

Responsible herping: A note on the ethics of reptile and amphibian interactions.

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Introduction

“Herping” is the act of searching for reptiles and amphibians, usually in a recreational manner, however, can also apply to scientific data collection in the field and any survey procedure directly seeking out herpetofauna. Unlike other wildlife-related activities such as birdwatching or safari, herping is often a hands-on activity, involving the capture and photography of the subject. Being hands-on with a subject is largely a more positive interaction, getting a closer look at the animal, taking more detailed and aesthetic pictures, and it is sometimes necessary if you intend to collect data on the individual. Despite this, being hands-on can introduce various negative impacts including stress for the animal, habitat destruction, and even disease. This raises several questions relating to the ethics, welfare, and responsibilities of herping, particularly on a recreational basis.

Herping is a somewhat “learn on the job” activity, the more time spent in the field, the more experience you get with handling different situations,

interactions, and ultimately get better at it. Most people are introduced via peers and therefore have some guidance regarding best practices when herping. There is also a thriving online community consisting of social media, forums, blogs, and videos. These can be invaluable in gaining insight into how others operate around wildlife, both in a recreational and research capacity. Most would agree it is desirable to learn from as many peers as possible, expanding your theoretical repertoire regarding the unwritten guidelines of herping, however the rise of social media has facilitated views from various areas, angles and egos, often contrasting in the way they approach the activity.

This article aims to bring some objectivity to responsible herping (and general wildlife interactions), hopefully facilitating some balance between respect for animals and the environment, while continuing to enjoy observing and photographing these animals in the wild.

The first thing to consider when herping is the aim

of your expedition. Whether you are collecting data on the herpetofauna of the area, answering a snake rescue call, or simply practicing your macro photography, know the reason why you are interacting with reptiles and amphibians, and adjust your responsibilities as appropriate. With a clear and concise goal in the back of your mind, you can assess what is necessary during your interaction; do you need to measure the animal, do you need to pose it for photos, do you even need to catch it?

Respect for the animal

It is not uncommon for herpers to preach about the ecological importance and conservation

issues regarding reptiles and amphibians, whilst simultaneously irresponsibly wrangling snakes for the perfect picture for social media. What kind of message does this send to people interested in learning about herpetofauna, and indeed other herpers? If we want herpetofauna to be endeared as much as large mammals (e.g. Tigers, Elephants), we need to start treating them less like objects and more like animals, demonstrating the beauty and nature of them in their natural environment (e.g. Figure 1 and Figure 2).

To consider the impact we have on the individual animal, we must explore what is important to the individual. Herpetofauna (mostly reptiles) are often



Figure 1. Multiple male European Adders (*Vipera berus*) basking outside a hibernaculum. From this in-situ photograph we can deduce proximity to a hibernaculum, sex, pre-slough condition, and kleptothermy.



Figure 2. Female Wagler's Pitviper (*Tropidolaemus wagleri*) photographed in-situ. A large individual, potentially gravid, and resting on a branch approximately 1.6m from the ground. No handling was needed for photography and observation.

encountered while basking. They may be easier to catch if they have not warmed up, and sometimes prioritise thermoregulation over predator avoidance (e.g . Herczeg *et al.*, 2008; Webb *et al.*, 2009) (however the converse can also be true; Webb & Whiting, 2005, also see Burger, 2001). While disturbing a basking reptile is not necessarily linked to mortality or survivorship, it is certainly an important process for them. Evidence shows that basking can be important for temperate species, where temperatures and sun exposure are limited throughout the whole year (Shine 2004). Olsson *et al.*, (1997) demonstrated that when European

Adders (*Vipera berus*) come out of hibernation they use up to 5% of their body mass on sperm production in preparation for the mating season, facilitated by sun exposure. Given that they often emerge from hibernation already in a poor body condition, this is obviously an important time of year for them (see Figure1 for in-situ observation).

Similar evidence demonstrates that even in tropical situations thermoregulation is important for embryonic development and survivorship, with Sup & Shine (1988) showing brooding female Diamond Pythons (*Morelia spilota spilota*) maintain a higher

body temperature partly through basking. Whilst nocturnal herpetofauna do not directly benefit from solar radiation; and are constrained by the limited availability of suitable environmental temperatures, they are still able to thermoregulate behaviourally throughout the night, and appear to be quite efficient (Nordberg & Schwarzkopf, 2019). Basking duration is multi-factored and complex, depending on season, reproductive state, whether animal has fed, etc. Time spent thermoregulating can range from nothing, through minutes, to most of the day (Pearson & Bradford, 1976; Grigg *et al.*, 1979; Hammond *et al.*, 1988; Manning & Grigg, 1997; Herczeg *et al.*, 2003; Mukherjee *et al.*, 2018). Disturbing or catching a basking animal might be interrupting a crucial regulatory process but is not likely to affect mortality or a dramatic change in behaviour. This might be different when considering sites where animals risk being disturbed on multiple occasions, and the animal might not be able to effectively thermoregulate. This needs to be assessed on a case-by-case basis, given factors like time of year, reproductive status, etc., and should always be something carefully considered.

Occasionally, reptiles and amphibians are encountered in the middle of natural behaviours, which are, no doubt, important for the animal. Snakes, for example, are renowned for going

long periods of time without eating (McCue, 2007) and, therefore when they do feed, it is an important event for them and they even change their digestive physiology in respect to this (Secor & Diamond, 1998; 2000). Disturbing a snake that is feeding or has recently fed can cause it to regurgitate, meaning the energy expenditure on prey capture, up-regulation of metabolism and the life of the prey animal are potentially wasted; a preventable and negative experience for the animals involved (See Figure 4 for in-situ observation). The same can be said for individuals mating, egg-laying, or involved in other courtship or combat behaviour. Although anecdotes and some field observations note that individuals appear focused on these behaviours, irrespective of disturbance (Sasa & Curtis, 2006), greatly disturbing these animals might inhibit them from successful reproduction and have a subsequent downstream effect on the whole population – particularly pertinent to species at risk. Observing and appreciating these natural behaviours from a distance is far more rewarding; and may even be note-worthy to contribute to the scientific literature in the form of a natural history note (see Figure 3 for in-situ observation).

General handling practices vary widely, from not at all, to “freehandling” venomous species. There are some generally accepted practices when it



Figure 3. An Ornate Gliding Snake (*Chrysopelea ornata*) wrestling with a large Tokay Gecko (*Gekko gekko*). The snake attempted to predate the gecko however as you can see the gecko is putting up a fight. Eventually the gecko succumbed, potentially from the venom, and/or constriction. A fascinating and exciting observation witnessed without intervention.

comes to handling, such as appropriate tools and restraint methods, which aim to reduce overall stress and safety for the handler and the handled. If our aim is to reduce stress to the animal, then the simplest solution is to simply not handle, which is somewhat antithetical to the definition of “herping”. There is a huge swathe of literature assessing the physiological stress response of herpetofauna through corticosterone levels after capture and handling, and it is not surprising to

hear that it almost always facilitates an increase. Associated increases in corticosterone levels can also influence other physiological processes, particularly reproduction (e.g. Moore *et al.*, 1991; Lutterschmidt & Mason, 2010; Carr, 2011; Gomes *et al.*, 2012), and while some of these studies are *ex situ* in nature, others explicitly used capture and handling to initially elicit the stress response. Despite this, there is nothing notable linking stress to individual survivorship, although there is perhaps

some implication for reproductive success and downstream effects on populations dynamics (e.g. Meylan *et al.*, 2010; Tokarz & Summers, 2011). To put it in context, capture and handling of animals, particularly on multiple occasions, for long durations and in unnecessary situations, should be avoided. Given the lack of current evidence demonstrating mortality or direct causation of population instability through altered behaviour (as a result of capture and handling), completely abstaining from it is likely unnecessary, but some sensible level of the impact on the animals wellbeing should be considered, especially when considering that physical manipulation (and even sound) is likely more impactful than practices like flash photography (Huang *et al.*, 2011; De Brauwer *et al.*, 2019).

Respect for the habitat

Flipping rocks, logs, coverboards and other refugia, either natural or artificial can be quite effective in detecting herpetofauna, particularly small snake species (Halliday & Blouin-Demers, 2015). There is a large body of literature stressing the importance of microhabitats for herpetofauna, providing sheltering and thermoregulatory opportunities, with some studies demonstrating how destruction and removal of rocks can significantly reduce species abundance and richness (Schlesinger & Shine, 1994; Goode *et al.*, 1998). Of course, if refugia

is not removed or destroyed, it can continually be used by animals, and many anecdotes will demonstrate that the same individuals can be found under the same piece of cover even if disturbed. Contrary to this, Marsh and Goicochea (2003) reported that plethodontid salamanders start to avoid cover boards if they are extensively surveyed, potentially misleading population estimates and decreasing encounter rate. It is yet to be assessed whether this holds true for other species. Given the importance of refugia to herpetofauna, it is important to minimise disturbance as much as possible, by returning the refugia to its original position, taking care to not squash any animals (including invertebrates) residing there. The take home message is to leave things as you find them, impacting as little as possible.

Amphibians, on the other hand seem relatively resilient to habitat disturbance. With Canessa *et al.*, (2013) showing that an endangered endemic amphibian, the Apennine yellow-bellied toad (*Bombina variegata pachypus*) breeds in sites that are frequently disturbed (both naturally and anthropogenically), leading to less aquatic and bank vegetation and fewer predators. Another study by Warren & Büttner (2010) examined the density of amphibians (including 2 endangered species) amongst breeding pools on military training areas

in Bavaria, Germany. They found that most species, including the endangered ones, showed a preference for sites with more ground disturbance, characterised with bare ground and minimal vegetation. The authors do note that this may be conflated with habitat preference and on the macrohabitat level; the sites are a mosaic of disturbed and non-disturbed areas. These results may indicate support for the

“Intermediate Disturbance Hypothesis”, which itself has faced much criticism in overlooking the complexity within spatial-temporal distributions of animals (Wilkinson, 1999). Given that nearly all our wildlife and their respective environments face multiple threats and disturbances, it seems unnecessary to contribute more, so while habitat disturbance may not be as damning for



Figure 4. Common Asian Tree Frogs (*Polypedates leucomystax*) in amplexus, producing a foam nest. The smaller male (right) fertilises the spawn which the female deposits in a foam nest, formed by “fluffing” up with her hindlimbs. This breeding behaviour was witnessed in-situ without any need for disturbance, while still achieving aesthetic photographs.

amphibians, it is certainly something to consider. Perhaps of more concern to amphibians and water bodies, are diseases such as chytridiomycosis (chytrid). Caused by the fungus *Batrachochytrium dendrobatidis*, and its salamander-infecting counterpart *Batrachochytrium salamandrivorans*, it can manifest in lethal skin lesions, and is implicated in the decline or extinction of multiple amphibians (Skerratt *et al.*, 2007). The fungus has proved remarkably resilient, surviving for up to 3 months in river sand, and hours of desiccation (Johnson & Speare, 2005). A major concern is that field herpers and researchers are unknowingly spreading the pathogen from one water body to another, through contaminated footwear and equipment. Biosecurity is now an integral part of most official survey procedures, and with other diseases such as Ranavirus and Snake fungal disease (Ophidiomycosis), it is time for us all to take this more seriously. This means thoroughly cleaning and disinfecting boots, buckets, bags and hooks between sites and between interactions, minimising any role we may play in spreading these pathogens.

Respect for others

Recreational herping occupies a unique social space in which individuals brag about “lifers” (the first time you observe a species in the wild) and spend hours getting the “money shot” photograph,

while simultaneously gatekeeping the hobby and being reluctant to share data on the location and conditions of their observations. This is not entirely unjustified; if a site is publicly shared it may face more intensive disturbance and bad characters such as poachers and collectors. On the other hand, sharing observations and discoveries can endear reptiles and amphibians both in the public and amongst colleagues, perhaps leading to positive conservation practices and meaningful data collection. Ultimately, site-sharing comes down to a judgement call, and indeed this article is written to provide some guidelines on minimising disturbance so that herping can be shared amongst researchers, photographers, and the public alike.

Being a responsible herper is not just about respecting the animal and respecting the habitat, but also about being a responsible role model for anyone else interacting with wildlife, professional herpetologists and amateur hikers alike. By demonstrating in situ photography, safe and minimal handling, and biosecurity, we set an example of a respectful, ethical approach to human-wildlife interactions, instead of a competitive sport. Herping and photography can be a powerful tool in aid of conservation; but is all too often manipulated in the pursuit of personal glory. The default should not be “everyone else is doing it, so it’s okay”, it should be a contemplative

assessment of what is appropriate in the context. This article has aimed to bring some of this “contemplative assessment” to the forefront of decision-making processes while interacting with reptiles and amphibians. It should also be noted that the responsibilities involved with removing specimens from the wild for personal collections, museum or zoological institutions, or consumption, where it is legal to do so, is not considered in this review, as whether or not it may be beneficial to the parties involved must be taken on a case-by-case basis.

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