



Newsletter of the British Herpetological Society

Established 1947

# BHS AGM 2021

## Live from Chester Zoo



On the 8th May 2021, we held an afternoon live event online for our BHS Annual Meeting. This year we had the pleasure of Chester Zoo hosting and what an AGM it was. Dr Gerardo Garcia, Curator Lower Vertebrates and Invertebrates at Chester Zoo and our BHS president, gave an update on the amazing research being carried out by his team on the Bermuda skink conservation project. This research work has also involved a lot of behavioural work which was great to hear about.

The Bermuda Skink is classed as critically endangered with the main threats being habitat loss, fragmentation and pollution. Another threat are invasive species in-

cluding cats, chickens and rats. In light of these threats, an action plan to conserve the skinks was formed. Initially, a captive breeding programme was established with a wild founder group in 2015. The animals were sexed, quarantined for 6 months and then moved into a captive environment which matched their wild conditions. They were fed on a combination of insects, fruit, crayfish and processed diets. Sexing the skinks proved to be a difficult task but a combination of methods were established in order to do so. The males were highly aggressive so housing in groups was a difficulty especially if sexing was incorrect.



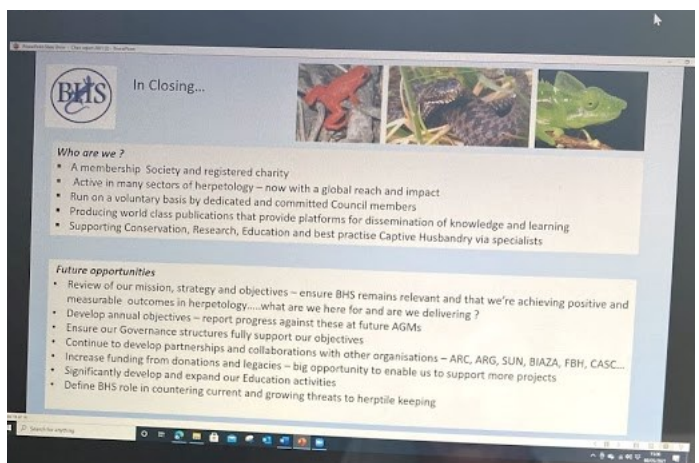
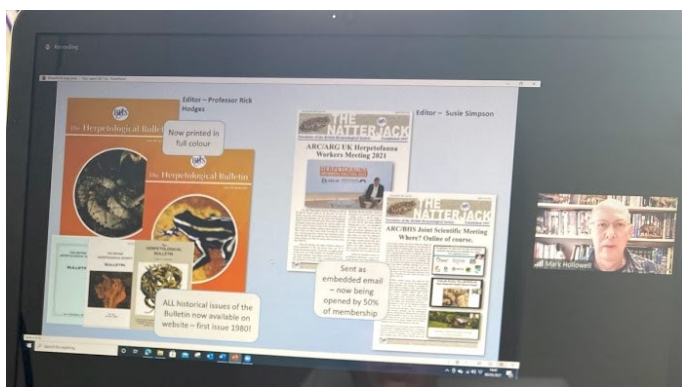
In 2018, the skinks moved into a custom built facility using a converted shipping container to ensure it was designed to be escape proof for the skinks. This was also easier to regulate the environmental parameters. Kieran Richardson (BSc Wildlife Conservation student at DICE) had seen on cameras that the skinks were entering Storm Petrel nests at night. Kieran carried out ethograms and monitored to try to establish why this behaviour was occurring. Other elements that were monitored were basking, feeding, breeding and courtship behaviours. Successful breeding occurred in 2017, 2019 and 2020 but there was no courtship observed and questions regarding parental care were queried. Carolyn Postlethwait (BSc Wildlife Conservation student at DICE) then started looking at the skinks courtship and mating behaviour more closely using camera footage building on what Kieran had observed. Between early February and mid-March, there were 5 successful mating's recorded of 5 pairs with some interesting behaviours exhibited. The next actions to be taken are to continue monitoring the wild populations and produce best practice guidelines with the future plan to have captive breeding and headstarting put in place. There is clearly a lot to be learnt about this species and the team have goals of researching diet, parental care and health

screening within their sights.

Mark Hollowell gave a big thank you to Chester Zoo and Liz Webb (Conservation Training Academy Manager at Chester Zoo) for hosting and organising. It was reported that with the online need for meetings, this has been very beneficial to the society council to meet more easily and discuss various topics in smaller focus groups. Here is a short summary of the work we have been carrying out at the society:

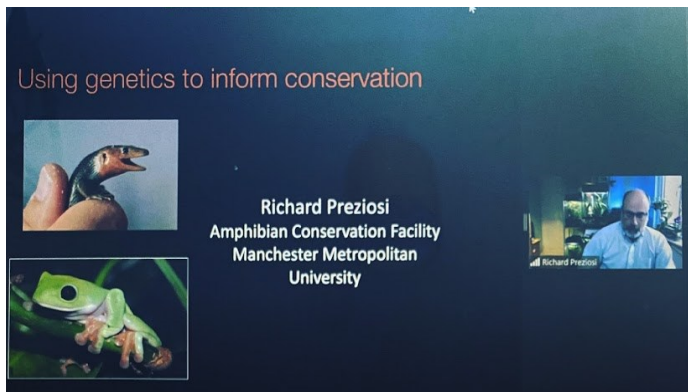
- We now have all of the historical publications online since 1980's and the website development is still ongoing.
- Our publications are continuing to prove to be popular and our presence on social media has increased with a global reach.
- £25,000 donation to ARC Trust to purchase Blackmoor woodland for conservation purposes.
- £10,000 ARC pledge for Parley Common heathland.
- We continue to support student research providing grants globally, not just in the UK and we have a new YouTube channel to link to our publication articles.
- The BHS Amphibian Ladder project work that Trevor Rose carries out has been very successful with over 2000 installed throughout the UK.
- We are very grateful to have received a legacy of £36,000 last year.

The next speaker we heard from was Professor Richard Preziosi from the Amphibian Conservation Society (Manchester Metropolitan University) who talked about the use of genetics in conservation. He started by talking about the research being carried out into the diet of the Bermuda Skinks. Out of 103 samples, 3 different sets of DNA were extracted. Tom Hughes carried out this diet



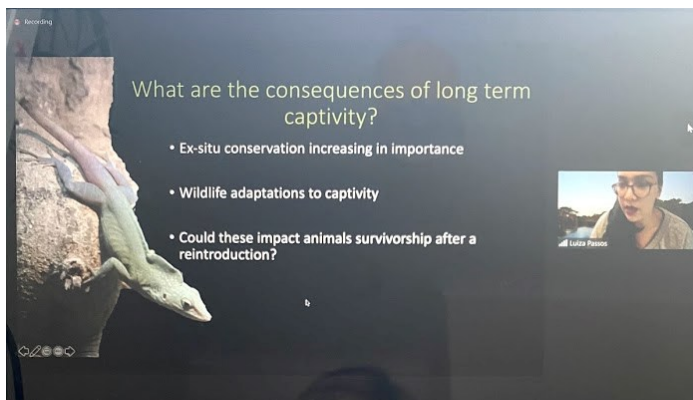


metabarcoding in the lab looking at the indirect and direct diet, the environmental contamination and the processing contamination. All of the samples had reptile DNA in addition to commonly found species such as



spiders, insects, ants and entomopathogenic fungi (this was probably from the ants diet). Minnow fish were also identified as well as cattle DNA which is assumed to be from the insects ingested having fed on manure. So going back to the skink nocturnal behaviour in Petrel nests, the samples showed some evidence that the skinks could be scavenging for food in the nests. This is a really interesting behaviour and the findings of this research into the diet is fascinating.

We also had the pleasure of Dr Luiza Passos joining us.



Luiza's talk was titled 'Keeping fit for the ark: are zoo bred reptiles and amphibians ready to go back to the wild?' based on her new publication and recent research on this topic. With the increase in captive breeding programmes, Luiza wanted to focus on the consequences of long term captivity and the effects on survivorship. If management of populations rely on reintroductions of captive bred animals, what are the effects of captivity and will these animals be able to be released successfully. She initially started looking at the effects on captive golden mantellas (*Mantella aurantiaca*). This involved considering the skin microbiota, tonic mobility, coloration and their calls. There are several considerations regarding differences between captive and wild environ-

ments. Including the captive tanks being cleaner than a forest floor and they would be isolated from other species unlike wild situations where an ecosystem is full of organisms and interactions. The wild animals will have a fear response when coming into contact with humans. Luiza talks about lower body condition with fear response relating to stress (tonic immobility) and behavioural changes and coloration for signalling and defence mechanisms. Coloration can also be affected by captive UV provisions and this may be an issue if the animals are released displaying the wrong colours in the wild i.e. they can be seen more easily by predators lowering chances of survival. She found that the calls were different in the Chester Zoo captive animals but there were still similarities. With the length of time in captivity being longer, more changes are likely to occur causing issues for males and females recognising mating calls.

In the second stage, Luiza looked at whether wild Jamaican anoles (*Anolis garmani*) adapt to captivity. She was able to collect data on a monthly basis to monitor progress. Faecal samples were collected to analyse looking at stress levels using corticosterone metabolite levels. Initially, the animals were very stressed during the first month at Chester Zoo but this lowered over 5 months. At 6 months, the anoles were showing the same stress levels as wild individuals. Correlations with stress and latency were seen 5-6 months in. Other correlations were seen in a brighter dewlap and stronger bite force.

The third stage was the rewilding of the golden mantellas. Luiza used 3D printed frog replicas with a range of colours from yellow through to orange and red with varying shades. Calls were linked to colours and female preference and male aggression was also seen with coloration. Luiza is also looking at environmental noise in captive settings with the view to have species specific protocols put in place for captive breeding programmes in the future management.

An incredible set of talks in one afternoon and well worth the wait. Although everyone is hoping to return to face to face meetings and conferences, this was a great example of how easy it is to join online talks and engage in learning about the current research being carried out. We had a large number of people attend the event and the feedback that followed was very positive and clearly enjoyed by all. We look forward to the next 12 months and the activities we can take part in as a society. Watch out for the announcement regarding next years AGM!

Written by Suzie Simpson

# Investigating stowaway amphibians and reptiles using news reports

Written by Steve Allain



I'm sure you've all seen the sensationalist news headlines of a retail consumer finding a newt in their salad. I've always considered these people lucky as I've never been the recipient of one of these stowaways that manages to slip through the cracks. However, headlines like this got my colleague and myself thinking, how widespread are such stowaways and are there any differences in the number of stowaway amphibians and reptiles, depending on the different source. Consumer goods such as groceries are one such way for stowaways to enter the country but so are commercial shipping crates and florist distribution networks. In order to answer our questions, we scoured the internet and newspaper archives for any stories on stowaway or hitchhikers of the herpetological kind, in order to determine where they came from and what species they were. We were only interested in those species that entered Great Britain, in order to restrict the geographical area for such reports, and to keep things simple.

So what did we find? The countries with the most stowa-

ways arriving in their goods were Spain and the United States of America. This isn't surprising given that holidaymakers were the largest reported entry point for stowaways. How many times have you been in your hotel and left a suitcase open on the floor? It's a perfect entry point for a gecko or another lizard to enter your bag and take a trip back home with you. Retail was the second biggest group which may be why so many of us remember seeing news reports like those I described earlier, or wonder if we'll win the lucky dip the next time we're down the veg aisle in the supermarket. The most interesting finding to me was that the number of records were not the same each year. This is likely due to the archiving of online news materials after it reaches a certain age, due to it no longer being relevant or it taking up too much server space. If you want to know more about our methods and our results, you can find the article we published in the *Herpetological Bulletin* [here](#).

Photos by Chris Newman (National Centre for Reptile Welfare)

# Let's hear it from the students

## 'Postgrad in Covid times'

Written by Becky Turner



I'm Becky Turner - I started my PhD at the UK Centre for Ecology & Hydrology with the University of Kent in October 2020. Starting a PhD in a pandemic is something that I definitely never anticipated! Though I feel somewhat lucky that something like this happened in an age where technology allows more-or-less any task to be performed 'remotely'. As my project was designed as an entirely desk-based operation, I have been able to get started with actually very little impact; though I know that this makes me one of the lucky ones. Although the direct impact of the COVID-19 pandemic on the logistics and design of the project that I'm working on has not been severe, there are a few nuances to doing a PhD that I imagine I'm experiencing differently to a standard PhD experience (which I'm told actually doesn't exist anyway but that's another story!). For instance, face-to-face meetings are conducted via a webcam, training workshops and conferences have all been online affairs, 'virtual tea breaks' have replaced 'chats in the corridor' and I have no idea what 'the office' looks like. However, the biggest nuance that springs to mind is that I have never met my project supervisors face-to-face! At every stage so far, from interviewing for the project to getting set up and running project management group meetings, all contact with my supervisors has been done virtually. Although this is strange, there have been some positives. Like many first-year PhD students, I find meetings quite a nerve-wracking experience even though my supervi-

sors are incredibly encouraging and supportive. As a 'newbie' to the research field, it's important to make good first-impressions and I needed to quickly overcome the sense of feeling in complete awe when liaising with successful academics, whom I look up to, and try to appear somewhat professional! Though, I felt I was able to take advantage of being sat behind a desk talking to a computer screen to help me do this. I can have various hidden notes easily accessible to help me to refer to, and I can hide my shaking hands and sweaty palms better than in face-to-face scenarios! This has meant that I am able to develop some confidence and feel a bit more equipped for meetings than perhaps I would have done face-to-face. Although this has helped get initial anxieties under control, I'm definitely looking forward to meeting my supervisors at some point in 2021 and start having a more 'normal' PhD experience, whatever that means! The project I'm working on is a NERC ARIES-funded project. I'll be modelling population trends of UK reptile and amphibians using citizen science data and working closely with the Amphibian and Reptile Conservation Trust, Amphibian & Reptile Groups UK, and the British Trust for Ornithology. Feel free to follow me on twitter (@bexturner) to keep in the loop with the project!

**Check out the next issue to hear more about our post-grad student experiences during Covid times.**



# How to set up heating, lighting, and UVb for bearded dragons (*Pogona vitticeps*) in a 4'x 2'x 2' vivarium (Part one)

By Ben Van Nest and Chris Phillips



## Introduction

With bearded dragons (*P. Vitticeps*) being one of the most popular pet lizards, it's no surprise we have so many needing help with basic lighting and heating setup. In an effort to streamline those answers, here is a generic "one size fits all" explanation for the standard 4'x2'x2' enclosure.

All reptiles rely on sunlight and the energy it carries in one form or another. This can be broken down to the Ultraviolet portion, the Visible Light portion, and the Infrared portion of the spectrum. When considering lighting, we must try to focus on recreating the entirety of the sun's spectrum and providing it in sufficient and safe intensities. With the current technology available, the best practice is to use several lamps with specific spectra to thoughtfully provide the necessary wavelengths. This can be simplified to a minimum of 3 lamps, although keepers may find these still lacking in sufficient Visible Light. Adventurous keepers may seek to experiment with additional numbers and types of lamps to create a more intense yet balanced spectrum. Do not expect to get it correct the first time! Every setup is unique and may take experimentation to get it where you need it.

## Infrared Light

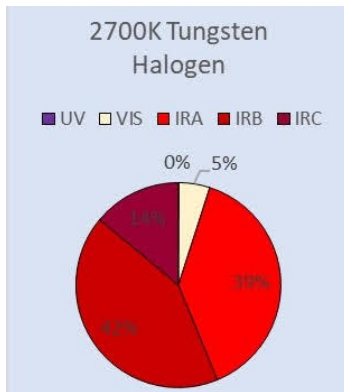
The Infrared portion of sunlight can be broken down to Near Infrared (IR-A) and Midrange Infrared (IR-B). The wavelengths are provided in a fairly even ratio to each other, and both wavelength groups have the property of being able to penetrate deeper into the dermis of the basking reptile. This useable Infrared is what's being utilized by sun basking reptiles directly, but this Infrared is also responsible for warming the ground, rocks, stones, etc.; where reptiles can also absorb

the captured energy through conduction and convection. As the various objects and surfaces warm from the sunlight, they begin to re-radiate excess energy at longer wavelengths as Far Infrared (IR-C). This IR-C radiation warms the surrounding air through convection. IR-C is also captured by our reptiles by direct contact, belly basking, ie conduction but IR -C is less able to penetrate the dermis as deeply as IR-A/B.

For basking lamps, a simple household incandescent or halogen bulb such as from the hardware store or even Amazon, should be sufficient. Incandescent lamps can be identified by an easily seen coil filament in the lamp; these are best served for flood lamp purposes. Halogens can be identified by the little capsule within the lamp that houses the filament; these are best used for spot lamp applications. All incandescent and halogen lamps produce some Visible Light, a good ratio of IR-A and IR-B, as well as some IR-C. These are the closest lamps we have to replicating the ratio of useable Infrared that we see in sunlight. Basking lamps should be white like sunlight; do not use coloured bulbs!

There are several types and shapes of bulbs that can all do the same thing more or less; some will do a better job than others. The most recommended for bearded dragon keepers are the Par30 or Par38 halogen flood bulbs. 'Par' stands for Parabolic Aluminized Reflector; the number refers to the bulb face in 8ths of an inch. So, a Par38 has a bulb face with a diameter of 38/8ths of an inch or 4.75". 'Flood' refers to a beam spread of typically 25° or greater. SP=Spot 10°, FL25=Flood 25° beam spread, FL30 = Flood 30° beam spread, etc.

For keepers who may not need a high intensity, the BR30 flood style bulbs may be a good alternative. Owing to the design of the lamp, the light is spread over a



### Determining Basking Lamps

Wattage needed will depend on a variety of factors, so it is difficult to give a specific recommendation. At the end of the day, you're looking for something that creates an evenly heated area as large as the dragon from snout to tail. Many keepers will opt for 2 or 3 lower wattage lamps in a cluster to help achieve that large, evenly heated basking area. The challenge with many "reptile" branded lamps is they tend to have a spotlight beam shape, which tends to create a hot spot in the centre. Hot spots should be avoided because the animal can risk getting burned in that area while waiting for the rest of their body to come up to temperature. Therefore one or more flood bulbs is recommended, as they provide a more evenly heated area without hotspots.

When selecting a basking lamp, look for something that can be used at or near full power to achieve acceptable Infrared intensities. The use of a simple dimmer switch may be beneficial in helping dial in the basking intensity. However, severe dimming of the lamp long term is not ideal, as it lowers the Visible Light which is also desperately needed for basking. There are two main methods to use to measure the Infrared intensities, both should be used in conjunction with each other for most accurate results.

First method is to measure the surface temperature of the basking area with an Infrared Non-Contact Thermometer or "Temp Gun" to make sure the basking surface is within acceptable range (104-113F, 40-45C for Bearded Dragons). Do this after the lamps have been on for about 3+ hours to ensure the material has reached its highest temperature. The reason we measure the surface is because it's telling us the amount of Infrared produced by the lamps is sufficient to warm an object with greater mass to a higher temperature, so it's enough to warm the animal to their necessary internal temperature with a reasonable amount of time.

Second method is to simply place your hand over the basking area. You are looking for a gentle warmth on the back of your hand; something you could comfortably leave your hand in for several minutes. If it's too hot, intense, or otherwise uncomfortable, then the Infrared is too intense. In that event the lamp needs to be adjusted by either changing the wattage, dimming, or increasing the distance from the lamp to the surface if possible. If you feel no warmth, you may need to increase those same variables.

wider area. This results in less Infrared intensity at a given distance when compared to an equal wattage Par Halogen. This may be a suitable option for keepers with internally mounted lighting and/or less distance between basking lamp and dragon.

### Ultraviolet Light

Now that we have covered the Infrared portion of the spectrum, we'll look to UVb. Just as with basking lamps, we want to ensure the entirety of the dragon is covered with UVb lighting. To give dragons an adequate "dose" of UVb T5HO lamps are recommended. The older T8 style are insufficient for the distances inside a 4'x2'x2' as well as over a screen. T8 lamps need to be used at much closer distances and cover most of the enclosure. This is where the "2/3 to 3/4 rule" stems from, however this "rule" is now outdated and need be forgotten. The old concept of 2/3rds of the enclosure being washed with UVB lighting is no longer the desirable. We want to give the dragon the opportunity to display behaviours that they would in the wild and this includes moving from sunny areas to shady areas and warm areas to cooler areas. The goal is to provide them the choice to bask or not. We don't necessarily want to force them to be under the UVb lighting all day long for 10 to 12 hours. Just like in the wild they will move into the sunshine when they feel necessary and then they will go and seek out shade and other areas retreating from the sunshine. This is called photo regulating and thermo regulating.

Currently we have newer technology available in the T5-HO fluorescent lamp. Owing to their increased wattage, electronic high-frequency ballasts and better designed reflectors, the T5's can produce UV indices rivalling midday sun. This allows the provision of higher UVi at safer distances. Due to the increased efficiency, the T5's should be as long as the animal from head to tail and ideally no more than 1/2 the length of the enclosure. This ensures an adequate exposure in the basking site and creates a gradual gradient down to 0 UVi in the shade. For Bearded Dragons the 24watt T5HO should be sufficient for their needs (24" fixture 22" bulb). As far as which strength lamp, that depends on a couple factors.

UVb is so vital to beardie health that these lamps should not be skimmed on. It is recommended to stick to known and tested brands of lamps such as Arcadia and ZooMed Reptisun. It should be noted that both the Arcadia and Reptisun brand T5 lamps have almost identical output; the real difference comes from the reflector used in the fixture. The Arcadia ProT5 fixtures are currently the best, boosting the base UVi of the lamp by 3. There is a similar fixture created by Reptile Basics, the VE-T5HO, that are identical in output to the Arcadia. Other brands such as the Reptisun, Sunblaster, or generic fixtures are not as efficient and will result in a lower UVi at a given distance. These fixtures can certainly be used, but the distances may need to be re-evaluated for accurate exposure. Reptile Lighting recommends the Arcadia or VE fixtures for the sake of ease and consistency with estimating results; plus they can be daisy chained together! This daisy chain ability also allows for the expansion of the lighting system, such as including T5 daylight fluorescent lamps or the complimentary Jungle Dawn LED bar.

**Check out the next NatterJack issue for Part 2!**



# Have you seen turtles in the UK?



Take part in our research on the distribution of released pet turtles in UK waterbodies. Submit your sightings of turtles to our survey and find out more on our website: [www.turtletally.co.uk](http://www.turtletally.co.uk)

## Turtle Tally UK Citizen Science Project



Website: [www.turtletally.co.uk](http://www.turtletally.co.uk)

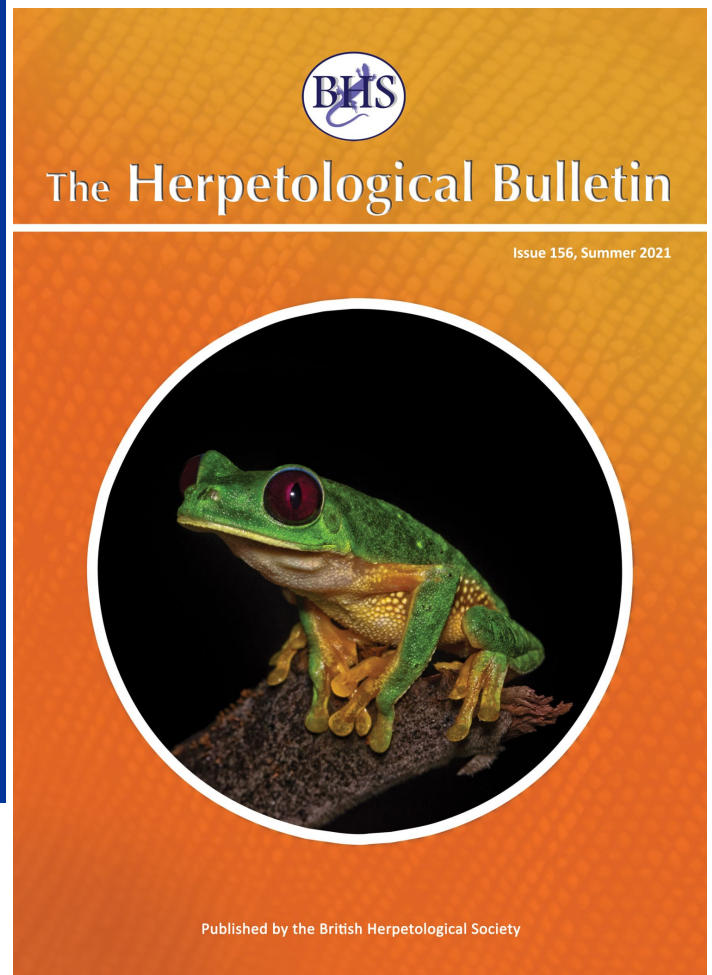
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To our BHS members,

We are always interested in hearing from you. Please feel free to contact me if you would like to share anything regarding herps. We would love to hear about your animals, your experiences, their care and husbandry, ideas, training, research and more.

It is important to us that you have that opportunity to share with the wider community, as we all benefit from sharing knowledge and experience.

Kind regards,

*Suzie Simpson*

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