

INSTRUMENTS, EQUIPMENTS FOR WILDLIFE STUDIES

Capture, handling, release methods: Most wildlife studies in the field include the use of capture, mark and release programmes. The techniques adopted in these programmes can have far-reaching consequences, so it is important to be aware of, and where possible, minimize the potential adverse effects not only on the study animals but also the other animals in the environment.

General welfare issues

Time of year

Research may lead to disruption of normal animal activities, whether as part of the

study procedure or incidental to it.

Disturbance of breeding individuals and dependent juveniles is of particular concern. Investigators should be aware of the breeding seasons of the species that they propose to study and ensure that there are no significant welfare implications associated with the timing of their research.

Time of day

An awareness of an animal's circadian activities is essential for appropriate capture and handling. Nocturnal animals should be kept in darkness when held in traps, as being away from cover during daylight hours will cause them further stress.

Animals that are caught without the use of food baits (eg, mist netting of birds and bats) should be released with enough time to forage. If this is not possible, consideration should be given to provision of supplementary food and water or a glucose solution before release.

Extreme weather conditions (heat or cold)

Checking weather forecasts should always be a priority when carrying out field work. In the UK, the Met Office provide a pay - for service in which detailed, tailored forecasts can be sent directly to an email account.

Trapping should be avoided during extreme weather

conditions to reduce the possibility of hyper or hypothermia. Shelter and extra warmth should be considered especially when anaesthetizing animals in cold conditions (e.g, heat pads, blankets, bubble wrap).

Methods

telemetry: external and internal, VHF, GPS and proximity transmitters;

- external ringing and tagging (bird and bat banding,

mammal ear tags, wing tags);

- physical marking (tattooing, fur clipping, scale

marking);

- internal marking (microchips, fish wire tags);

- natural markings.

Telemetric/ GPS devices

A wide variety of attachment methods for both types of transmitters exists (collars, tags, implants). External devices should be as light in weight as possible and should not usually exceed 5% of the body mass of the animal (< 3% is recommended). Devices that break away after sampling, at the end of the useful life of the transmitter or those with a remote release are preferable.

Collars/harnesses should always be fitted to allow room for growth and natural variation in body mass, which can be pronounced in some species. For example, when fitting collars on small – medium

mammals, insert fingers between the neck and the collar to judge the appropriate fit for.

Ringling

This is the most accepted method of marking birds. In the UK, ringing is not regulated under legislation relating to animals used in research but attachment of any marks or tags to wild birds requires formal training and a permit from the British Trust for Ornithology

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Scientists can obtain scientific permits that are more restricted in their scope, but may require less diverse training and accreditation.

Tagging

When tagging animals, bright

colors should be used with caution as they may affect camouflage and act as an attractant for predators –they also make the animals visible to members of the public. In addition, tags should be thoughtfully placed so that they are not likely to snag or get caught on vegetation, potentially leading to tissue damage; this is of particular relevance for animals that squeeze through crevices or holes (e.g. bats, rats).

Physical marking

Fur clipping is a good non - invasive method of temporary marking an individual but its use is limited in most studies due to its short duration. In contrast, tattooing is a permanent mark

and of great benefit in long - term population studies. However it should be noted that it always requires anesthesia and does pose a risk of infection (especially for fossorial animals) and hence the use of antiseptic sprays or creams on the tattooed area is recommended.

Natural marking

Individual identification based upon natural markings is an under utilized refinement method. The theory behind individual identification involves the use of physical markings, patterns or coloration to distinguish between conspecifics.

The advantage of this method is that it

enables identification without extended periods of handling, therefore minimizing disturbance to the animal. It also has low cost compared to other methods (Doody 1995). The age of digital photography has also provided a method of storing a large number of pictures, which can be viewed easily and transferred between facilities. The method has now been used for range of different species including many types of amphibian.

Marking techniques that cause significant tissue injury, such as branding and toe, ear and tail clipping, should be avoided.

If no alternative methods can achieve the desired results then researchers need to ensure that the

marking process does not cause unnecessary tissue damage, pain, and/or severe blood loss. Adequate pain control is a necessity when undertaking such procedures.

The method used will depend on the species and type of study. When choosing a marking technique, primary consideration should be given to methodologies that are the least invasive, do not require recapture for identification, and will remain visible for the duration of the study. In addition, marks should:

- be quick and easy to apply;
- be readily visible and distinguishable;

- persist on animals until all research objectives are fulfilled;

- not introduce bias by having variable tag retention rates;

- not cause long - term adverse effects on health, behavior, longevity or social life;

- comply with any legal restrictions or regulations;

- allow for seasonal changes in mass and growth of juvenile animals.