

THE TIME FOR RESPONSIBLE HERPETOCULTURE EDUCATION IS NOW

Author(s): ***Philippe de Vosjoli**, Creator and Promoter of Herpetoculture as philosophy and discipline, one of the founders of the “Vivarium” magazine and American Federation of Herpetoculture (AFH), USA*

Reality check

As herpetoculturists who interact primarily with the circle of our like-minded peers, we tend to forget that most humans have no interest in amphibians and reptiles, have very limited knowledge about amphibians and reptiles, have misconceptions and fears about them, and/or no particular concern for their preservation. As a reality check, consider that current estimates are that roughly three percent of US households (about one in sixty people) keep some type of amphibian or reptile. These keepers likely influence and spread some level of awareness and information about reptiles and amphibians to at least an equal percentage of the population. Although this is not insignificant, and is a much greater number than several decades ago, it is still only a small minority of the general population.

Unfortunately, for many, a brief interest in amphibians and reptiles is often sparked by news stories, sensationalistic and often negative, usually about reptiles and particularly about snakes. These include incidents related to escapes, bites, and injuries, invasive species, ecological impacts (Burmese pythons, iguanas and tegus in Florida or introduced albino kingsnakes decimating the fauna of the Canary Islands) and in recent years by outlandish and attention seeking videos posted on YouTube.

For many members of government, the issues and problems associated with herpetoculture are more of an annoyance, considering the scale of sociopolitical and legislative/regulatory issues they have to contend with. In addition, there are political and ideological factions (radical animal welfare and rights groups and radical conservation groups) whose purpose is to fuel negative publicity and narrative about herpetoculture and animal keeping in general with the goal of promoting and supporting legislation so restrictive that the practice of animal/pet keeping declines dramatically or dies. Unfortunately, many in politics are influenced by the lobbying of these well-funded groups and adopt supportive positions they believe are politically correct. Countering this trend will only be possible with an educational movement prominent enough that those in charge will take notice.

The information is there but ONLY IF YOU LOOK FOR IT

With regards to amphibians, reptiles, and herpetoculture, there is now a wealth of information available (including a great deal of misinformation) on the worldwide web, various forums, social media groups, and specialized publications and books. But this information reaches primarily just the circle of peers I referred to earlier. It does not reach beyond the circle and into the general public, broad media, or members of government. A public relation and constraint of these media is that the information is there, but only IF YOU LOOK FOR IT, and the majority of people do not look for it ...because it is outside of their circle of activity, interests, and thoughts. Even among keepers and serious herpetoculturists, most will confine themselves to a narrow range of topics addressing specific issues or species that concern them and ignore the broader issues associated with reptile and amphibian keeping. For example, few reptile keepers will do a search on responsible herpetocultural practices. For the same reasons, most of the reptile keeping public

is relatively unaware of all the regulatory/legislative issues and proposals that could eventually affect their right to keep reptiles. In general, there is a mountain of information available but no synthesis of its contents to present a picture of the state or value of herpetoculture.

Let's consider one of the biggest problems associated with keeping reptiles as pets: the release of animals in the wild. Not only is releasing unwanted pets terrible PR for the hobby, it is also illegal and potentially harmful to native species if large numbers are released and the species manages to become established in the foreign habitat. The best example is the release of red-eared sliders by misguided pet keepers, which has been happening since the 1950s worldwide when their turtles grew large enough that they became space and labor intensive, and costly to house and maintain. The red-eared slider qualifies as the most invasive reptile on the planet, competing with and displacing native turtle species and disturbing ecologies. One would think that reptile keepers would be informed of the potentially negative impacts of releasing unwanted pets, but most are not because they are not faced with the information and because there is not enough effort from the pet trade to promote or require the dissemination of this essential rule of reptile keeping: Never release unwanted pets.

But even greater effort needs to be put on reaching the general public, the media, and indirectly those in charge of government to educate them about the positive aspects of Herpetoculture and how it benefits society and culture. We also need to toot our horns about our significant accomplishments: the development and accumulation of a massive base of knowledge on the husbandry, propagation, life histories and behaviors of hundreds of species of amphibians and reptiles, both by members of the private sector and zoological institutions, producing powerful tools for the future preservation of species. The educational reach needs to extend beyond our circle of peers and into large pet trade expos, schools, and a variety of forums, public events and outlets. Reptile and pet industry trade shows must be more than just about buying and selling but serve as a powerful vehicle for education of the general public and to draw enough attention that their educational emphasis appears on televised media. And yes, we also need to acknowledge and address the negative aspects of the reptile trade and reptile keeping and present solutions to rectify and prevent past patterns.

The Responsible Herpetoculture Educational Project

The big question we asked ourselves is how to implement and promote an educational program on herpetoculture. Our first step was to outline essential information and identify issues that needed to be addressed. We then developed a number of information sets/groups and investigated the various media for their presentation. These included the following:

1. A double large screen video presentation (costly to develop and implement in multiple locations) that would include a video program to be shown at various pet, trade and public events, schools, and other forums with a single screen version that could be sold and distributed to smaller venues e.g., for reptile and pet stores, educational programs, pet and wildlife events etc.
 2. Panels in the form of multiple pop-up banners to be set up at trade shows and other venues.
 3. Booklets to be distributed at various events and to government personnel addressing herpetocultural issues and regulations.
 4. Eventually, developing and producing a documentary.
- Very likely, depending on resources, we will implement all the above.

Currently, we have completed ten of the fifteen educational sets in the first version of the Responsible Herpetoculture Educational Project. These can be modified to address the needs of different countries or specific events. As examples of content, four sample sets and associated information panels for the Responsible Herpetoculture Educational Project are presented here. Only a limited number of associated images are shown.

SAMPLE SET 1: Why Reptiles and Amphibians?

Reptiles and amphibians have fascinated human beings since the dawn of humankind. Did you know?

The earliest evidence of a human religious ritual is a stone formation in South Africa in the shape of the head and front body of a giant python (Fig. 1). Over 13,000 stone spearheads and other tools used to ritually strike and chip the snake body were reliably dated to 70,000 years ago (Fig. 2).

Figure 1. Giant python stone formation, Tsodilo Hills, South Africa. Photo by Sheila Coulson / University of Oslo.

Figure 2. 70,000-year-old Spearheads associated with the giant python stone formation. Photo by Sheila Coulson/University of Oslo.

The snake is the most represented mythical symbol of rebirth (snake sheds its skin and is reborn anew), the cycle of existence, and creator of the world. The well-known symbol of the Ouroboros pictures a snake consuming itself as it regenerates itself, representing the cycle of life (Fig. 3).

Figure 3. Earliest known representation of the Ouroboros, Egypt, from the Tomb of Tutankhamun. Dated to 1400 BC, Egyptian Museum, Cairo.

The turtle is the second most widespread represented reptile of myths worldwide. A common myth was that the world rested on the back of a giant turtle.

The frog is one of the earliest creatures to be represented in Egyptian art (associated with the goddess Heget), with the earliest examples dating back more than 3,500 years. Globally the frog was a symbol of fertility.

Something about amphibians and reptiles, somewhat like us but not like us, perplexes the human mind. Like us they have eyes, most have limbs and are bilaterally symmetrical (the left side is a mirror image of the right.), yet they have scales, smooth skins, golden eyes and for those who have never seen them, seem otherworldly.

The fascination with amphibians and reptiles continues to this day with the growing interest in **Herpetoculture: The keeping and Breeding of Amphibians and Reptiles**

SAMPLE SET 2: The First Reptile Keepers

Archeological records indicate that more than three thousand years ago, ancient Egyptians may have kept and bred the Nile crocodile, a revered species with thousands of

mummified examples found in archeological sites. To meet the demand for thousands of juvenile crocodiles for mummification, it appears that Egyptians were the first to develop a form of herpetoculture

In the Egyptian city of Faiyum archeologists have determined two buildings served as a crocodile hatchery and nursery. Eggs were found buried deep in holes that were likely used for incubation.

How special were crocodiles? The Greek geographer Strabo describes, the special meal offered to Petsuchos, a sacred crocodile kept in Faiyum: *“The priests went up to it; some of them opened its mouth, another put the cake into it, then the meat, and afterwards poured down the honey and milk.”* (Fig. 4).

Figure 4. A special meal being offered to Petsuchos, a sacred crocodile kept in Faiyum.

Turtles and tortoises, because they will eat foods readily from gardens and local markets, have likely been kept for varying periods of time during human history, primarily as a source of food but also as revered species. Turtles generally have been seen as symbols of longevity.

But captive breeding of amphibians and reptiles is primarily a modern phenomenon. As with the keeping of tropical fish, there were great limitations to keeping of exotic amphibians and reptiles in zoos or private collections until the widespread availability of electricity, air travel, and commercially produced foods (e.g. rodents for snakes, insects for lizards and frogs).

Info Panel: Did you know? The ancestors of snakes had limbs

Boas and pythons are considered primitive snakes because they retain vestiges (a much reduced form) of the pelvis (hip bones) and hindlimbs of the ancestors of snakes. In boas and pythons, these ancestral features form the spurs found at the sides of the vent (anal and cloacal opening) and are used during courtship.

Recently a gene associated with limb development in snakes was identified and it was found that it turns off early in a snake’s embryonic development . When that gene was experimentally introduced in mice it produced mice with reduced limbs.

That the predecessors of modern snakes had limbs is supported by the fossil record showing that the predecessors of modern snakes had limbs for 70 million years before evolving into limbless species.

Absent or reduced limbs are also found in several species of lizards (burrowing skinks and legless lizards) and in caecilians, a family of the amphibians.

SAMPLE SET 3: How Herpetoculture Benefits Society and Culture

1 A Valuable and Powerful educational tool. Herpetoculture is an interdisciplinary field of knowledge, meaning you must educate yourself in several areas to be a good amphibian and reptile keeper

A tool for teaching biology, natural history and related fields When incorporated in educational systems herpetoculture can be a valuable tool for teaching biology, including taxonomy, herpetology, botany, evolution, ecology and genetics.

Naturalistic and mixed species vivariums can serve as introductions to a wide variety of ecological and environmental topics such as soil science, radiation, botany, ecology, water

chemistry, climate change etc. Herpetoculture can also serve as a tool for teaching animal behavior, and cognitive science.

2 Developmental and existential benefits.

Incorporating keeping reptiles and amphibians with exploration of nature can offer a wide range of developmental and existential benefits that include an introduction to the wonders of nature and incorporating nature in one's worldview. For many, exposure to reptiles, amphibians and their care will trigger positive emotions and a realization that sets the course for one's life and education as biologist, educator, conservation specialist or herpetoculturist.

Caring for other species can play an important role in the development of a range of empathy and an awareness of sentience in nature.

For many, it is an opportunity for bonding and sharing a passion with family and friends.

It can give a sense of grounding in a broader cosmological and evolutionary reality.

Like many things in life, set (parent's mindset and education, home environment) and setting are crucial factors in the benefits herpetoculture can provide.

3 Fill existential, social and community needs. Herpetoculture has generated a wide range of social structures such as reptile shows, conferences, societies, internet forums and social media groups. All of these can offer a range of psychological benefits to individuals, providing a venue for passion and purpose and opportunities for engagement, sharing, and providing for many a sense of belonging to a community.

Figure 5. Herpeton Conference 2019, 12 am in the hotel lobby and bar, attendees were still involved in conversations.

4 The creation of technologies, businesses, products and jobs to meet dietary, housing and care requirements for amphibians and reptiles. Many companies including the sponsors of this project have been instrumental to the popularity of keeping amphibians and reptiles. They developed and commercialized essential products including vitamin/mineral supplements, special lighting to provide heat and Ultraviolet B radiation required by many reptiles, heating pads and thermostatic controls, a variety of housing enclosures, landscape and enrichment products, misting systems, and more. To meet the dietary needs of amphibians and reptiles, live food producers offer a variety of insects and rodents. Diet manufacturers have also developed a variety of dry and gel diets that fill the nutritional needs of many of the most commonly kept species of lizards and turtles. As a result of supply and demand, the reptile industry has created thousands of jobs in manufacturing, distribution, and wholesale and retail sales. You just need to walk this event to see a small portion of the economics of herpetoculture

5. Herpetoculture builds a valuable body of knowledge and a tool that can be applied as a component of strategies to prevent species loss and preserve species diversity.

6 Herpetoculture can create reserve captive populations. With proper management and in cooperation with zoological institutions and conservation organizations, responsible herpetoculture can establish self-sustaining reserve populations of threatened species as a tool for conservation and a hedge to prevent extinction.

Info Panel: Reptiles and amphibians are among the most successful of the land vertebrates

Amphibians: 8000 species

Reptiles: More than 10,000 species

Mammal species: 6500

Bird species: 18,000. Note that birds are considered living descendants of the dinosaurs, ancient reptiles

SAMPLE SET 4: Ten Rules of Responsible Reptile and Amphibian Ownership

1. **Never release a captive amphibian or reptile in the wild.** This can harm native species. It could introduce disease. It is illegal and could impact the rights of all who want to keep amphibians and reptiles responsibly.
 2. **Keep your animals in secure caging.** Escaped animals often do not survive. If they are found outside your home in public, the incident can generate negative publicity that can impact our rights to keep amphibians and reptiles. In rare cases, multiple escapes could lead to the introduction of a nonnative species.
 3. **Be informed before you buy.** Always do your research before buying an amphibian or reptile. There are now many books, internet sites, social media groups, videos dedicate to the proper care of amphibians and reptiles.
 4. **Be aware of local and state regulations regarding the ownership of pets and reptiles.** Failing to do so could mean your pet(s) could one day be confiscated and you could be cited with a violation or charged with a misdemeanor.
 5. **Never take a reptile in a public setting outside of the proper forum.** Many people are afraid of animals they are unfamiliar with, including snakes or lizards. Because of this concern, taking certain reptiles, notably snakes out in public is illegal in many parts of the US. In the right forum such as an educational presentation of a reptile show, a snake, large lizard or crocodilian can help enlighten the public about reptiles and amphibians. In the wrong forum it can create an incident that makes the news and generates negative publicity for reptile and amphibian owners.
 6. **Do not support the enemies of pet ownership.** There are now several extreme animal right organizations that want to end the right to keep and breed amphibians and reptiles, such as PETA and the Humane Society of the United States, Inform yourselves of their position statements. Do not support these organizations but do support your local humane societies. Responsible reptile keepers support animal welfare and better-quality care, NOT a ban on the right of ownership.
 7. **Support and donate to USARK,** the US organization that represents the reptile keeping community and addresses and fights unsound legislation that threatens our field of endeavor.
 8. **Support and become a member of Responsible Herpetoculture,** an international organization that promotes responsible reptile keeping and the accomplishments of reptile and amphibian breeders.
 9. **Think and plan carefully before buying giant reptiles.** Although they may be the most responsive and intelligent of reptile pets, their requirements do not make them ideal for the great majority of prospective pet owners. The small easily housed baby python, green iguana, large monitor lizard or African spurred tortoise will require an enclosure at least the size of a small room to be housed properly. Giant reptiles are also expensive to heat and feed. They are fascinating pets for those who can care for them properly, but they are not for everyone.
 10. **Support conservation organizations.** The only way we can preserve species biodiversity of amphibians and reptiles is by protecting as much of their habitat as possible from further destruction. If you care about the preserving biodiversity, support organization that protect nature like The Nature Conservancy and the Rainforest Action Network.
- Adopt Basic Hygiene Practices.** All animals can harbor bacteria or parasites that can be transmitted to other animals in a collection or in rare cases to human members of a household.

Reptiles and Amphibians can be carriers of salmonella. They are not recommended pets for young children or for the immunocompromised.

Info Panel: Did You Know? Most snakes sold in the hobbyist/pet trade are captive-bred.

At least 100 species of snakes are now bred and established in captivity. Thanks to the breeding efforts at hobbyists and zoos, we now have a body of knowledge and a tool that could help preserve biodiversity.

Figure 6. A set of snake species well-established in herpetoculture. The photos are taken via the following links using Creative Commons licence:
[https://commons.wikimedia.org/wiki/File:Corn_Snake_large_gravid_female_\(without_watermark\).jpg](https://commons.wikimedia.org/wiki/File:Corn_Snake_large_gravid_female_(without_watermark).jpg);
https://commons.wikimedia.org/wiki/File:Boa_constrictor_coiled.jpg;
https://commons.wikimedia.org/wiki/File:Ball_python_lucy.JPG;
https://commons.wikimedia.org/wiki/File:Heterodon_nasicus.jpg;
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