

## CHAPTER I. INTRODUCTION

### A. Overview

#### *Context: the study of wild birds*

Ornithologists study wild birds to fill the need and desire to understand the lives of birds in natural environments. Although some studies of wild birds take place in laboratories and aviaries, a growing number of studies of fundamental scientific issues such as behavioral ecology and ecophysiology are conducted on wild animals under natural conditions, as scientists have come to understand the limitations of laboratory and captive work in those areas. Studies are also undertaken for the express purpose of developing appropriate conservation or management strategies in a world in which most species face challenges resulting from anthropogenic changes to the landscape. In either case, the birds studied benefit from that research, as do other species that share their habitats. Often the individual study animals themselves benefit from the research. Whether the primary motivation of ornithological study is the advancement of scientific knowledge or the acquisition of information used for management purposes, wildlife research yields results that are directly relevant to the welfare and conservation of the species, communities, and ecosystems studied. Indeed, species conservation would not be possible without a solid base of information derived from field studies and it could be argued that conservation decisions and actions made without the benefit of a scientific basis could be ineffective or even harmful.

The deep appreciation of and concern for birds that motivates ornithologists to dedicate their research careers to this underappreciated and underfunded research discipline is also expressed in their concern for the impacts of the research on the birds they study. And from a purely practical standpoint, they also realize that they must minimize the impacts of research methods to ensure that the scientific results are valid. They also realize that their methods will be scrutinized and judged not only by the Institutional Animal Care and Use Committees, but also by journals and by the general public.

These Guidelines are formulated with consideration of animal welfare and research needs in the context of these premises, and in the context of the conditions under which wild birds are studied. Guidelines for the care of animals bred in captivity for use in biomedical research generally are not appropriate to wild vertebrates studied in the field or even in captivity. Studies of wild animals entail conditions that are not encountered in laboratory situations. The ordinary

conditions of field work may limit the amount and type of equipment that can be carried or necessitate the use of methods that entail some risk of harm, even when used correctly. Considerations such as the presence of other species and the way the investigation may affect those species, or the way those species may interact with the study species, may arise. Conditions in the field vary so much that it is inappropriate, if not impossible, to identify a best method or unacceptable methods. The guiding principle for these Guidelines and for ornithologists is to always appreciate the potential impacts and select methods that minimize impacts without jeopardizing the ability to collect data needed to answer the research question.

### ***History of Guideline to the Use of Wild Birds in Research***

The ornithological profession has long been diligent about assessing the impacts of research methods and has sought to modify methods to reduce impacts or to find alternative methods. Consistent with these interests in the advancement of scientific knowledge, bird conservation, and the well-being of individual birds and bird populations, the American Ornithologists' Union in 1975 first published the *Report of the American Ornithologists' Union ad hoc Committee on the Scientific and Educational Use of Wild Birds*. In 1988, the American Ornithologists' Union, the Cooper Ornithological Society, and the Wilson Ornithological Society, with encouragement and financing from the National Science Foundation, published the first edition of *Guidelines for the Use of Wild Birds in Research*. When the Ornithological Council was formed by these societies, together with the Waterbird Society, the Raptor Research Foundation, and the Association of Field Ornithologists, responsibility for periodic revision of *Guidelines* was assigned to the Ornithological Council. A major revision was published in 1997, followed by a minor revision in 1999. Each iteration has been peer-reviewed, as has this current revision.

In 2007, the Ornithological Council embarked upon this major revision for the following reasons:

1. A clear, strong commitment to humane research methods is necessary to insure the public and policy makers that the profession is adequately self-policing. It is important to address the concerns of oversight organizations and the public fully and fairly. Self-scrutiny and re-assessment are critical in assuring that researchers develop and use the most humane research methods available.

2. The need for science-based standards is increasingly important. Science-based standards will be valuable to federal agencies that regulate wildlife research and to animal care and use committees in determining whether a practice is appropriate.
3. Institutional Animal Care and Use Committees (Institutional Animal Care and Use Committee) are intensifying their scrutiny of research protocols. A published, peer-reviewed source such as *Guidelines* may be their only source of information about research involving wild birds, and especially about ornithological research under field conditions. Thus, it is important that *Guidelines* be as comprehensive and current as possible.
4. New methods and new data on traditional methods for studying wild birds are vital for ornithologists and others who study wild birds. This information will help ornithologists to learn about new or alternative methods that may reduce the impact of the research on wild birds, or to avoid traditional methods that have been determined to have negative impacts that might be avoided. Studies published since the 1999 edition may have assessed impacts that had not been studied previously, or not well-understood.
5. The permitting section, which was incomplete and outdated, is being supplanted by a separate series of publications on permits that provide far more detail than can be accommodated in this document. This series should be complete, or nearly so, by the time this revision has been published. In addition, the Ornithological Council members are from or work in countries throughout the Western Hemisphere. We intend to provide detailed permit information for every country in the Western Hemisphere on BIRDNET, the Ornithological Council [Permits](#) webpage.

### ***Outcome-oriented approach***

These Guidelines are outcome-oriented. The intent is to examine the kinds of impacts that result from research methods, with the goal of eliminating or minimizing those impacts. Researchers should always strive to use the method that eliminates or reduces impact to the maximum extent, consistent with the purpose of the research. In other words, we advocate the consistent application of the refinement principle: choose methods to lessen or eliminate stress, pain and suffering, and to make the animals more comfortable. This refinement principle is one of the “3 Rs” that became the touchstone of animal research after publication of *The Principles of Humane Experimental Technique* (Russell and Burch 1959). Based on a scientific study of humane technique pertaining to research involving laboratory animals, the first principle calls for

**replacement**, which has, in recent years, come to mean replacement with non-animal models such as cells, tissue culture, and computer-based models. This principle has been of some practical application in biomedical research. In wildlife research, of course, animals studied are the objects of the research rather than the subjects. Replacement is rarely an option in wildlife research. Animal ecologists have modeled some aspects of behavioral ecology but at some point, hypotheses developed with models are field-tested to determine the extent to which the model explains behavior of actual animals. When studying endangered species, closely related species are sometimes used. Generally, though, replacement is not an option in wildlife biology.

**Reduction** – the second principle – calls for methods for obtaining comparable levels of information from the use of fewer animals in scientific procedures or for obtaining more information from a given number of animals so that fewer animals are needed to complete a given research project. The number of animals used should be the minimum that is consistent with the aims of the experiment. Achieving this end requires careful statistical planning. Those who lack adequate training in biostatistics would need to consult with a biostatistician to determine the appropriate number of animals or samples needed for the study. A study with an inadequate sample size that results in the failure of the study or a study that can't be completed or published has actually increased the number of animals used in research without a gain in knowledge. The third principle – **refinement** – entails the use of methods that alleviate or minimize potential pain and distress and that enhance animal well-being. Refinement should be the guiding paradigm for all wildlife research, which entails choosing the method that will generate the information needed while alleviating or minimizing negative impacts. So, for instance, this might entail a reduction in handling time or the selection of alternate means to obtain material for genetic sampling.

We provide peer-reviewed information about methods to achieve outcomes based on the refinement principle. We do not identify best practices, because research conditions – particularly in field settings - vary greatly, the physiology and behavior of bird species varies greatly, and the purpose of the research may require the use of a particular technique and so no one method or technique is suitable in all circumstances. Where appropriate, we identify practices that require exceptional justification.

Due to the considerable anatomical, behavioral, and physiological diversity of the birds species, and to the fact that usually the investigator will be an authority on the requirements and tolerances of the species under study, ultimate responsibility for certain techniques or procedures may best be left to the investigator. This approach is consistent with that taken by

the Guide to the Care of Use of Laboratory Animals (ILAR Guide), published by the National Research Council. The ILAR Guide “charges users of research animals with the responsibility of achieving specified outcomes” but leaves it to the researcher to determine how best to achieve that outcome. As the ILAR Guide says, this “performance approach is desirable because many variables (such as the species and previous history of the animals, facilities, expertise of the people, and research goals) often make prescriptive approaches impractical and unwarranted.” The performance-based standard necessarily relies upon the professional judgment of the researcher. In these *Guidelines*, then, we report research-based discussion of various methods for the purpose of providing the researcher with the knowledge needed to exercise professional judgment, but the inclusion of a method does not imply that it is appropriate for a given species, set of circumstances, or research questions. Conversely, the omission of discussion of a method does not imply that it is not acceptable. More likely, an omission signifies only the absence of published information. An Institutional Animal Care and Use Committee requires justification of the choice of a particular method, whether it is considered a “standard” method, a variant of a standard method, or a newly developed method.

Most of the scientific papers discussed in the text describe methods, and we provide a resource list that includes many references on field techniques but this Guide is not intended to be a complete reference on techniques and procedures.

### ***Practical limitations and general guidance for application***

These Guidelines include current information about techniques relevant to birds and policies relevant to ornithological research. Advances in methods and changes to policy will require future amendments. For that reason, these Guidelines will be supplemented continually through updates (on BIRDNET) as needed. The Ornithological Council will maintain a literature database accessible to individual members of the member societies of the Ornithological Council and to members of Institutional Animal Care and Use Committees and officials of federal and state agencies upon request.

The Ornithological Council will provide the text of Guidelines free of charge and will make a Spanish translation available. We hope to provide other translations if possible.

The Ornithological Council encourages members of Institutional Animal Care and Use Committees to contact the Ornithological Council for information about specific research methods and for referrals to ornithologists with expertise as to specific methods and species.

Discussion of policy and procedure focuses on the United States. Seven of the eleven member societies of the Ornithological Council are based in the United States; though some are international in scope and the members of these scientific societies study birds everywhere in the world. When they conduct research in the United States or receive funding from a federal agency, even if the research takes place outside the United States, they must comply with United States law. The system of statutes, regulations, and procedures in the United States that mandate the scrutiny of research involving animals is perhaps the most elaborate and rigorous in the Western Hemisphere. The basic principles of animal welfare - particularly the reduction, replacement, and refinement principles - are universal, as is the science.

## **B. Regulatory agencies and other organizations**

### ***United States***

Government frameworks for the agencies and organizations that regulate or oversee ornithological research vary from one country to another. In the United States, four federal agencies and fifty state agencies oversee research on wild birds. The [U.S. Fish and Wildlife Service](#) requires permits pursuant to the mandates of the Migratory Bird Treaty Act or the Endangered Species Act, though the [Bird Banding Laboratory](#) of the U.S. Geological Survey issues permits for bird marking. Nearly all of the fifty states require permits for research involving wild birds. The federal and state laws implemented by these agencies are intended to protect bird populations, though the permit regulations in the United States allude very briefly to humane conditions for live wildlife possessed under a permit. Substantial detail about permitting requirements is provided on [BIRDNET](#).

The Animal Welfare Act, as initially enacted by Congress in 1970 (P.L.91-579) and later amended in 1976 (P.L.94-279) and now codified in the U.S. Code at 7 U.S.C. 2131 *et seq.* is intended to “insure that animals intended for use in research facilities or for exhibition purposes or for use as pets are provided humane care and treatment.” The U.S. Department of Agriculture, Animal and Plant Health Inspection Service [Animal Care](#) program implements this law by issuing and enforcing regulations (9 C.F.R. 2.1 *et seq.*). As explained more fully below,

the regulations do not, at the time of this revision, apply to birds. The Animal Care program is in the process of developing regulations for research pertaining to birds. These regulations likely will be proposed in early 2010 for public comment.

Under the Health Research Extension Act of 1985 (P.L. 99-158, codified at 42 U.S.C.289d), the director of the National Institutes of Health established guidelines for the proper care and use of animals used in biomedical and behavioral research. Though this statute and the guidelines do not apply to most ornithological research, universities adhere to these guidelines and apply them to all research involving live vertebrates because to maintain eligibility to receive grants and contracts from the National Institutes of Health, they must agree to do so. The policy, known as the [Public Health Service Policy on Humane Care and Use of Laboratory Animals](#), is overseen by the [Office of Laboratory Animal Welfare of the National Institutes of Health](#). Other federal funding agencies, such as the National Science Foundation, voluntarily adhere to these standards and compliance is a condition of receiving grants.

The Animal Welfare Act (and its implementing regulations) varies in some respects from the Health Research Extension Act and the Public Health Service Policy, primarily with regard to procedural requirements. To avoid conflict and duplication, the U.S. Department of Agriculture and the National Institutes of Health have, by agreement, assigned oversight of research issues to the National Institutes of Health.

In the United States, federal agencies adhere to an interagency policy known as the U.S. [Government Principles](#) for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training. These principles govern the use of animals in research conducted by federal agencies.

The [Institute of Laboratory Animal Research](#) of the National Research Council publishes the [Guide for the Care and Use of Laboratory Animals](#) (*ILAR Guide*), a leading guidance document that elaborates upon the underlying philosophy and basic principles for appropriate care of research animals. This *Guide* discusses field investigations in a very cursory manner, but is nonetheless used by Institutional Animal Care and Use Committees in assessing research protocols for field studies. At the time of this revision, the *Guide* itself was undergoing revision. The Institute, which also publishes a quarterly [journal](#), has no oversight or regulatory functions

## **Canada**

The [Canadian Wildlife Service](#) implements that country's Migratory Birds Convention Act; the [Bird Banding Office](#) of the issues permits for marking birds and the provincial and territorial offices issue permits for other research activities.

In Canada, oversight of animal welfare in research falls to the [Canadian Council on Animal Care](#). This non-governmental organization was created when the Medical Research Council of the Canadian Institutes of Health requested that the National Research Council (the Government of Canada's premier organization for research) establish a committee to investigate the care and use of experimental animals in Canada. In 1968, following the Committee's recommendation to create a voluntary control program exercised by scientists in each institution, subject to peer review and committed to implementing the guiding principles of an independent advisory body, the Canadian Council on Animal Care (Canadian Council on Animal Care) was established. The Canadian Council on Animal Care was incorporated as a non-profit, autonomous and independent body in 1982. It receives most of its funding from the Canadian Institutes of Health Research (CIHR) and the Natural Sciences and Engineering Research Council (NSERC), with additional contributions from federal science-based departments and private institutions.

The Canadian Council on Animal Care mission statement underlines the focus of the organization on the ethical principles of animal-based experimentation:

The purpose of the Canadian Council on Animal Care is to act in the interests of the people of Canada to ensure through programs of education, assessment and persuasion that the use of animals, where necessary, for research, teaching and testing employs optimal physical and psychological care according to acceptable scientific standards, and to promote an increased level of knowledge, Animal Welfare Act, and sensitivity to relevant ethical principles.

The Canadian Food Inspection Agency enforces the regulations through routine inspections, unannounced site inspections and response to reports of non-compliance. Federal and provincial laws prohibit cruelty to animals; most entail criminal sanctions.

### ***Private organizations***

Private organizations also play a role in assuring the welfare of animals studied in scientific research. Principle among them is the [Association for the Assessment and Accreditation of Laboratory Animal Care International](#). Virtually all U. S. academic and research institutions belong to this organization and seek accreditation by meeting its exacting standards. It is the only private accrediting organization recognized by the Public Health Service of the U.S. Department of Health and Human Services. The [Scientists Center for Animal Welfare](#) and [PRIM&R](#) (Public Responsibility in Medicine and Research; its membership arm known as the Applied Research Ethics National Association is now fully subsumed into PRIM&R) are membership organizations that advance ethical standards in the conduct of research involving live animals through training, workshops, and publications.

### ***International organizations***

Efforts to develop international, harmonized standards for the care and treatment of animals used in research are underway. The [International Council for Laboratory Animal Science](#) dates to 1955, when the International Union of Biological Sciences appointed an international committee to study the problems that existed within those scientific fields in which live animals were used in experimental procedures. Later that year the United Nations Educational, Scientific and Cultural Organization requested information on the production and use of laboratory animals in various countries. These two initiatives resulted in agreement to establish an independent non-governmental scientific committee with the aim to raise the standards in the use of laboratory animals on a global basis. It was in this way and under the auspices of these two organizations that the International Council for Laboratory Animal Science was established in 1956. The Ornithological Council joined this international body in 2007 to represent scientific ornithology because so many of the members of the societies that comprise the Council conduct their research outside the United States. To date, the International Council for Laboratory Animal Science has focused primarily on biomedical research and on oversight procedures rather than substantive standards, but in anticipation of the eventual inclusion of field biology, the Ornithological Council seeks to become an authoritative source of information for this and other, similar multinational efforts.

## **C. The oversight of research involving animals: legal basis and implementation**

### ***United States***

In the United States, protection of animals studied in research is overseen by Institutional Animal Care and Use Committees, who derive their authority from two sources: the Animal Welfare Act (7 U.S.C. 2131 *et seq.*) and the Health Research Extension Act of 1985 (P.L. 99-158) which amended the Public Health Service Act and is now codified at 42 U.S.C. 289(d). When first enacted in 1966, the Animal Welfare Act established a system for inspection of facilities that bred or sold animals for research and of the research labs. Over time, it was amended to include oversight of research methods. The terms of the statute give it very broad and comprehensive application:

“The term “research facility” means any school (except an elementary or secondary school), institution, or organization, or person that uses or intends to use live animals in research, tests, or experiments, and that (1) purchases or transports live animals in commerce, or (2) receives funds under a grant, award, loan, or contract from a department, agency, or instrumentality of the United States for the purpose of carrying out research, tests, or experiments...” The Public Health Service Act required the Director of the National Institutes of Health to establish guidelines for the proper care and treatment of animals used in research and also required that every institution receiving funding from the National Institutes of Health to assure that agency that it would comply with those guidelines. In 1986, the National Institutes published those guidelines, known as the [Public Health Service Policy on Humane Care and Use of Laboratory Animals](#). These guidelines, since updated at least twice, require that “In order to approve proposed research projects or proposed significant changes in ongoing research projects, the Institutional Animal Care and Use Committee shall conduct a review of those components related to the care and use of animals and determine that the proposed research projects are in accordance with this Policy. In making this determination, the Institutional Animal Care and Use Committee shall confirm that the research project will be conducted in accordance with the Animal Welfare Act insofar as it applies to the research project, and that the research project is consistent with the [ILAR] Guide [to the Care and Use of Laboratory Animals] unless acceptable justification for a departure is presented.”

Other federal agencies that fund research adopted these rules on a voluntary basis. For instance, the National Science Foundation [Award and Administration Guide](#) provides that:

Any grantee performing research on vertebrate animals shall comply with the Animal Welfare Act [7 U.S.C. 2131 et seq.] and the regulations promulgated thereunder by the Secretary of Agriculture [9 CFR 1.1-4.11] pertaining to the humane care, handling, and treatment of vertebrate animals held or used for research, teaching or other activities supported by Federal Animal Welfare Act. The Animal Welfare Act is expected to ensure that the guidelines described in the National Academy of Science (NAS) [ILAR] Publication, "*Guide for the Care and Use of Laboratory Animals*" (1996) are followed and to comply with the *Public Health Service Policy and Government Principles Regarding the Care and Use of Animals* (included as Appendix D to the NAS Guide).

The [National Science Foundation Grant Proposal Guide](#) provides that:

Any project proposing use of vertebrate animals for research or education shall comply with the Animal Welfare Act [7 U.S.C. 2131 et seq.] and the regulations promulgated thereunder by the Secretary of Agriculture [9 CFR 1.1-4.11] pertaining to the humane care, handling, and treatment of vertebrate animals held or used for research, teaching or other activities supported by Federal awards. In accordance with these requirements, proposed projects involving use of any vertebrate animal for research or education must be approved by the submitting organization's Institutional Animal Care and Use Committee (Institutional Animal Care and Use Committee) before an award can be made. For this approval to be accepted by NSF, the organization must have a current Public Health Service (PHS) Approved Assurance.

The Departments of Defense, the National Aeronautic and Space Administration, the U.S. Department of Agriculture, and other grant-making agencies have similar policies.

Technically, then, if a research project does not involve the transport or purchase of animals across state lines, and if the facility receives no federal funding, then the Animal Welfare Act is not applicable. In that case, while ornithologists or research facilities may not need to follow the procedural mandates of the Animal Welfare Act, they should still adhere to the principles of appropriate care and use. These facilities might also want to consider establishing a review board of the nature of an Institutional Animal Care and Use Committee, with one or more scientists unaffiliated with the facility assessing the research protocols used by the researchers of that facility. The absence of federal requirements should be considered as no more than an

absence of paperwork and reporting burdens, but the basic review procedures and substantive standards established by the Animal Welfare Act regulations and by documents such as these *Guidelines* should be considered best practices. A research organization would be well advised to document its self-proscribed procedures and its adherence to those procedures to assure itself and its staff, supporters, and the public that it takes seriously its commitment to the appropriate care and use of the animals studied by its researchers.

Some research facilities that are not legally subject to the requirements of the Animal Welfare Act and the Public Health Service Act have investigated the possibility of asking the Institutional Animal Care and Use Committee of nearby universities or other research organizations to review their research protocols. Most universities are unwilling to do so, in part because their own committees, comprised of volunteers, are already overtaxed. Universities and other research organizations also shy from accepting this responsibility because they are required to provide a formal “assurance” document to the National Institutes of Health ([Office of Laboratory Animal Welfare](#)) committing to adhere to and implement numerous laws, regulations, and policies, including review of research protocols, facilities inspections, record-keeping, and reporting requirements. Eligibility for funding from the Public Health Service of the U.S. Department of Health and Human Services is conditioned upon fulfillment of the assurance. A university or research organization, having no authority or oversight over another organization, would not want to risk its eligibility for federal funding by voluntarily accepting any level of responsibility for the activities of that organization.

### ***Are birds covered?***

Ornithologists in the United States know that their research has always been regulated, notwithstanding the fact that research involving birds – wild, captive, or bred-in-captivity, is not covered by the Animal Welfare Act or the implementing regulations, though regulations likely will be promulgated by 2009. The regulation of ornithological research in the United States stems from the policies of the Public Health Service, which cover all live vertebrates, and that determine eligibility for federal research funding.

The Animal Welfare Act (Animal Welfare Act) as originally enacted in 1966 (P.L. 89-544) did not include birds. The 1970 amendments (P.L.91-579) defined animals to be covered under the Animal Welfare Act as “any live or dead dog, cat, monkey (nonhuman primate mammal), guinea

pig, hamster, rabbit, or such other warm-blooded animal, as the Secretary may determine is being used, or is intended for use, for research, testing, experimentation, or exhibition purposes..." Until 1998, the regulations issued by the Secretary of Agriculture excluded rats, mice, and birds from Animal Welfare Act implementation. Litigation filed by an animal welfare organization prompted the Secretary of Agriculture to announce that these taxa would be included and that the Animal and Plant Health Inspection Service would issue implementing regulations. Subsequent legislative directives enacted by Congress halted that process by amending the Animal Welfare Act to made permanent the exclusion of rats, mice, and birds (Pub. L. 107-171, Section 10301), now codified at 42 U.S.C. 2131(g) as follows:

(g) The term "animal" means any live or dead dog, cat, monkey (nonhuman primate mammal), guinea pig, hamster, rabbit, or such other warm-blooded animal, as the Secretary may determine is being used, or is intended for use, for research, testing experimentation, or exhibition purposes, or as a pet; but such term excludes (1) birds, rats of the genus *Rattus*, and mice of the genus *Mus*, bred for use in research...

This provision was intended to codify the original regulation promulgated by the Department of Agriculture to exclude rats, mice, and birds. Unfortunately, a printer's error, in the form of an insertion of a comma prior to the word "bred" caused the Animal and Plant Health Inspection Service Animal Care staff to interpret the new statutory language to mean that the condition "bred for use in research" applied to birds as well as rats and mice. The USDA then prepared to promulgate regulations accordingly. The Ornithological Council sought to have this error corrected by way of a revision in the 2007 Farm Bill; counsel for the Senate Agriculture Committee agreed that it had been a printer's error and should be corrected. Despite strenuous efforts by the Ornithological Council, the Congress declined to correct this error. The USDA will now proceed to draft new regulations pertaining to research involving wild birds, whether studied in the field or the lab. The proposed regulation should be published for comment in 2010.

*The Ornithological Council believes strongly that birds, both wild and captive-bred, should be treated humanely, both in the laboratory and in research conducted in the wild. It is for this reason that we publish this peer-reviewed Guidelines to the Use of Wild Birds in Research. Our objection to the inclusion of birds in the Animal Welfare Act regulations is based solely on the fact that it is likely to impose additional burdens on research without producing an*

*improvement in the humane treatment of birds, because, as explained below, this research is already regulated under the Health Research Extension Act of 1985, which makes the Animal Welfare Act applicable to all vertebrates. We object only to duplicative and potentially conflicting sets of regulations and burdensome procedural compliance, without contributing to the humane treatment of birds in research.*

### **Are field studies covered?**

The Animal Welfare Act regulations define “field study” as a study conducted on free-living wild animals in their natural habitat. Under the implementing regulations, this definition excludes any study that involves an invasive procedure, harms, or materially alters the behavior of an animal under study” (9 CFR 1.1). The U.S. Department of Agriculture has declined to define the terms “invasive procedure,” “harms,” and “materially alters the behavior.” Read broadly, only purely observational studies would constitute field studies.

Field studies are, under the Animal Welfare Act regulations [9 CFR 2.31(c)(2) and 9 CFR 2.31(d)] exempt from the site inspection and protocol review procedures. However, ornithologists will nearly certainly find that their institutions require review of all studies, even class bird walks. Ornithologists should understand that institutions receiving federal funding are required under the PHS policy to “assure” that *all* of the institution’s programs and facilities have been evaluated. To comply with the terms of the “assurance” the institution must require that all protocols be submitted, even if the specific study methods are not further evaluated. Also note that the PHS policy does not exclude field study. According to the Office of Laboratory Animal Welfare:

If the activities are PHS-supported and involve vertebrate animals then the Institutional Animal Care and Use Committee is responsible for oversight in accord with PHS Policy. Institutional Animal Care and Use Committees must know where field studies will be located, what procedures will be involved, and be sufficiently familiar with the nature of the habitat to assess the potential impact on the animal subjects. Studies with the potential to impact the health or safety of personnel or the animal’s environment may need Institutional Animal Care and Use Committee oversight, even if described as purely observational or behavioral. When capture, handling, confinement, transportation, anesthesia,

euthanasia, or invasive procedures are involved, the Institutional Animal Care and Use Committee must ensure that proposed studies are in accord with the Guide for the Care and Use of Laboratory Animals (the “ILAR Guide”). The Institutional Animal Care and Use Committee must also ensure compliance with the requirements of pertinent state, national and international wildlife regulations.

The [National Science Foundation Award and Administration Guide](#) expressly includes field study without defining the term: “The grantee is responsible for the humane care and treatment of any vertebrate animal used or intended for use in such activities as field or laboratory research, development, training, experiments, biological testing or for related purposes supported by NSF grants.”

Discussions of the legality of authority over field studies are largely irrelevant. The respectful and ethical treatment of animals does not depend on legality. And in practice, research institutions require the submission for review and approval of all research protocols. Ornithologists sometimes chafe about being required to submit protocols for purely observational work, such as point counts and song recording – or even bird walks for students, which involve no research whatsoever. Realize that the institution is taking measures that it perceives to be necessary to comply with the terms of its assurance to the National Institutes of Health, and thus to maintain its eligibility for federal funding. The purpose of requiring review of proposals for purely observational work is to assure that in fact the work is observational in nature and that no further review is needed. Unless the protocol is submitted for review, the research institution cannot know what research is being conducted. However, the purpose of these reviews is to determine that no further review is needed; there is rarely additional scrutiny.

Generally, these agencies and the Institutional Animal Care and Use Committees do not require inspection of field study sites, partly because it would be impractical, if not impossible, to send Institutional Animal Care and Use Committee members to field sites, which may be very distant from the university and that may not be stationary. Furthermore, study site inspection is, under the regulations, limited to “any building room, area, enclosure, or other containment outside of a core facility or centrally designated or managed area in which animals are housed for more than 12 hours.” Researchers should know, however, that universities often regard these mandates as minimum standards and not as constraints, and so frequently require more of the researcher than the law suggests. So, for instance, some Institutional Animal Care and Use Committees ask researchers to carry videotape equipment into the field to record one or more actual

procedures. This request may be burdensome, in that researchers may not have enough field assistants to carry additional equipment and to videotape procedures. Researchers may want to consider proposing alternative demonstrations, such as a mist-netting and banding demonstration in an area near the campus.

### ***Application of the Animal Welfare Act outside the United States***

Researchers receiving funding from an agency of the United States government, or working at institutions that receive federal funding should note that even if research takes place outside the United States, protocol review and approval by the Institutional Animal Care and Use Committee. The Grant Policy of the National Science Foundation expressly provides that, "(iv) awards to U.S. grantees for projects involving the care or use of vertebrate animals at a foreign institution or foreign field site also require approval of research protocols by the U.S. grantee's Institutional Animal Care and Use Committee. If the project is to be funded through an award to a foreign institution or through an individual fellowship award that will support activities at a foreign institution, NSF will require a statement of compliance that the activities will be conducted in accordance with all applicable laws in the foreign country and that the [International Guiding Principles for Biomedical Research Involving Animals](#) will be followed." See "[Vertebrate Animals](#)" in the National Institutes of Health Animal Award and Administration Guide. The [Public Health Service Policy on the Humane Care and Use of Laboratory Animals](#) issued by the National Institutes of Health provides that, "This Policy is applicable to all PHS-conducted or supported activities involving animals, whether the activities are performed at a PHS agency, an awardee institution, or any other institution and conducted in the United States, the Commonwealth of Puerto Rico, or any territory or possession of the United States. Institutions in foreign countries receiving PHS support for activities involving animals shall comply with this Policy, or provide evidence to the PHS that acceptable standards for the humane care and use of the animals in PHS-conducted or supported activities will be met. No PHS support for an activity involving animals will be provided to an individual unless that individual is affiliated with or sponsored by an institution which can and does assume responsibility for compliance with this Policy, unless the individual makes other arrangements with the PHS."

## ***Overview of the Institutional Animal Care and Use Committee system***

The Public Health Service Policy on Humane Care and Use of Laboratory Animals requires that all institutions subject to the Policy (those receiving funding from the National Institutes of Health; as noted above, other federal funding agencies have adopted this same policy) establish an Institutional Animal Care and Use Committee consisting of five members including a veterinarian, a scientist experienced with animal research, a nonscientist (such as a lawyer, an ethicist, or a member of the clergy), and an individual who is not affiliated with the institution in any way. The Institutional Animal Care and Use Committee must review all protocols for research supported by agency funding to “ confirm that the research project will be conducted in accordance with the Animal Welfare Act insofar as it applies to the research project, and that the research project is consistent with the Guide unless acceptable justification for a departure is presented. The regulations (9 CFR 2.31) that implement the Animal Welfare Act establish the specific issues to be considered by the Institutional Animal Care and Use Committee in reviewing research protocols. These considerations, which may not be applicable in some field research situations, are as follows:

- a. Procedures involving animals will avoid or minimize discomfort, distress, and pain to the animals, consistent with sound research design.
- b. The principal investigator has considered alternatives to procedures that may cause more than momentary or slight pain or distress to the animals, and has provided a written narrative description of the methods and sources used to determine that alternatives were not available;
- c. The principal investigator has provided written assurance that the activities do not unnecessarily duplicate previous experiments;
- d. Procedures that may cause more than momentary or slight pain or distress to the animals will:
  - (1) Be performed with appropriate sedatives, analgesics or anesthetics, unless withholding such agents is justified for scientific reasons, in writing, by the principal investigator and will continue for only the necessary period of time;

(2) Involve, in their planning, consultation with the attending veterinarian or his or her designee;

(3) Not include the use of paralytics without anesthesia;

e. Animals that would otherwise experience severe or chronic pain or distress

that cannot be relieved will be painlessly killed at the end of the procedure or, if appropriate, during the procedure.

f. The living conditions of animals will be appropriate for their species and contribute to their health and comfort. The housing, feeding, and nonmedical care of the animals will be directed by a veterinarian or other scientist trained and experienced in the proper care, handling, and use of the species being maintained or studied.

g. Medical care for animals will be available and provided as necessary by a qualified veterinarian.

h. Personnel conducting procedures on the species being maintained or studied will be appropriately qualified and trained in those procedures.

i. Activities that involve surgery include appropriate provision for pre-operative and post-operative care of the animals in accordance with established veterinary medical and nursing practices. All survival surgery will be performed using aseptic procedures, including surgical gloves, masks, sterile instruments, and aseptic techniques. Major operative procedures on non-rodents will be conducted only in facilities intended for that purpose which shall be operated and maintained under aseptic conditions. Non-major operative procedures and all surgery on rodents do not require a dedicated facility, but must be performed using aseptic procedures. Operative procedures conducted at field sites need not be performed in dedicated facilities, but must be performed using aseptic procedures.

j. No animal will be used in more than one major operative procedure from which it is allowed to recover, unless:

(1) Justified for scientific reasons by the principal investigator, in writing;

(2) Required as routine veterinary procedure or to protect the health or well-being of the animal as determined by the attending veterinarian; or

(3) In other special circumstances as determined by the Administrator on an individual basis. Written requests and supporting data should be sent to the Animal and Plant Health Inspection Service, Animal Care, 4700 River Road, Unit 84, Riverdale, Maryland 20737-1234;

k. The humane destruction of an animal accomplished by a method that produces rapid unconsciousness and subsequent death without evidence of pain or distress, or a method that utilizes anesthesia produced by an agent that causes painless loss of consciousness and subsequent death, unless a deviation is justified for scientific reasons, in writing, by the investigator. In practice, methods of euthanasia consistent with the recommendations of the American Veterinary Medical Association (AVMA) [Panel on Euthanasia](#) are considered acceptable.

Significant changes to ongoing research must also be reviewed and approved.

To these considerations, the Ornithological Council suggests that ornithologists also consider these issues when developing their research protocols

- a. Taxa chosen should be well-suited to answer the question(s) posed.
- b. The investigator must have knowledge of all regulations pertaining to the animals under study and must obtain all permits necessary for carrying out proposed studies in the country where the research is to be conducted. Authors should include in all published papers, reports, and presentations a statement that the necessary permits were obtained.
- c. Before initiating field research, investigators must be familiar with the study species and its response to disturbance, sensitivity to capture and restraint, and, if necessary, requirements for captive maintenance to the extent that these factors are known and are applicable to a particular study. Removal from the wild of adults that may be tending nests, chicks, or dependent fledglings should, as a general principle, be avoided unless justified for scientific reasons.
- d. Studies should use the fewest animals necessary to reliably answer the questions posed. An adequate sample size will prevent unnecessary repetition of the study, thus avoiding additional impacts on wild birds.
- e. Every effort should be made prior to removal of animals to understand the population

status of the taxa to be studied. The number of individuals removed from the wild must be kept to the minimum determined by the investigator to be necessary to accomplish the goals of the study. This statement should not be interpreted as discouraging study or collection of uncommon species. Collection for scientific study can be crucial to understanding why a species is not abundant. This issue is discussed in more detail in the section on Scientific Collecting.

f. Procedures that are likely to have lasting effects on populations should be undertaken with caution. Except in the most extraordinary circumstances, procedures likely to affect the stability or existence of a population are proscribed. In such instances, the investigator must demonstrate the concurrence of recognized experts that the procedure is necessary.

g. Researchers should plan to salvage birds where accidental mortality occurs, for deposit as specimens in museums or teaching collections. The usefulness of specimens should be maximized by saving as much material as possible, including skins, carcasses, skeletons, fluids, tissues, and DNA samples. Researchers should learn methods for preserving and labeling specimens and should have the necessary materials and equipment available.

h. The principal investigator must ensure that all personnel associated with the project have been properly trained. Students and technicians must be required to ask questions and seek assistance. Anyone wishing to use an unfamiliar technique must seek advice from an expert and, if possible, to visit that expert and practice the technique under the guidance of the expert. Appropriate expertise may be found in the academic and wildlife management communities, the zoo and aquarium communities, and among aviculturists.

### ***Standards of review for field studies: a note for ornithologists***

Most guidance available to Institutional Animal Care and Use Committees pertains primarily to biomedical research or research in the controlled environment of a laboratory. The Institute for Laboratory Animal Research of the National Research Council of the National Academies of Science publishes the [Guide for the Care and Use of Laboratory Animals](#). As the title suggests, the discussion pertaining to wild animals studied in the field or in the laboratory is minimal. Nonetheless, this resource, together with the [Institutional Animal Care and Use Committee](#)

[Guidebook](#) published jointly by the Applied Research Ethics National Association and the Office of Laboratory Animal Welfare of the National Institutes of Health is the primary source of standards and guidance for Institutional Animal Care and Use Committees. This Guidebook, which suggests that Institutional Animal Care and Use Committees consult relevant experts, alludes to these Guidelines and to the Ornithological Council. Ornithologists are encouraged to ask Institutional Animal Care and Use Committee members to consult with the Ornithological Council should the Institutional Animal Care and Use Committee desire additional information about a proposed research method; we will refer them to ornithologists with relevant expertise and provide literature and other information as may be available.

For various reasons, field biologists rarely serve on Institutional Animal Care and Use Committees. As a result, it is often necessary for the ornithologist to help Institutional Animal Care and Use Committee members to understand the nature of research in field conditions. In addition, the ornithologist should be prepared to provide evidence – from these *Guidelines* and the supporting literature – of the known impacts (or lack of impacts) of field research methods. In other words, the ornithologist should regard the protocol review as an opportunity to impart information and to educate. Approaching the protocol review as an adversarial proceeding serves no purpose, and is generally detrimental.

The Ornithological Council strongly encourages field biologists to serve on these committees, which are intended to allow scientific research to be assessed through a peer review system. If field biologists do not serve, there may be no committee members who have the expertise to serve as true peers.

### ***Standards of review for field studies: a note for Institutional Animal Care and Use Committees***

Field biology takes place in uncontrolled and usually uncontrollable environments that differ drastically from laboratory work. The Institutional Animal Care and Use Committee must necessarily consider procedures and techniques that are practical for implementation at the site of the research. Prevailing conditions may prevent investigators from following even these *Guidelines* to the letter at all times. Investigators must, however, make a good faith effort to follow the spirit of these *Guidelines* and to justify deviations when they can be foreseen. The omission from these *Guidelines* of a specific research or husbandry technique (or their

application to particular species) must not be interpreted as proscription of the technique. Vertebrates typically used in laboratory research represent a small number of species with well understood husbandry requirements. By contrast, the class Aves contains at least 10,000 species with very diverse and often poorly known behavioral, physiological, and ecological characteristics. This diversity, coupled with the diversity of field research situations, requires that each project be judged on its own merits. Techniques that are useful and fitting for one taxon, experiment, or field situation may be less useful in another time, place, or design. Therefore, in most cases it is impossible to generate specific guidelines for groups larger than a few closely related species. The stipulation of specific guidelines could actually inhibit humane care, as well as research, by imposing inappropriate requirements. Further, the assessment of stress in field situations is a complex issue. Animals behave in ways that promote their own survival or the survival of their own genes, often in ways that appear "cruel." Furthermore, people of good will may evaluate a situation quite differently (compare Bekoff 1993 with Emlen 1993).

When studies on wild birds are to be reviewed, the Institutional Animal Care and Use Committee should attempt to include personnel who understand the nature and impact of the proposed field investigation, the housing of the species to be studied, and knowledge concerning the risks associated with maintaining certain species of wild birds in captivity. Each Institutional Animal Care and Use Committee should, therefore, attempt to include at least one institution-appointed member who is experienced in wildlife biology. Such personnel may be appointed to the committee on an ad hoc basis to provide necessary expertise. When sufficient personnel with the necessary expertise in this area are not available within an institution, a consultant qualified to address these issues should be requested by the Institutional Animal Care and Use Committee, though such consultants are not permitted to vote. The Ornithological Council is willing and able to identify experts for consultation with Institutional Animal Care and Use Committees.

### ***Population-level impacts***

A particular subject of concern involves oversight of the impact of the proposed research at the population level. There is no legal authority for the assessment of population-level impacts by Institutional Animal Care and Use Committees. Neither the Animal Welfare Act nor the Public Health Research Extension Act of 1985, nor the regulations or policies issued pursuant to those statutes, mention population-level impacts. Nonetheless, there is no official recognition or

acceptance by government agencies, private organizations, or individual Institutional Animal Care and Use Committees, that there is no need or authority for the assessment of population-level impacts. To the contrary, questions about population impact are routinely asked.

To address this situation, the Ornithological Council has organized meetings and participated in training programs for agency officials and members of Institutional Animal Care and Use Committees to impart information about permit requirements and to assure these oversight entities that the permit systems that implement the Migratory Bird Treaty Act and the Endangered Species Act, as well as state laws, are intended to address population impacts. The issuance of permits by the U.S. Fish and Wildlife Service, the U.S. Bird Banding Laboratory of the U.S. Geological Survey, and state agencies signifies that these agencies – who possess the expertise to make such assessments – have determined that the permitted activity will not affect bird populations or that any such impacts are merited by the need for the scientific information that will be generated. When the Applied Research Ethics National Association (now known as Public Responsibility in Research & Medicine) revised its Institutional Animal Care and Use Committee Guidebook, the editors graciously included submission of text by the Ornithological Council explaining the permit requirements and the significance of the issuance of permits. That guidance specifically states that:

The investigator should provide information on the population to be studied and a rationale for choosing that particular population. The U.S. Fish and Wildlife Service (USFWS) issues many of the necessary permits. In issuing permits, the USFWS assesses the risk to the animal population and the Institutional Animal Care and Use Committee may rely on that assessment rather than attempt to determine the potential impact to the population. With regard to small or declining populations, many state wildlife or natural resource agencies also issue research permits. In the event that a state permit is required and has been issued, the Institutional Animal Care and Use Committee may assume that the state agency has assessed the risk to the population and found it to be acceptable. An Institutional Animal Care and Use Committee that has additional questions about the selection of species or the impact on the population to be studied may require the investigator to provide additional information or the Committee may consult with biologists with relevant expertise.

It is difficult to determine population-level impacts. On a practical level, it may be impossible to make an assessment because:

- in the wild, it is difficult, if not impossible, to assess the size of a local population, even with time-consuming surveys (even in the unlikely event that the researcher has adequate funding to conduct such surveys)
- in some cases, the ability to detect impacts requires the use of the same methods that are to be used in the study itself; for instance, to determine the impact of capture and marking requires that individuals be captured and marked as it is otherwise impossible to identify individuals in the field. Capturing, marking, and holding in captivity is not an adequate substitute to determine the impact of marking methods in the field unless field conditions can be simulated in captivity – an expensive proposition that would also require additional permits. It is also highly unlikely that field conditions could be adequately simulated in a captive holding facility.

The number of individuals typically involved in a single study is highly unlikely to have a population-level impact, even when the study subjects are removed permanently from the population. A 1975 assessment by the U.S. Fish and Wildlife Service (Banks 1979) estimated that the 15,000 birds taken under scientific collecting permits (the deliberate and permanent removal of individuals from the population) between 1969 and 1972 accounted for less than one percent of overall annual avian mortality from direct causes (the deliberate killing of birds, including hunting, depredation control, and other purposes requiring a permit) and a miniscule fraction of mortality from all causes, including collisions with man-made structures and vehicles, accidental poisoning, and oil spills. In recent years, the numbers taken under scientific collecting permits have been considerably lower. A recent analysis of annual reports submitted by holders of scientific collecting permits revealed that the highest number of individuals of any species taken under a scientific collecting permit totaled 183 individuals in a single year. The number of individuals taken in a single year exceeded 100 for only four species, all of them abundant (unpub. analysis by E. Paul; data obtained from mandatory reports submitted to the U.S. Fish and Wildlife Service). All others were taken in numbers below 100 per species. In a draft 1997 policy on scientific collecting, the USFWS recognized that “The numbers of birds collected in the United States for scientific study are extremely low compared with other categories of human-related activities and apparently have had no obvious or significant impact on species or local populations.” Clearly, then, research methods that do not result in the death of an individual or

the removal of a live individual from the population have little or no impact on populations. Obviously, there may be some mortality incidental to research methods. As discussed in pertinent sections below, the mortality rates are extremely low. For instance, as noted in the discussion of capture and marking, the U.S. Bird Banding Laboratory estimates a mortality rate of 1% resulting from mist netting and bird banding.

## **Canada**

The Canadian Council on Animal Welfare oversees the basic system of regulation of the welfare of animals used in research which entails involves the inspection of facilities and the development of standards that are implemented by Animal Care and Use Committees at research institutions. The programs of the Council are deemed to be universal in application, meaning that they apply to all animals used by: i) members, ii) individuals, and iii) employees, agents or owners acting on behalf of organizations or businesses registered or operating in Canada for any of the following purposes:

- \* to investigate or to search carefully for fact or truth in order to produce knowledge about humans and/or animals;

- \* to transfer or to permit the acquisition of knowledge; or, to develop or improve skills;

- \* to use an established or legislated procedure to demonstrate, determine or verify a fact or findings. This includes, but is not limited to: the testing of sera, vaccines, diagnostics or medical/veterinary/biological products or conducting biological tests; performing toxicological or pharmacological procedures; identifying or detecting pregnancy, disease or other physiological conditions, or characteristics other than those used in normal and proper veterinary treatment.

- \* to produce products for the purpose of generating a profit. This includes, but is not limited to: the manufacture of sera, vaccines, diagnostics, or medical/veterinary/biological products; the capture, production or transportation of animals for use in research, teaching, testing or manufacturing; and agricultural quality improvement programs."

Unless an institution holds a valid Canadian Council on Animal Care Certificate of Good Animal Practice<sup>®</sup>, it cannot receive funding from the federal granting Agencies, and contracts issued by the federal government can only be awarded to institutions holding a Canadian Council on Animal Care Certificate of Good Animal Practice.

Legislation in Canada is not identical to the Animal Welfare Act or the Public Health Service Act. As noted above, the Canadian Council on Animal Care is a nongovernmental organization that has no legislative mandate. However, federal legislation in Canada that applies to the use of animals in research includes Section 446 and 447 of the Criminal Code, which protects animals from cruelty, abuse and neglect. The Health of Animals Act defines conditions for the humane transportation of all animals in Canada by all modes of transport. Each province has legislation in the area of animal welfare. In addition, the federal government imposes conditions related to the care and use of experimental animals on recipients of funding from the federal granting Agencies, and on public works and government services.

#### **D. Additional considerations**

##### ***Publication***

Many journals require that authors provide written assurance that the research project was reviewed and approved by an Institutional Animal Care and Use Committee. They may also require written assurance that required permits were obtained and were current throughout the entire research project. Reviewers of submitted papers and journal editors should look for such assurances and inquire of the authors about omissions of this information. Editors should consider the potential ramifications of publishing papers reporting research that was not conducted in compliance with legal and ethical requirements. Likewise, scientific program committee members reviewing submissions for presentations at society conferences may request that similar evidence accompany requests for a place on the program. However, ultimate responsibility remains with each investigator. Whether or not required to do so, researchers should include such written assurances at the conclusion of each manuscript, report, or oral presentation, to assure not only the editors and readers, but also the general public that the conduct of ornithological research meets ethical and legal requirements.

As a matter of good practice, researchers should also provide a copy of the paper to the permitting agency and to the manager of the land unit where the research was conducted.

##### ***The importance of publishing methods papers***

No field ornithology course covers all research methods; many cover little more than field identification, capture and marking, and censusing methods. No advisor knows every research

method or the impacts of every method. The importance of sharing your experiences with various methods – even commonly used methods – cannot be overemphasized. If a researcher observes an impact on the welfare of the animals you study, or experience a problem, but doesn't share that information, others will not be able to avoid that same problem. Conversely, they may avoid something that need not be avoided. Or they may find that their Institutional Animal Care and Use Committees or regulatory agencies are voicing concerns or even denying permission for a particular method, based on incomplete or erroneous information. For instance, a permit biologist may be concerned about the incidence of mortality and leg injuries resulting from plastic color bands placed on a certain passerine species. A review of the literature would reveal that the injury rate was 2.9% and there was no mortality (Haas and Hargover 2003). Were it not for this paper, the agency might have denied the permit, or the Institutional Animal Care and Use Committee might have refused protocol approval. The researcher would learn that the injuries occurred only when two bands were placed on one leg, and could therefore choose to use dual-color ("striped") bands.

## REFERENCES

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