

NTS NEWSLETTER

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(VERNAL) POOL PARTY

BY CARLY CLARK

The groundhog may have seen its shadow, but that doesn't mean it's too early to start thinking about springtime! While out and about in the coming months, you may start to notice low-lying areas in the woods beginning to fill with water. Although they are trivial in appearance, these shallow depressions are called vernal pools and are wetland microcosms akin to nature's biggest pool party. Teeming with amphibians and invertebrates, these pools serve an important ecosystem function as the breeding ground for amphibian species of all varieties. This can be attributed to the pools' lack of fish predators due to their seasonality. However, like many biodiversity hotspots, this habitat type is extremely threatened. The main contributor is human infrastructure, but vernal pools are extremely difficult to include in land conservation strategies due to their seasonal nature. The unfortunate consequence of this is that many of the amphibians that rely on these pools are also of endangered or threatened status. Here are a few threatened and endangered amphibians to be on the lookout for in Illinois this spring!



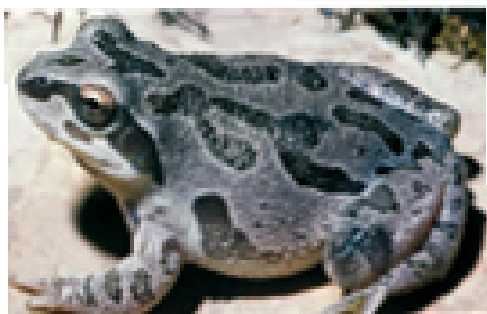
Jefferson Salamander

This threatened salamander species inhabits the upland forests of eastern Illinois. One of the first amphibian species to make an appearance at the end of winter, this species usually emerges from their underground hibernation spots below the frost line and migrate towards the nearby formed pools to breed. Very little is known regarding the life span of this species, but evidence suggests they can live 10 years or longer in a captive setting.



Silvery Salamander

Very similar to the Jefferson salamander above, this species of endangered salamander is difficult to distinguish without genetic testing. However, what sets them apart is the practice of kleptogenesis where females "steal" sperm from the male without utilizing the male genetic information, effectively forming an all-female population.



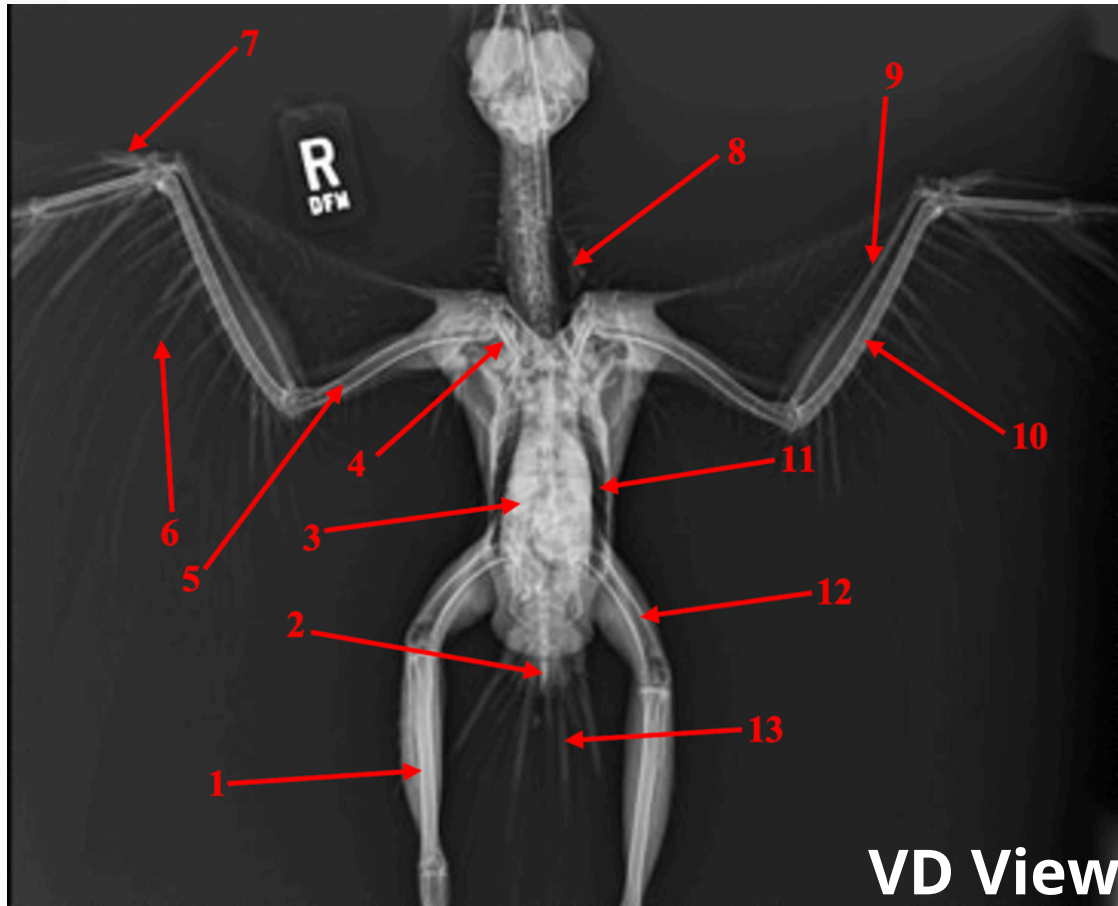
Illinois Chorus Song

This frog species is found in the sandy soils of wetlands in parts of Illinois, Missouri, and Arkansas. Using their bulky front legs to burrow through the sand and melt, this stubby frog species is another amphibian that can be found in late winter and early spring. Up for consideration for federal protection, it is becoming less and less common to see or hear this species in the wild.

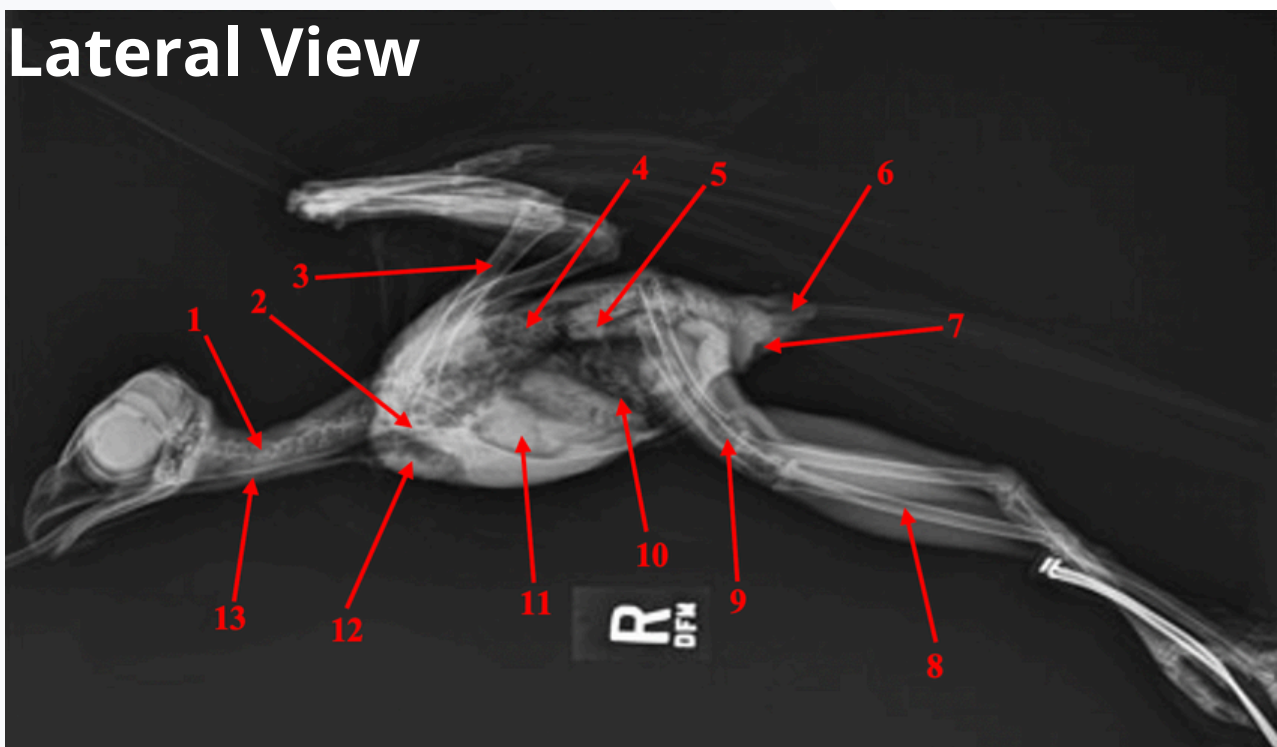
AVIAN IMAGING ANATOMY

BY RACHEL ANGLES

Radiology can help us diagnose a wide variety of diseases in our avian patients! In order to recognize what is abnormal, it's beneficial to have a good understanding of normal avian anatomy on a radiograph. Can you label the **26 structures** below?



Lateral View



Answers: VD View

1. Tibiotarsus
2. Pygostyle
3. Cardio-hepatic silhouette
4. Clavicle
5. Humerus
6. Remiges
7. Alula
8. Crop
9. Radius
10. Ulna
11. Lung
12. Femur
13. Rectrices

Answers: Lateral View

1. Cervical vertebrae
2. Coracoid
3. Humerus
4. Lungs
5. Cranial division of the kidney
6. Pygostyle
7. Cloaca
8. Tibiotarsus
9. Femur
10. GI Tract
11. Heart
12. Crop
13. Trachea

MATCH THE TPR & BODY WEIGHT TO EACH OF THESE COMPANION ZOO ANIMALS

BY KAYLA LADEZ

To learn more about vital signs in other species, check out Dr. Proença on Instagram @the_vetahead and Lafeber at <https://lafeber.com/vet/monitoring-vital-signs-in-exotic-animal-species/>



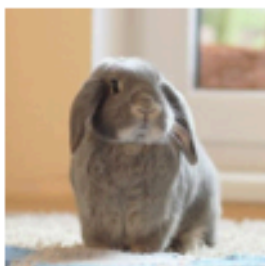
1

- Temperature: 104-111F
- Respiratory rate: 40-50 bpm
- Heart rate: 206 bpm
- Body weight: 80-100g



2

- Temperature: 100-104F
- Respiratory rate: 30-60 bpm
- Heart rate: 130-325 bpm
- Body weight: 2-6 kg



3

- Temperature: 100-104F
- Respiratory rate: 33-36 bpm
- Heart rate: 200-400 bpm
- Body weight: 0.8-1.2 kg



4

- Temperature: 94.8-100.2F
- Respiratory rate: 40-80 bpm
- Heart rate: 200-240 bpm
- Body weight: 450-900 g



5

- Temperature: 99-103.1F
- Respiratory rate: 35-135 bpm
- Heart rate: 230-380 bpm
- Body weight: 700-1200g

Answers: Cockatiel – 1, Rabbit – 2, Chinchilla – 4, Guinea pig – 5, Ferret – 3

PINK RATTLESNAKES

BY BROOKE DUGAN

Aruba Island rattlesnakes (*Crotalus unicolor*) are one of the rarest rattlesnakes in the world and are only found in the rocky scrub and desert habitats on the southern half of the island. They tend to stay relatively small, averaging just under feet. Their scales are a pale tan or brown and a dusty pink color with pale diamond-shaped markings down their back. During warmer months, they tend to be more nocturnal, but for the rest of the year, they're more active during the early morning and late afternoon to hunt small mammals, birds, and lizards.

Because of their small range, they're at great risk of habitat destruction and human development. It's estimated that only about 25 square kilometers of their range is undeveloped land. Despite their venom being life threatening and increasing risk of human interaction, Aruba Island rattlesnakes aren't typically considered "dangerous" due to their relatively non-aggressive disposition. The chances of someone encountering one of these snakes in the wild accidentally isn't likely, though. There are only about 230 individuals left in the wild, and the IUCN only recently had enough data to classify them as critically endangered in 2021.

The Association of Zoos & Aquariums (AZA) initiated the Aruba Island Species Survival Plan (SSP) in 1982, making it the longest functioning conservation effort of any snake. This endeavor began with 6 captive individuals, and over the course of 30 years and multiple shipments, an additional 27 individuals were imported from Aruban to improve genetic diversity. As of 2015, the captive population has grown to 95, with 60 housed at institutions in the United States. However, there have been difficulties getting the captive born rattlesnakes to reproduce. Some of the efforts made to improve reproductive rates have included providing larger enclosures with additional cage furniture as well as feeding less frequently and encouraging physical activity by leaving scent trails when feeding.



While the captive population has been inconsistently successful, the best chance the Aruba Island rattlesnake has is with local protection and conservation efforts. The AZA has helped fund research and education in Aruba. As a result, a large portion of their habitat has been protected, and in 2008, a wildlife symposium held by the First National Congress for the Preservation of Aruba Wildlife, created a plan to achieve conservation goals for Aruba wildlife. With time, education, and local efforts, the Aruba Island rattlesnake and other at risk species have a good chance of survival and stability.

TURTLES NEED ENRICHMENT TOO

BY FAYTH KIM

Turtles, like other animals, can benefit from providing them enrichment. It is a common misconception that turtles are sedentary creatures that do not frequently interact with their surroundings. Many captive turtles show curiosity to change, moving to investigate, and even displaying social personalities with their owners during interactions. Here are some enrichment ideas that could help stimulate turtles and tortoises with experiences, colors, tactile textures, etc., and can ultimately, help improve their quality of life.



Food:

- Switch up and rotate your feeder insects – This is recommended for your turtle in order to retain a nutritionally-balanced diet as insects differ in fat, protein, moisture, and calcium/phosphorus ratios. While freeze-dried bugs are convenient to feed, offering live prey will offer the animal an opportunity to hunt, mimicking more natural behaviors. *Ensure that the feeder insects have been previously gut-loaded to maximize nutritional benefits
- Encourage foraging behavior– This could be in the form of dispersing food throughout the enclosure, utilizing a toy treat dispenser, or even making “tacos” with leafy greens filled with some tasty treats.
- Colors – many turtles are attracted to colors red and orange. Offering a small, appropriately-sized treat of a bell pepper, carrot, cherry tomato, watermelon, etc. can motivate many turtles be more active and interested in their environments.

Environment:

- Natural plants can be great options to incorporate if able to. Live plants may also aid in filtering (especially ammonias and nitrates) and oxygenating the water. Research to make sure that they would be safe if your pet were to consume them. Some examples for freshwater enclosures include hornwort, java moss, java fern, and anacharis or waterweed. Some examples for tortoises may be Bermuda grass, spineless prickly pear cactus, clover, and even pansies as many enjoy munching on the flowers.
- If the turtle species is known to dig or burrow, offering a space with safe substrate (in case accidentally ingested) can allow for this natural behavior. The added benefit of being able to dig may be access to different humidity levels in the enclosure too.
- Diversify the substrate levels to allow some variation when possible (more applicable for terrestrial species). The bottom of the enclosure does not need to lay completely flat but can have some dips and elevation to make exploring more interesting.

Experiences:

- While UVB and heat lamps are great and appropriate for maintaining adequate indoor conditions, nothing beats the natural sun for your turtles on a nice day. Ensure that your turtle does not come in contact with pesticide-laden grass or plants, and that they are supervised if allowed to free roam!

LET'S TALK ABOUT IT: COMPETES 2022 ACT

BY SIOBHAN MEADOWS

Have you heard about the America COMPETES 2022 Act and the proposed amendments to the Lacey Act that's passed the House and will be reviewed by the Senate? You may have some questions, so Dr. William Sander has some answers. Learn about this proposed legislature, and let's talk about it.

What is the Lacey Act?

The Lacey Act was the first federal law passed to protect wildlife in the US and was passed in 1900. It covers a wide range of species - everything non-traditional that you might think of. Typically, it's to protect any species covered by CITES. CITES is an international agreement for endangered species, wild flora, and fauna. It's a broad mandate and includes anything that's taken, possessed, transported, or sold in the US. Like everything in the US government, it's not just enforced by one agency. The Department of Interior enforces it (US Fish and Wildlife Service), the Department of Commerce which does marine transport and more, and the USDA with their Animal Plant Health Inspection Service.

What are some things that fall under this act?

You can't transport or hold any of these types of endangered species or wildlife that are listed. You can't sell them or move them around without getting proper permits from Fish and Wildlife or USDA.

What are some of the previous amendments?

The Lacey Act has been amended four times, the biggest being in 1969. They expanded it to include lower vertebrates and invertebrates and increased the fines. Then 1981 and 1988 were two sets of amendments to strengthen the language so that it was easier to prove in a court of law. Fines were also increased and included up to 3 or 4 years in prison and the payment of \$20,000. It was then further expanded to cover big cat species in 2014.

What role does it play in importation currently?

Right now, it's a pretty strong act. With all laws that are passed it's really about the enforcement aspect. As most students are aware, there is a lot of black market and behind-the-scenes illegal trade that happens. The illegal pet industry is huge globally, and the US is one of the biggest importers of illegal pets while a lot of the Southeast Asian countries are the biggest exporters of illegal pets, so it's really challenging for the staffing at USDA and Fish and Wildlife to catch what's going on. I think overall the biggest challenge is enforcement and that there's not enough money being put towards it, and there hasn't been a big enough risk from these animals coming in. In general, we haven't had a major imported animal disease outbreak, so the US hasn't been motivated to put money towards it.

What are the amendments being proposed now and what do they mean for the Lacey Act?

These amendments that are kind of snuck in are under the COMPETES act. It's an acronym, but it's basically trying to make America competitive on the global market. Basically, what it says is that within the shipment clause of the Lacey Act, if a species isn't officially approved on a "whitelist" then that species could be considered injurious and not be allowed to be brought into this country or potentially move between states.

Would this mean it's "banned until it's on the whitelist" or it's "accepted until it's banned"?

More of the former, it seems like with the language - it must be "opted-in" for you to have that species, assuming everything's okay. Some of this is up in the air.

When reading it, my impression had been that the changes were allowing for emergency bans so if they had concerns about a species coming in then the Secretary of Interior could put a ban on it. That isn't the case?

I think that power is more for animals that are on the whitelist. I interpreted it as if a species suddenly becomes a concern for whatever reason the Secretary of Interior could ban it for up to three years. One of the problems I'll say for all legislation is that it's usually not very specific. Almost any law that's passed is like that and the idea is to try to get a strong enough mandate so that the executive branch agencies like USDA and Fish and Wildlife can then go forward and make rules within the confines of the legislation. Congress recognizes that they are not subject matter experts, and they can't define every little detail. So I think some of this is up in the air.

Would this apply to imported animals only, or could this apply to animals that are here already?

It sounds like it also applies to animals that are already here. I think there is some wiggle room so the Department of Interior may grandfather in species. They may say that if it's already in this country and it's safe and that could be proven then it's fine. Because it's the federal government, it only applies to animals that move between the states, so if that animal stays in one state, the federal government doesn't have any oversight over that. It's really around commerce and the shipping and movement of animals so it's a states' problem, and not necessarily a federal government problem.

Can you speculate on where this is coming from and why it's being brought up?

I think there might be some concerns from certain districts in the US about how invasive species and other animals may cause harm and so they feel like this is a way to bring this up. I also think this plays a little bit into the scare from COVID-19 and this idea that these animals are potential harbingers of emerging diseases that could affect us as well, so why not make it even more stringent for those animals coming into our country.

What are some pros and cons that you foresee would come from an amendment like this?

The pros are that there are a lot of species that are brought into this country that shouldn't be, and we do have a huge invasive species issue in natural environments from animals that have been released, so I think it could potentially provide more strength for enforcement for USDA and Fish and Wildlife. I think the biggest con is the whitelist idea - this opting-in piece. It's going to require a lot of energy and resources to get species onto that whitelist, and some of these species and special interest groups won't have the resources to push that through. It could mean that we lose out on some of the typical exotic species that we have as pets or elsewhere.

Can you speculate on how they would determine a species to be "injurious", for example, what would be some criteria?

I think that's a big piece of the unknown, so it's likely to be something that's going to mostly be determined by the Department of Interior. Will it be based on actual injury or the fact that they are not adapted to being in this space and shouldn't be here for whatever reason and therefore are injurious to native wildlife if they're released? It's unclear to me if it's injurious to humans or other species that are native, and what are the criteria.

How could this affect current exotic pet owners? Say they have one of the animals that are deemed to be banned, what are they able to do?

If you as an individual have an exotic pet that's not on the whitelist it's likely only going to be an issue if you're moving from one state to another, and even then, I don't think they're going to stop you. I don't think there's going to be funds or the desire to do that, but I do think it's potentially going to affect larger items around pet stores. We all know that exotic pets are generally distributed from distribution centers to various pet stores across state lines, so it can certainly affect supply chains.

Could pet owners potentially be told that they have to get rid of their animals?

I think that's going to be really challenging for that to ever happen. There's no registry. There isn't even a good national registry for cats and dogs, so I think the chances of that ever coming to fruition are next to zero.

Could this potentially impact zoos and aquariums, like in exhibit acquisition or animal movement for example?

I don't know that it would. AZA-accredited institutions have fairly stringent pre-shipment requirements anyway. They're already getting permits from USDA and Fish and Wildlife, so I don't think this would affect those institutions at least.

What are potential consequences for veterinarians if they're treating an animal that's technically banned and someone reports it?

That will depend on the state because every state enforces the Veterinary Practice Act differently. Certainly, if an animal that is on the banned list comes in and injures you, you'll have to report that to the authorities, whether it's the health department or somebody else. That's the only time it would be flagged. Then you might be subject to a fine or disciplinary action on your license potentially, but it really depends on the state for how much they want to enforce that.

(continued on next page)



How can veterinary students and professionals keep up with legislature that specifically affects them or their clients?

That's where being part of organized veterinary medicine really comes into play. Being a part of AVMA and being part of your state medical association is really important because both of those groups typically keep very close track of legislation that is going to affect their practitioners. AVMA has great resources with their governmental relations division that keeps track of federal legislation, and they also have a group that keeps track of state legislation across all states that might involve veterinarians. If you want to get even more involved, the AVMA has its own political action committee and state medical associations have their own political action committees which collect money that can go to trying to fight or support different bills that would impact the veterinary profession.

As students, you can do awareness campaigns and make your fellow colleagues or faculty more aware of the situation. We have some pretty good pull as a college of veterinary medicine within our state because we are the only veterinary school in the state. You can always reach out to your own legislators, especially at the federal level to your House representative and Senator. Right now, this bill is going to go into reconciliation, so this is a good time to try and make your voice heard. It does add up so reaching out and contacting more people really matters, especially when it comes from a subject matter expert which you all are. Every representative and Senator has an email and phone number that you can contact them at.

In your opinion, what's the likelihood that this is going to get passed?

I think it's probably less than 5%. I think the Senate bill is so different from what this is and the smaller Senate bill that has the language of this Lacey Act is still sitting in committee in the Senate and it's not related to the Competes Act at all. I don't think the Senate has an appetite to have this included and they've been the log-jam for the past few years. I think a modified bill might come out of this, but it's not going to include the Lacey Act. But never say never!

Want to get involved or keep up to date with the latest legislature that could impact veterinary medicine? Here are some great links Dr. Sander has provided:

National legislation that affects veterinarians and easy ways to get involved:

<https://www.avma.org/advocacy/national-advocacy>

State legislation that affects veterinarians: <https://www.avma.org/advocacy/state-and-local-advocacy/state-legislative-updates>

Find your Congress person: <https://www.congress.gov/members/find-your-member>

Sources and Acknowledgements

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