Expo Center; 2405 Sugarloaf Parkway, Lawrenceville, GA; Info: Repticon.com

Jan 10-11: Los Angeles, CA; Reptile Super Show; Pomona Fairplex; 1101 W. McKinley Avenue; Pomona, CA; Info: ReptileSuperShow.com

Jan 17-18: Orlando, FL; Repticon; Central Florida Fairgrounds; 4603 W Colonial Dr, Orlando, FL; Info: Repticon.com

March

Mar. 27-28 Gettysburg, Pa ; Gettysburg Reptile Expo; Allstar Events Complex, 2638 Emmitsburg Rd; Info: <https://gettysburgreptilexpollc.com>

April

April 11-12: Atlanta, GA; Repticon; Gwinnett County Fairground; Entertainment Building & Expo Center; 2405 Sugarloaf Parkway, Lawrenceville, GA; Info: Repticon.com

May

May 30-31: Orlando, FL; Repticon; Central Florida Fairgrounds; 4603 W Colonial Dr. Orlando, FL; Info: Repticon.com

July

July 11-12: Los Angeles, CA; LA Pet Fair; Pomona Fairplex; 1101 W. McKinley Avenue; Pomona, CA; Info: ReptileSuperShow.com

July 11-12: Atlanta, GA; Repticon; Gwinnett County Fairground; Entertainment Building & Expo Center; 2405 Sugarloaf Parkway, Lawrenceville, GA; Info: Repticon.com

July 25-26: Orlando, FL; Repticon; Central Florida Fairgrounds; 4603 W Colonial Dr, Orlando, FL; Info: Repticon.com

September

Sept. 13-14: Anaheim, CA; Reptile Super Show; Anaheim Convention Center; 800 West Katella Avenue, Anaheim, CA; Info: ReptileSuperShow.com

October

Oct. 17-18: Atlanta, GA; Repticon; Gwinnett County Fairground; Entertainment Building & Expo Center; 2405 Sugarloaf Parkway, Lawrenceville, GA; Info: Repticon.com

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