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Research paper

Etiquettes and ethics for the responsible herpetological collections and management

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Abstract

‘‘A person without ethics is a type of wild beast loosed upon this world, “Albert Camus”. “Herping” is the act of searching for reptiles and amphibians, usually applied to scientific data collection in the field, and for any survey procedure, they directly seek out herpetofauna. Herping is often a hands-on activity, involving the subject's capture, survey for population estimation, diversity, and photography. Being hands-on with a subject is more interactive and useful, allowing you to closely examine the animal and take detailed and beautiful photographs, which can sometimes be necessary if you plan to collect data about a species in the field. However, hands-on training can introduce various negative impacts on wildlife, such as stress, habitat destruction, and even reptile diseases in the studied area, so responsible interactions with these animals are necessary to avoid such negative effects.

Keywords: *Ethics, Etiquettes, Herps, Collection, Management.*

1. Introduction

Herping is a somewhat “learn on the job” activity; the more time spent in the field, the more experience you gain in dealing with different situations and interactions, and ultimately, the better you will benefit from it (Safi and Khan, 2014; Gilbert, 2021). During field collections, surveys, and experimentation on animals, the researchers must follow the 4 “Rs” (Reduction, Refinement, Replacement, and Responsibility). Natural habitat management and accurate knowledge about spatial distribution are essential for effective management and responsible interaction with the herpetofauna in the field. Humans are changing natural ecosystems in profound and unprecedented ways. Humans’ role as agents of modification in a bad direction has given rise to differing ethical approaches to nature and wild species. Scientific professionals face the challenge of making moral decisions about complex tasks (Perry, 2016). In the case of field biology, especially herpetology, the effect we might have on populations and habitats that transcend our scientific study of organisms must also be considered. Most researchers think that the design of their studies, decisions, and concepts can be especially vexing for ecologists and environmental scientists, which is short-term and often problematic (Perry and Perry, 2008; Curzer et al., 2013a, b, 2016).
The editors of some major herpetological journals published a joint editorial focused on the challenges of getting sufficient and timely decisions, reviews, guidelines, and ethics in research (Perry et al., 2012). “Science” reported on another retraction of a high-profile study and on the firing of more than two dozen open-access journals whose publications are designed to maximize the benefits of herpetological ethics (Perry, 2016). This raises questions about ethics, health, and the role and responsibilities of data sampling and collection of herping. The current article aims to bring some objectivity to responsible interactions with herpetofauna and other 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 or collecting data on the herpetofauna of the desired area and species. Every type of reptile is unique in its habits and habitats and thus requires different precautionary measures when handling. Some species prefer or can bear extensive handling, others should only be touched when you need to conduct tasks such as changing their habitat or cleaning their tank in case of captivity.

1.1 Necessary items and protocols for herpetological collections and management

The following are the lists of items and necessary rules and regulations to be aware of amphibian and reptile collections/surveys in the wild. These general guidelines will increase the experience for your field crew and those who follow.

Part I. Field work list of necessary items:

- Camping equipment
- Items for personal use
- Necessary tools
- First Aid with some common medicines
- General herpetological collecting equipment
- Tissue sampling equipment (Note: Many countries require permits for the collection and exporting of tissue samples)
- Plastic bags, heat-sealed, HDPE buckets, shipping boxes, preserving trays (Note: Many countries require permits for collecting and exporting specimens)
- Snakebite treatment kit
- Recording device
- Fixatives and preservatives
- Ethyl Alcohol Permits (Only applicable to some countries)
- Containers
- Gaskets
- Jars and vials
- Specimen tags
- Skeletal boxes
- Tissue papers
- Digital balance and scales for weighing and measurement
- Cotton swabs
- Sacs
- Forceps

Part II. Field trip planning and field collecting:

- Permits
- Steps in planning fieldwork
- Bringing specimens into the laboratory/museum
- Ethics and the importance of collecting materials
- Field team selection

Part III. Making the collection:

- When to collect?
- What to collect?
- How do you correct it?
- How much to collect?
- How much time does it take to prepare specimens?
- Collecting techniques and equipment
- Specialized techniques for organisms
- Evaluation of capture techniques
- Photography
- Audio recording
- Field recording, video, and photography techniques
- GPS recording system

Part IV. Preservation of specimens:

- Field preservation kit
- Field notes, field journals, and field catalog
- SOP for processing specimens in the field
- SOP for packing and transport of specimens
- SOP for preparing specimens for skeletonizing
- Emergency substitutes for fixatives and preservatives
- Freezing specimens
- Skeletal preparation
- Clearing and staining

Part V. Museum collections:

Conservation of herpetological collections

- Fluid-preserved specimens
- Skeletal specimens
- The storage environment for herpetological collections
- Monitoring the storage environment

The Collection storage facility

- Safe storage and handling of fluid-preserved specimens
- Selection of a preservative
- Transfer of specimens from fixative to preservative
- Trace amounts of formaldehyde in preservative solutions
- Tagged specimens
- Specimen tags
- Preparation of labels
- Container labels

Containers and closures

- Glass containers
- Closures
- Compressible stoppers
- Non-compressible stoppers
- Lids held in place by a clamp/bail
- Snap-on lids
- Threaded lids
- Plastic containers
- Containers for large specimens

Online taxonomic sources

- Internet availability
- Laptop/Android mobile cellular phone
- Amphibian Species of the World
- The Reptile Database

Part VI. Respect public and private properties:

- Obtain written permission before entering public or private property.
- Respect the original position of any landscape, fences, buildings (even abandoned buildings), and livestock.
- Do not enter properties with your vehicle unless authorized, and Park along the road or in designated parking areas.
- Take all your trash with you.
- Always place cover objects back when you find them.
- At the end, show the animals or pictures of the herps to the landowner/park personnel you discovered on their land.

Part VII. Respect for laws/regulations:

- It is your responsibility to know the geography of the field and local/park statutes, refugees, and trespassing.
- Endangered, threatened, or Species in Need of Conservation [SINC] must be determined.
- The person should get a permit/license (Note: Many countries have different rules for this)

Part VIII. Respect herps:

- How to identify the local herps before you go? (e.g., venomous and venomous species.
- Do not handle any unknown snakes.
- In your haste to grab a venomous snake under a stone, do not neglect to notice the other individual lying concealed right next to it.
- Minimize your disturbance of den sites, etc., as it may hurt animals.
- Do not handle animals if you have chemicals in your hands.
- Do not put different species in the same jar.
- Be sure that you are familiar with and comply with all these rules and regulations (Every country has its legislation regarding the capture, transport, and keeping of wild animals).
- Do not release non-native animals into the wild.
- Animals used in research must be housed, fed, and cared for by the highest standards of animal welfare.
- Researchers are responsible for ensuring that animals are used only for scientific purposes that are justified and necessary.
- Researchers must have adequate expertise in animal handling, care, and species-specific needs.

Part IX. Respect other herpers:

- Give yourselves space and do not turn ahead of others.
- On slopes, ensure that the cover does not 'break loose' when there are herpers below you.
- Record and note your spots and information to assist other researchers by increasing their knowledge of the local herpetofauna.
- Stay out of research sites, and do not disturb traps or cover objects set by others.

Part X. Respect the public:

- Going to the field alone is not recommended; let friends, family, and colleagues know when and where you are going and when you expect to come back.
- It is better to wear reflective clothing when road-crossing or herping on the road.
- Avoid impacting areas immediately adjacent to a trail when field herping on public land.

Part XI. Transparency and Accountability:

- Researchers should be transparent about their research methods and findings, including negative results.
- Researchers are accountable for the ethical conduct of their research and the welfare of the animals involved.
- The public should be informed about the ethical considerations and regulations surrounding animal research.

Part XII. Preventative measures against any potential zoonotic diseases from amphibians and reptiles:

- Wild animals should always be handled with a great deal of care and respect, as they can use their claws or teeth to dig into clothing or flesh and cause various types of injuries.
- Only trained and experienced members should handle herps whenever needed.
- Wear personal protective equipment (PPE).
- Use sanitizer and antiseptic lotions between gloves, if required, until you can access handwashing facilities.
- If you get any injuries during work, report them to your supervisor and seek medical attention promptly.
- Many zoonotic diseases have minor symptoms. Your physician needs this information to make an accurate diagnosis and prescribe appropriate medication.
- The transmission of pathogens from herpetofauna to humans is relatively very low, and in general, humans acquire these pathogens through poor hygiene.
- Some of the important zoonotic diseases that can be acquired by handling amphibians and reptiles without precautionary measures are as follows (Mendoza-Roldan et al., 2020).

Salmonellosis: This disease is caused by a bacterium (*Salmonella*) that inhabits the gastrointestinal tract of many animals and humans. Common symptoms of this disease are acute gastroenteritis with the sudden onset of abdominal pain, diarrhea, nausea, and fever.

***Aeromonas hydrophila*:** This species of bacterium is present in all fresh and brackish water ecosystems. Infection is usually contracted through cuts or by ingestion of unhygienic food or water. Common symptoms are nausea, vomiting, diarrhea, and, in some cases, wound infections.

***Edwardsiella tarda*:** This is a bacterium usually found in the intestines of poikilothermic animals in freshwater ecosystems. It causes nausea, vomiting, and diarrhea, and can also be associated with meningitis and septicemia. Transmission is through fecal-oral or ingestion of unhygienic food.

Melioidosis: This disease is also known as "Whitmore's disease" caused by the bacterium *Burkholderia pseudomallei.* This disease is predominantly recorded in tropical areas, especially in Southeast Asian countries.

***Amphibian chytridiomycosis*:** This is a dermal disease caused by the fungal pathogens *Batrachochytrium dendrobatidis* and *B. salamandri-vorans*, commonly referred to as "Amphibian chytrid fungus" or by their abbreviations "Bd" and "Bsal." This fungal disease originated in Asia, where the fungus is widely distributed in Japan, China, and Southeast Asia, having existed there for millions of years. The fungi spread through zoospores that swim freely in water. The degree of intensity of the disease can range from minimal to lethal (Stegen, 2017; Yap, 2017). This fungal disease is not known to affect humans, but humans can spread this disease by interacting with infected and healthy individuals simultaneously.

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