

## British Herpetological Society: Ethical Policy and Guidelines

The AIMS of the BHS include ‘The promotion of the study and protection of amphibians and reptiles, in particular through scientific research, captive breeding and husbandry, conservation and fieldwork, and education’. These aims are achieved in part by the publication of research on amphibians and reptiles in the Society’s two scientific journals: The Herpetological Journal and The Herpetological Bulletin. It is a requirement of research published in these journals that it adheres to the Society’s ethical policy.

The essential principles governing BHS policy on research on animals follow the ethical theory known as utilitarianism. In this, the main benefit of research is the increase of knowledge. Knowledge is a general benefit to people, but it can also be of practical benefit to the animals concerned in helping people to understand better how to protect them (for example, from disease) and to conserve both them and their habitats. However, research can impose costs on animals, ranging from mild (such as light stress from being closely observed), through to severe, as when an animal dies, possibly painfully, in the course of a study. Utilitarian ethics justifies research when the benefits exceed the costs. In the case of research on animals, this means that studies which impose the severest costs on animals require the greatest justification. As an example, if a study involves killing frogs, BHS would require that the knowledge gained is substantial, and not merely confirmatory; and if a large number of frogs are killed, then the knowledge gain would need to be very substantial. In addition, BHS would expect evidence that the methods used to kill the frogs is humane. BHS would be unlikely to accept a study if the frogs killed are in the higher IUCN Red Data categories.

Research on amphibians and reptiles occasionally involves potential harm to the researchers, especially when studying venomous snakes, or carrying out fieldwork in remote or hazardous locations. BHS requires a statement that any research has been preceded by a risk assessment and that the recommended procedures have been followed. Equally, there are ethical implications concerning the impact of the research on people. An assessment therefore needs to be carried out of any potential implications of the work for local people’s livelihoods, religious beliefs or cultural practices. If the research subjects involve people (e.g. using a questionnaire survey to determine attitudes or knowledge), then the research must follow the principles of informed consent, ensure that the identities of participants are protected, and a statement provided concerning the ethical guidelines consulted (e.g. <http://www.esrc.ac.uk/funding/guidance-for-applicants/research-ethics/>).

Other organisations involved in animal research have developed substantial ethical guidelines. Rather than develop something entirely new, BHS has drawn from existing sources. The principal ones are: Guidelines for the Treatment of Animals in Behavioural Research developed by

the Association for the Study of Animal Behaviour (ASAB, 2012); the Universities Federation for Animal Welfare Handbook (Hubrecht & Kirkwood, 2010), especially the chapters on terrestrial and aquatic reptiles and on amphibians; guidance on wildlife research provided by the National Centre for the Replacement, Refinement & Reduction of Animals in Research [<https://www.nc3rs.org.uk/wildlife-research>] and Guidelines for Research on Live Amphibians and Reptiles developed by the American Herpetological Animal Care and Use Committee (HACC, 2004).

### BHS policy has the following components:

1. **Compliance with legislation:** Research submitted to BHS derives from countries all over the world. Legislation governing research on amphibians and reptiles may be specific to one country, or it may be international. For example, many countries have laws regulating experimentation on animals, both in the laboratory and in the field, such as the UK’s Animals (Scientific Procedures) Act. BHS expects full compliance with the legislation of the country where the research is carried out, and requires a statement from the authors confirming compliance. When a country lacks such legislation, BHS may require that the research complies with an alternative legal framework. In addition to national legislation, individual research institutions often have ethics committees that regulate animal research: BHS expects a statement of compliance with any local requirements of that kind.

An example of relevant international legislation is the Convention on Trade in Endangered Species of Fauna and Flora (CITES), to which nearly every country is a party. BHS expects full compliance with relevant international legislation and, again, a statement of confirmation.

Data from all work that involves the research, euthanasia or removal of animals from the wild must be collected in accordance with the country’s national legislation, with all research and collection permits in place prior to the fieldwork or research commencing. In addition, the Nagoya Protocol on Access and Benefit Sharing (ABS) is a 2010 supplementary agreement to the 1992 Convention on Biological Diversity (CBD) that aims to ensure the fair and equitable sharing of benefits arising out of the utilisation of genetic resources, thereby contributing to the conservation and sustainable use of biodiversity. This legislation entered into force on 12 October 2014, and all genetic material collected from natural resources (i.e. living wild organisms) of party states is subject to this legislation. If material is transported out of the origin country, it is the authors’ responsibility to ensure the correct collection and export permits have been lodged with the origin countries’ Access and Benefit Sharing Clearing House, and the subsequent Internationally Recognised Certificate of Compliance (IRCC) issued prior to exportation of materials.

**2. Laboratory practice:** Few, if any, species of amphibians and reptiles can be considered as having populations adapted to laboratory life in the way that laboratory rats and mice are. Researchers therefore need to remember that they are studying wild animals kept under captive conditions, and that this could be potentially stressful to the animals. BHS therefore requires that laboratory research should be carried out under high standards of welfare and that submitted papers include a clear statement of husbandry conditions and of how welfare was achieved, either in the main text of the paper or if more appropriate, as part of supplementary material. General husbandry methods for amphibians and reptiles are provided in Hubrecht & Kirkwood (2010) and in HACC (2004), but more specialist literature may need to be consulted. Factors to consider include enclosure design; environmental conditions such as humidity, light, temperature; feeding; health, including disease prevention; social interactions; environmental and behavioural enrichment. Enrichment remains an under-reported aspect of amphibian and reptile husbandry (Burghardt, 2013; Michaels et al., 2014), and BHS welcomes the submission of new studies.

**3. Fieldwork practice:** Fieldwork on amphibians and reptiles can involve a wide range of activities, with the effects on the animals varying from negligible or mild to increasingly severe: animals may be:

- simply observed with no or minimal disturbance; animals may be measured with minimal disturbance, such as taking carapace lengths on a nesting marine turtle;
- captured for a time just long enough to take non-invasive measurements, then released;
- captured to allow invasive sampling, such as taking blood samples or skin swabs, then released;
- marked in some way, so as to allow them to be recognised again, then released;
- attached to some kind of data-recording device, then released;
- captured and taken to a laboratory for a short time, so that observations not feasible in the field can be made, then released back at the original site;
- captured and set up in an experiment which mimics aspects of the natural environment, with later release as a possible outcome. Such experiments may be termed 'semi-natural'.
- captured and killed in order to collect data not available from live animals, or in order to preserve the specimens for museum collections.

In all cases, BHS expects a clear account of the methods used, including measures taken to reduce stress or discomfort to the animals. Marking and euthanasia are discussed in the next section.

**4. Marking and euthanasia:** Although any laboratory or field procedure can cause stress in animals, among the most problematic from an ethical viewpoint are marking methods and killing techniques. Marking is much used in population and behavioural studies as a way of recognising individuals after release. Examples are the use of flipper tags to mark

marine turtles and the use of toe-clipping to mark lizards and frogs. The ethical questions are: does the creation of the mark cause pain, and if so, is it short or prolonged, and does the mark affect the behaviour and survival of the individual? Toe-clipping of frogs has long been controversial with advocates both for and against (compare Grafe et al., 2011 with Parris et al., 2010). The BHS view is that toe-clipping should only be used as a method of last resort and for important studies. For amphibians, the ready availability of cheap digital photography allied to the growing recognition of individually variable cutaneous markings should render toe-clipping obsolete for many species.

In some studies, the killing of animals is necessary in order to gather essential information, such as the documentation of a voucher specimen. Since death is a normal aspect of life, ethicists generally do not regard death as a harm in itself. However, the experience of death can be long and painful, and that is a harm. For any research that requires the death of animals, the aim must be euthanasia, i.e. death should be rapid and free of stress and pain. BHS expects a clear account of the euthanasia methods used. The number of animals killed should be kept to a minimum, since excessive killing could harm the viability of the population, and sample sizes should be justified based on existing literature and/or statistical power analyses.

**5. Toxicity testing:** Amphibians and reptiles are not generally used to test for the toxicity of substances such as agrichemicals when there is a concern that people may be harmed by these substances. It is therefore entirely possible that such substances may cause unintentional harm to amphibians and reptiles, and there is growing evidence of such effects (e.g. Orton & Tyler, 2015).

Experiments designed to assess the impact of potentially toxic substances on amphibians and reptiles inevitably generate ethical concerns, since there is an expectation that some animals may be harmed. Under the UK's Animals (Scientific Procedures) Act, deliberate exposure of adult amphibians and reptiles to experimental toxicity testing would require a licence, since they are covered under the heading of 'live vertebrates'. The situation is different for early developmental stages; anuran amphibians are not considered as 'live vertebrates' until the onset of active feeding, around Gosner (1960) stage 24/25. This means that toxicity testing on anuran embryonic stages is not subject to UK regulation. For amniote vertebrates, including reptiles, the equivalent critical point is mid-way through egg incubation.

For toxicity assessment papers submitted to BHS publications, the ecological relevance of the study must be clear, compliance with legislation must be explicit, and the number of individuals exposed to harm kept to a minimum and justified using existing literature and/or statistical power analyses.

**6. Conservation aspects:** Culling, disease, captive breeding and release: The motivation behind much wildlife research is conservation, i.e. the desire to maintain the diversity of wildlife and wild habitats. However, conservation procedures can come into conflict with animal welfare and

therefore arouse ethical concerns (see Conservation and Animal Welfare Science Workshop (2010) for an attempt to resolve such conflicts). An obvious example is the culling of one species, often an alien invader, in order to improve the life chances of others. A herpetological example is the culling of cane toads in Australia, where their rapid spread since introduction in 1935 is regarded as a serious threat to many native species.

Another potential harm is the inadvertent spread of disease by researchers during their work aimed at conservation. The most obvious example is the spread of the chytrid fungi *Batrachochytrium dendrobatidis* and *B. salamandrivorans* via researchers' boots and sampling equipment. Where chytrid is a risk, it is good practice to clean and sterilise boots and equipment between sites. BHS expects papers describing fieldwork in areas where disease spread is a risk to include an account of the measures taken to minimise that risk.

Captive breeding and release is widely regarded as a method of last resort for saving species at severe risk of extinction (Marris, 2008), but release protocols and associated technologies are improving all the time. When considering for publication any papers reporting on release programmes, BHS expects a clear statement of the preparations made to maximise the chances that released individuals will thrive, including permissions obtained from the relevant regulatory authorities.

**7. Numbers:** In carrying out field or laboratory studies that have the potential to cause harm to individual amphibians and reptiles, it is important to consider the number of animals to be used. In many cases this should involve a statistical power analysis to ensure that the results obtained do not fail to reach statistical significance simply because of samples being too small. This is an ethical issue because such a study would have harmed animals without having any reliable result.

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