

# Wildlife Research and the IACUC

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**[Editors note: USDA is in the process of revising the definition of field study. The final notice should be published sometime in Fall 1999.]**

The Institutional Animal Care and Use Committee (IACUC) is challenged with many duties under the Animal Welfare Act (AWA) and Public Health Service (PHS) Policy. Because of the diverse number of situations in which research animals may be used, regulatory agencies have appropriately shifted much responsibility for ensuring adequacy of animal care to IACUCs. The *Guide for the Care and Use of Laboratory Animals (Guide)* and the *Guide For the Care and Use of Agricultural Animals in Research and Teaching (Ag Guide)* provide both general guidelines and specific variables for animal care and housing for traditional laboratory and farm animal species, respectively. Requirements for housing wildlife research animals (fish, birds, reptiles, amphibians, and wild

mammals) and their use in research, however, are necessarily much less specific. The tens of thousands of species of fish, birds, amphibians, reptiles, and mammals makes specific guidelines regarding animal care difficult at best.

Additionally, biological requirements for many species under study are not only unknown, but are often the subject of the study itself.

Each country, State, province, or local authority may have its own requirements that must be followed. The IACUC must apply the general principles contained in the AWA, the *Guide*, the *Ag Guide*, and the American Veterinary Medical Association (AVMA) Panel on Euthanasia to wildlife studies. The web sites of the United States Department of Agriculture Animal and Plant and Health Inspection Service (USDA-APHIS) and the Office of Animal Welfare (OLAW) contain many helpful policy interpretations and clarifications. Many professional societies and organizations have produced guidelines for the use of species with which they commonly deal. These are excellent supporting references for use by IACUCs to generate institution specific policies. Using these guidelines also leads to consistency in animal care across institutions, easing and improving investigator compliance as institutional affiliation changes. Clear written policies and procedures reviewed by wildlife investigators and approved by the IACUC and the Institutional Official (IO) are essential in ensuring compliance by all individuals. Institutional policies should always be designed to obtain the desired outcome of both the PHS Policy and the Animal Welfare Act, that is, humane care of all animals. Veterinarians and scientists trained with the species and procedures under review must always be involved in development of IACUC policies.

Population dynamics, observational behavioral studies, disease pathogenesis and management, and effects of potentially negative environmental factors on wildlife populations are all common topics addressed in wildlife research at our institution. These all involve varying aspects of potential harm to animals being used in a research project. This article explores some of the challenges the

attending veterinarian, the IACUC, and the investigator face when conducting wildlife research.

### **When do I need to have IACUC review?**

The most common question our IACUC receives from new investigators is what procedures require IACUC review? Several factors were considered when our IACUC developed our policy: the species and age of subject being used, the funding agency for the project, the affiliation of the individual with our institution, and the importance of animal care and use at our institution.

The point in development at which oviparous, ovoviviparous, and viviparous species become regulated animals had to be decided. The determination for viviparous was based on that of the AWA, at birth from the maternal animal. OLAW has ruled that birds become regulated animals once they have hatched from the egg. These concepts are easily transferred to ovoviviparous species, but less clear with many oviparous species. For fish, our IACUC has determined this same stage of development to be the "buttoned-up" stage, or when the embryo has fully absorbed the yolk sac and must forage on its own. Other IACUCs may choose an earlier point. As a result of our definition of when an animal becomes regulated, work with gametes and early embryos in fish is not regulated unless the animal is allowed to develop to or beyond the buttoned-up stage.

In enforcing the AWA, APHIS requires IACUC review of *all projects which materially alter the behavior of animals under study*. The AWA only applies to warm-blooded vertebrate wildlife species. It considers simple, noninvasive capture and release procedures to not be covered under the AWA, and thus does not require IACUC review. Examples falling in this category might include measuring variables such as weight and length, sampling blood, and reviewing other general health indicators. Some forms of animal identification, such as tattoos, ear tags, and radio-collars, would also fall into this category. Any invasive procedures, such as surgical implantation of a transmitter, or housing animals for

periods greater than 12 hours before being released require IACUC review, approval and oversight.

PHS Policy also requires IACUCs to follow AWA requirements. PHS Policy applies to all PHS conducted or supported activities involving live vertebrate animals. In addition, the wording of an institution's Assurance may determine when IACUC review is required. Institutions must specify what projects conducted by them are to be covered by their Assurance. Because the University of Idaho has many production agriculture and wildlife research projects, our Assurance limits its coverage to PHS funded projects . However, if a non-PHS supported activity affects a PHS supported activity, then both projects must comply with the policy. According to a published interpretation of PHS Policy, "only when an institution can document that the animal care and use program funded by a non-PHS source is entirely separate and distinct, physically and programmatically, from PHS-supported activities will OLAW consider its exclusion from the Institutional Assurance."

It would be highly unlikely for a wildlife project conducted in the field to be funded by PHS. However, institutions may voluntarily require IACUC review for field projects to prevent the appearance of a double standard or that they are only performing IACUC review because it is legally required. To ensure appropriate care and use of all animals with which the University of Idaho is involved, our IACUC currently requires review and oversight of all projects involving University-owned animals or performed by University personnel, regardless of who owns the animals, where they are housed, who funds the project, or whether they are reviewed by another IACUC. This is a common practice at academic institutions and is explained in our required introductory training sessions. This does add some paperwork for investigators and the IACUC, which understandably is not always appreciated.

Another factor investigators must consider is the journal(s) in which the investigator intends to publish his/her findings. Regulatory agencies and local IACUCs may not require protocol review, but more journals are doing so before

accepting a manuscript for publication. A written statement that such review has occurred has been common practice in biomedical research for several years and has spread to many agricultural publications. This concept is also beginning to be recognized as an important process in wildlife publications. It is the investigator's responsibility to ensure that IACUC review and approval takes place when it is required by someone other than the IACUC, such as for publication.

### **Special Factors in the IACUC Review Process**

Many field studies reviewed by our IACUC are conducted in remote wilderness areas, either in the State, surrounding States, or at greatly distant sites. The committee relies on descriptions of the site by the investigator or knowledge of the study areas by committee members. Animal capture, handling, housing, surgical, and euthanasia procedures are evaluated in light of the location and local environmental conditions. The terrain, plants and animals, day and night temperatures, predator/prey relationships, other species that may be inadvertently captured, and accessibility to the site are all considered. If significant variations from the AWA or PHS Policy are being sought, the investigator must justify the deviation. If the IACUC believes the request for deviation to be justified, a "variance" or "waiver" would be sought from the governing regulatory authorities before protocol approval by the IACUC. Planning ahead cannot be stressed enough when working with animal subjects that may only present sampling opportunities seasonally.

The committee will also evaluate potential hazards for the personnel working on the project including capture equipment used, handling of the species involved, prevention of zoonotic diseases, bite wounds, scratches, etc. When samples alone are provided to an investigator from another institution, the conditions of collection and care of the animals from which the samples originated are evaluated by the IACUC through a written description in the protocol.

Each protocol is evaluated on an individual basis weighing the relative benefits and risks involved. The same principles are applied to all vertebrate animals. We

do not require protocol review for invertebrate species, but would apply the same considerations if an investigator were to request review of an invertebrate project. External funding agencies are relied on for review based on scientific merit, but each project's goals are evaluated based on its relative merit to the species involved and society. This is especially important when dealing with endangered or threatened species, when potentially painful procedures are involved, and when the local ecosystem may be compromised.

## **Investigator Training**

All personnel must complete our IACUC training program for protocol approval to occur. Depending on the procedures listed in a protocol, investigators and their staffs may be required to complete additional training requirements. Written certification by qualified independent organizations, such as Safe Capture International, Inc., and qualified state or national wildlife veterinarians or other employees is accepted. When an independent certifier is not available, investigators must demonstrate competency to, or be trained (in skills such as surgical techniques) by the attending veterinarian or other qualified personnel for the procedures they wish to perform. This can often be done by performing/teaching the procedure on a related species in captivity .

Our occupational health program provides training on prevention of zoonotic diseases and immunization for tetanus. Those individuals working with wild carnivores may also receive rabies prophylaxis. All personnel who may come in contact with Hantavirus must complete Hantavirus prevention training including the use of a HEPA-filtered respirator. When venomous animals are being dealt with, investigators must keep on hand appropriate antitoxins. Protocols must be designed to limit the number of individuals exposed to potentially hazardous animals and materials. Investigators who have completed our IACUC training program are often delegated to provide training for nonaffiliated field personnel that are working with animals on an approved project.



Researcher removing a deer mouse from a box trap into a plastic bag prior to weighing and releasing. The trap contains a nestlet for bedding, and grain.



Wearing thick gloves, the researcher removes the mouse from the bag and weighs it. The mouse is suspended by the base of the tail by a padded clamp and released seconds later into the wild.

Photos courtesy of M. Kreger

## **Capturing Wild Animals**

Almost all procedures conducted with wildlife require capture and use permits. IACUC approval is not granted until a copy of all required permits has been provided. The means of capture, the location in which captures are to be performed, the target species, the numbers of animals, the procedures which can be performed on the animals once captured, who can perform the capture and animal procedures, and the ultimate disposition of the animals as specified in various permits must be compatible with the information presented in animal care and use protocols.

The IACUC is staffed with one faculty member, and often two, with expertise in wildlife research and regulations. If there is any uncertainty regarding the need for permits, the IACUC will check with the Idaho Department of Fish & Game and the Idaho Division of Animal Industries. When animals or animal tissues are being imported, residents of the United States should consult with the United States Fish & Wildlife Service (USFWS), Department of the Interior (for

Convention on International Trade in Endangered Species of Wild Fauna and Flora compliance issues), USDA-APHIS (<http://www.aphis.usda.gov>) (for potential animal pathogens), and the Centers for Disease Control and Prevention (<http://www.cdc.gov>) (CDC, importation of primates and potential pathogens of human beings) for importation policies at the time of their study. The USFWS's web site (<http://www.fws.gov/>) contains a complete listing of State and Federal wildlife handbooks.

## **Meeting Requirements for Housing and Inspection of Wildlife Animals**

Field projects may occur in remote wilderness areas, fish hatcheries, dams, privately owned facilities, or even facilities outside of the country. The AWA and PHS policy require all study areas and facilities used to hold AWA-covered animals for longer than 12 hours to be inspected not less than every 6 months by the IACUC. As specified in the AWA, animal areas containing free-living wild animals in their natural habitat need not be included in such inspection. By virtue of the PHS Policy definition of "animal facility," animals included under PHS regulations (but not the AWA) must be held for 24 hours or longer in study areas (satellite facilities) or be surgically manipulated in order for the site to require inspection. If an institution chooses to use less than 24 hours for all study areas, it should be reflected in their Assurance document.

It is often not practical or economically feasible to visit each of these remote sites. Since the University of Idaho has facilities throughout the State separated by 300-500 miles, we have added an ad hoc IACUC member who inspects facilities with the attending veterinarian at distant sites. Any committee member who wishes to participate in an inspection should not be prohibited. Waivers may be applied for with both PHS and USDA for special situations where site visits are impractical. IACUCs may also require a signed memorandum of understanding with the responsible authorities at associated facilities. Such agreements should not only address the care and use of animals, but the training required for animal care staff at these facilities, all budget items related to

housing the animals and staffing the facility, and ownership of the animals for animal census reporting purposes and disposition of animals at the end of the project.

Wild caught animals may be brought into permanent facilities on occasion. The conditions for bringing the animals in are specified by the attending veterinarian for the facility. Serologic screening for diseases of concern may be required.

Factors considered include the current disease status of animals in the facility, the type of housing available in the facility (filtered exhaust air, isolation cages, barriers, etc.), the disease status of the animals entering the facility, the biological requirements of and temperament of the animals to be brought into the facility, and qualifications of animal care staff at the facility. Investigators, facility managers, and veterinarians must be creative in developing environments which meet the biological needs of the animal and regulations. With some species, deviations from regulations may be required to meet the biological needs of the animals. Waivers from USDA and/or the NIH, Office of Laboratory Animal Welfare should be sought before protocol approval.

Unless an animal is an endangered or threatened species, its return to the wild is usually discouraged to protect the existing population from diseases acquired unknowingly in captivity. The disposition of animals is normally specified in capture permits, which have ultimate control.

### **Refinement of Protocols**

Because of the cost and difficulty in acquiring wild animals, investigators always try to obtain as much information from one animal as possible. A museum of dead animals and animal parts is maintained with representative samples of species being used in research. Museum specimens are for use in undergraduate and graduate courses, public education programs, and possibly in future research projects. These specimens are often animals euthanized or killed during another project, rather than just for use in the museum. Samples may also be taken and used for karyotyping in other population studies.

Identification and capture techniques must always be the least invasive possible. Requested animal identification methods are evaluated using the same criteria as the investigator most likely used when designing the protocol. Does the individual animal need to be identified, or just as a member of a group? How long does the identification need to remain in place? Will animals be released after identification and identified from a distance, or is recapturing necessary? How aggressive is the species of animal(s) being dealt with? What is the likelihood and necessity of being able to recapture the same animal? How painful is the method of identification? These are all concerns IACUC members consider and weigh against the benefits of the research. Tattoos, hair clipping, radio-collars, ear tags, and other noninvasive methods would be preferred over surgical methods such as toe clipping. The same criteria for surgical procedures used in biomedical research would be applied to wildlife situations. Unless scientifically justified in the protocol, the procedure would need to be performed aseptically and under anesthesia with postoperative analgesics administered.

Live trapping, such as mist nets and Sherman traps, is preferred. The frequency and difficulty of checking live traps, when traps are set and closed, protection from adverse environmental conditions and predators, and provisions for food and water for infrequently checked traps are all considered. Snap traps and other lethal traps may be approved when indicated. The investigator would need to justify the use of lethal traps through the scientific design of the protocol or the elimination of potential health risks to the investigator. This would include health risks associated with removing animals from traps and the euthanasia process. Protocols should also include provisions for dealing with accidental/incidental injuries to animals in traps.

The euthanasia method used must be in compliance with the AVMA Panel on Euthanasia, unless justification is provided in the protocol and approved by the IACUC. Volatile gases in closed containers are preferred in habitats where plague, Hantavirus, or other parasite or aerosol transmitted diseases are likely. Cervical dislocation without anesthesia must be justified in the protocol. Gun shot

of an appropriate size for the species and by qualified personnel is accepted when other alternatives are logistically prohibitive. An example would be the capture and euthanasia of large ungulates, such as deer and elk, that will be euthanized as part of a project in very remote locations and steep terrain.

## Summary

IACUCs are faced with difficult challenges in striking a balance between animal well-being and scientific discovery with regards to wildlife research. The unique environments in which wildlife are found, their biological characteristics, the safety of personnel, and appropriate regulations must all be considered when performing and monitoring wildlife research. A joint effort of cooperation and discovery is essential between investigators, IACUCs, and regulatory agencies to overcome these challenges.

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