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PERSPECTIVES ON ANIMAL WELFARE LEGISLATION AND STUDY CONSIDERATIONS FOR FIELD-ORIENTED STUDIES OF RAPTORS IN THE UNITED STATES

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ABSTRACT.—Concern for the welfare of animals used in research and teaching has increased over the last 50 yr. Animal welfare legislation has resulted in guidelines for the use of animals in research, but the guidelines can be problematic because they focus on animals used in laboratory and agriculture research. Raptor biologists can be constrained by guidelines, restrictions, and oversight that were not intended for field research methods or wild animals in the wild or captivity. Field researchers can be further hampered by not understanding animal welfare legislation, who is subject to oversight, or that oversight is often provided by a committee consisting primarily of scientists who work with laboratory animals. Raptor researchers in particular may experience difficulty obtaining approval due to use of various species-specific trapping and handling methods. We provide a brief review of animal welfare legislation and describe the basic components and responsibilities of an Institutional Animal Care and Use Committee (IACUC) in the United States. We identify topics in raptor research that are especially problematic to obtaining IACUC approval, and we provide insight on how to address these issues. Finally, we suggest that all raptor researchers, regardless of legal requirements, abide by the spirit of the animal welfare principles. Failure to do so may bring about further regulatory and permitting restrictions.

KEY WORDS: *animal welfare act*; *Institutional Animal Care and Use Committee (IACUC)*; *Public Health Service Policy*; *raptor*; *research.*

PERSPECTIVAS SOBRE LA LEGISLACIÓN RELACIONADA CON EL BIENESTAR ANIMAL Y CONSIDERACIONES DE ESTUDIO PARA TRABAJOS DE CAMPO SOBRE AVES RAPACES EN LOS ESTADOS UNIDOS

RESUMEN.—La preocupación por el bienestar de los animales empleados para investigación y docencia se ha incrementado en los últimos 50 años. La legislación sobre el bienestar animal ha conducido al desarrollo de recomendaciones para el uso de animales en investigación, pero estas recomendaciones pueden ser problemáticos debido a que se enfocan en animales utilizados en investigaciones de laboratorio e investigaciones agrícolas. Los biólogos que estudian aves rapaces pueden verse limitados por recomendaciones, restricciones y políticas de vigilancia que no se desarrollaron teniendo en cuenta los métodos de investigación de campo ni los animales silvestres en condiciones naturales o de cautiverio. Los investigadores de campo también pueden verse impedidos por no entender la legislación sobre el bienestar animal, por no conocer quiénes están sujetos a vigilancia, o porque la vigilancia es ejercida por comités que incluyen principalmente a científicos que trabajan con animales de laboratorio. Los investigadores que trabajan particularmente con aves rapaces pueden encontrarse con dificultades para obtener la aprobación debido a que estos usan varios métodos de captura y manipulación que son específicos para cada especie.

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Presentamos una breve revisión de la legislación sobre el bienestar animal, y describimos los componentes básicos y las responsabilidades de los comités institucionales de cuidado y uso de animales (IACUC, por sus siglas en inglés) en los Estados Unidos. Identificamos tópicos en la investigación de rapaces que son especialmente problemáticos para obtener aprobación de los IACUC y brindamos recomendaciones en cuanto a cómo abordar los asuntos involucrados. Finalmente, sugerimos que todos los investigadores de rapaces, independientemente de los requisitos legales, se ajusten a los principios del bienestar de los animales. El no hacerlo podría acarrear más restricciones regulatorias y de permisos.

[Traducción del equipo editorial]

The study and management of wildlife species often requires the capture of animals to mark or radiotag individuals, to obtain morphological, physiological and genetics data, train graduate students or field workers, or to manipulate populations (Braun 2005). Some studies may experimentally manipulate resources (Dewey and Kennedy 2001) whereas others may be primarily or exclusively observational (Smithers et al. 2005, Gaibani and Csermely 2007). Confusion and misunderstanding as to what legal and ethical aspects of animal welfare issues pertain to the individual researcher, manager, or teacher are common. In response, professional societies have attempted to provide recommendations for the use of wild birds (Fair et al. 2010), wild mammals (Gannon et al. 2007), and other taxa (e.g., American Society of Ichthyologists and Herpetologists 2004) in research. Dein et al. (2005) provided recommendations for care and use of wildlife in field research. However, guidelines for the capture, care, and study of wildlife lack specificity due to the thousands of species and methods, and frequent lack of understanding of individual species' requirements or sensitivities to researcher disturbance (Williams 1999). The lack of specificity may cause frustration for those working with wildlife and attempting to explain their research or education protocols to review committees, and for review committees which often consist primarily of scientists working with laboratory animals with little or no experience conducting field studies (Williams 1999, Dein et al. 2005, Laber and Young 2007).

The recent publication of the Raptor Research and Management Techniques (Bird and Bildstein 2007) updates the Raptor Management Techniques Manual (Giron Pendleton et al. 1987). Issues concerning animal welfare in raptor research and field studies were not addressed in the Raptor Management Techniques Manual (Giron Pendleton et al. 1987), and were only addressed in passing in the recently released Raptor Research and Management Techniques (Bird and Bildstein 2007). This is understandable, as it was beyond the scope of the manual to describe what situations would require protocol review, why such reviews are required, who conducts the reviews, the general process required for approval of field research procedures, or ethical underpinnings for a thoughtful review. We point this out only to emphasize the lack of animal welfare information relevant to raptor research and management. We believe this is especially a concern for those working with raptors, as they are a diverse group consisting of federal or state agency employees, university researchers, independent researchers or rehabilitators, and members of the general public who hold banding permits. Some aspects of raptor research (e.g., live lures, sacrificial bait animals) are especially problematic in the context of animal welfare concerns. An additional concern is that some professional societies may require that documentation of proper animal care and use be provided for publication of research (e.g., Chamberlain and Johnson 2008), and some state permitting processes may be dovetailed with an Institutional Animal Care and Use Committee (IACUC) review (K. Titus pers. comm.). Finally, regardless of individual opinions concerning the values or impediments posed by animal welfare issues, it is important to understand the legal requirements mandated by animal welfare legislation in the United States, as all institutions (and hence, their employees) receiving federal funding for research involving animals, fall under animal welfare legislation and restrictions (Animal Welfare Act, 7 U.S.C. 2131 et. seq., Mulcahy 2003).

Regardless of legal obligations, we suggest that it is beneficial for all people permitted to work with birds of prey to understand animal welfare legislation and requirements. For simplicity, we herein refer to individuals working with raptors as 'researchers.' All researchers are subject to public scrutiny and failure to adhere to acceptable standards, or have viable justification for methods (i.e., sacrificial lure animals), may lead to subsequent revisions of permitting processes for banding, restricted access to public and private lands as study areas, and

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Table 1. Names and abbreviations for organizations, legislation, and documents associated with animal welfare in the United States referenced in this paper.

ABBREVIATION	NAME
AAALAC	Association for Assessment and Accreditation of Laboratory Animal Care
AVMA	American Veterinary Medical Association
AWA	Animal Welfare Act
GPUCVA	United States Government Principles for the Utilization and Care of Vertebrate Animals used in Testing, Research, and Training
Guide	The Guide for the Care and Use of Laboratory Animals
IACUC	Institutional Animal Care and Use Committee
ILAR	Institute for Laboratory Animal Research
IRAC	Interagency Research Animal Committee
LAWA	Laboratory Animal Welfare Act
NIH	National Institute of Health
NSF	National Science Foundation
OLAW	Office of Laboratory Animal Welfare, NIH
PHS	Public Health Service
PHS Policy	Public Health Service policy on humane care and use of laboratory animals
DOD	Department of Defense
USDA	United States Department of Agriculture

reduced funding support (Mulcahy 2003). Compliance failure can also contribute to agencies expanding their authority without an additional mandate (Arculus and Peters 2004, Bennett 2005). This phenomenon, termed regulatory creep, is becoming a recognized trend in animal welfare regulations and guidelines (Bennett 2005). We believe this trend can be curtailed by specialists within disciplines setting and adhering to agreed-upon ethical standards that are professionally and socially acceptable (Mulcahy 2003).

Our goal in this report is to provide an overview of animal welfare issues relevant to those permitted to work with birds of prey. We also provide researchers with information that may allow them to better draft their animal-use protocols by describing why it would be difficult to get approval for some methods and offering some suggestions as to how to obtain approval. We constrain our review to field-oriented rather than laboratory or husbandry-oriented research (e.g., captive rearing, physiological studies, rehabilitation). Specifically we: (1) review the development of animal welfare legislation, (2) explain who legally falls under the requirements of the Animal Welfare Act or the Public Health Service Policy on Humane Care and Use of Laboratory Animals, (3) explain what an Institutional Animal Care and Use Committee (IACUC) is, its responsibilities within a research/academic organization, and how it functions, (4) highlight areas of raptor research that are often problematic to IACUCs, and (5) provide suggestions on how raptor researchers may better work with their IACUCs. Our review and discussion is focused on the legislation in the United States of America. To avoid confusion, we describe terms associated with animal welfare in this paper in Table 1.

Animal Welfare Legislation

Concern for humane treatment of animal test subjects in the mid-1900s led to the development of The Guide for Care and Use of Laboratory Animals in 1963 (Guide; Institute of Laboratory Animal Resources 1996). Subsequently, Congress passed the Laboratory Animal Welfare Act in 1966 (7 U.S.C. 2131, Public Law 89–544), with enforcement responsibility assigned to the United States Department of Agriculture (USDA). This provided the first legal standards or guidelines for laboratory animal care in the United States (Office of Laboratory Animal Welfare [OLAW] 2002a). Subsequent amendments to the act included changing the name to the Animal Welfare Act (AWA), providing definitions of terms used in the regulations, and establishment of IACUCs to inspect research facilities and review research protocols that involve live animals.

The AWA specifically excluded ectothermic animals, birds, rats (*Rattus* spp.), mice (*Mus musculus*), and farm animals used in production agriculture, research, and teaching (U.S. Department of Agriculture 2009). However, in 1985 the Public Health Services (PHS) Policy, which defined animals as including all live vertebrates, required institutions receiving PHS funding to have established IACUCs in place to review animal use protocols (OLAW 2002b). A necessary component of the PHS Policy is an Animal Welfare Assurance that commits the institution to comply with PHS Policy regardless of the source of funding. PHS Policy is intended to implement and supplement the U.S. Government Principles for the Utilization and Care of Vertebrate Animals used in Testing, Research, and Training (GPUCVA; U.S. Government 1985) that covers all vertebrate animals and applies to all federal research entities.

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In 1965, the American Association for Accreditation of Laboratory Animal Care (AAALAC, later the Association for Assessment and Accreditation of Laboratory Animal Care—International; AAALAC-I) was established as a peer-review, private, nonprofit organization to promote the humane treatment of animals in science through voluntary accreditation and assessment programs. Currently more than 770 companies, universities, hospitals, government agencies, and other research institutions in 31 countries have earned AAALAC–I accreditation. To maintain accreditation, organizations are reviewed with an AAALAC-I site-visit every 3 yr to assure they meet current implementation standards of all animal welfare laws, policies, and guidance.

Animal Welfare Legislation and Raptor Researchers

Most granting agencies require that a research proposal that includes use or study of live animals contain procedures that are approved by an IACUC before a grant will be considered for funding. For instance, as a federal entity, the National Science Foundation (NSF) requires grant recipients conducting research or related activities with any vertebrate animal to comply with the AWA, PHS Policy, and GPUCVA (OLAW 2002b) and follow the guidelines provided by the Institute of Laboratory Animal Resources (ILAR 1996). The NSF also mandates that research protocols for foreign locations require approval by the U.S. grantee's IACUC (http://www.nsf.gov/pubs/policydocs/papp/aag_6.jsp). Additionally, an investigator affiliated with an AAALAC-I accredited institution may be more likely to receive Department of Defense (DOD) or National Institute of Health (NIH) funding. Hence, if a researcher intends to study raptors on military lands with DOD funding, they will most likely have to deal with an IACUC ascribing to AAALAC-I standards.

All federally employed researchers and anyone receiving federal funding must abide by these laws, regulations, and guidelines. This includes researchers that are not directly receiving federal funding for research, but are employed by an organization that does (e.g., state university, museums, medical research companies, nongovernmental organizations, nonprofits). Additionally, some state and private agencies voluntarily institute policies that are consistent with the federal guidelines; hence, employees of such agencies must also abide by the guidelines. Finally, acceptance of manuscripts for publication in some journals may be contingent upon an IACUC approval.

Institutional Animal Care and Use Committees

To receive federal funding, or funds from nonfederal organizations that require protocol review, research institutions must provide assurance of compliance with animal welfare legislation. This is provided by an IACUC, which reviews for approval all research involving vertebrate animals, not just those funded by federal sources. The AWA requires the Chief Executive Officer of each organization to appoint an Institutional Official. The IACUC and the attending veterinarian report to the Institutional Official. At a minimum, the IACUC is composed of a chair, an attending veterinarian, a person not affiliated with the organization that can represent the general public interest in proper animal care and use, a practicing scientist, and a nonscientist (OLAW 2002a). Typically, IACUCs consist of more members, usually from the scientific arena, to provide expertise on different topics. It is the IACUC's responsibility to ensure that each protocol meets the requirements of the AWA, PHS Policy, the Guide, and the GPUCVA. The IACUC is also authorized to suspend activities (including freezing of research funds) if they find that a study involving animals is not being conducted in accordance with its approved protocol.

Laber and Young (2007) suggested that field studies represent a small percentage of the projects reviewed by IACUCs, but our experience suggests this may be dependent on each institution. Regardless, the only interaction most field researchers have with the IACUC is submission of protocols for review and approval. Field researchers may perceive some protocol review requirements and explanations as onerous and unwarranted, but must bear in mind that these are legal requirements and not capricious acts by an IACUC. Compounding this situation is the fact that many IACUCs are primarily composed of laboratory scientists who often have a poor understanding of the use of animals in field research. Thus, approval of protocols is often delayed pending clarification by the researcher. It is essential that the researcher fill out the protocol form so that the logic and methods are easily understood by individuals not engaged in field research.

IACUC Review

The IACUC will focus on nine principles from the GPUCVA (ILAR 1996) when reviewing animal-use protocols (Table 2). To facilitate protocol approval, raptor researchers need to appropriately address each principle. Animal-use forms, used for submit-

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Table 2. United States Government principles for the utilization and care of vertebrate animals used in testing, research, and training (U.S. Government 1985).

NUMBER	PRINCIPLE
I.	The transportation, care, and use of animals should be in accordance with the Animal Welfare Act (7 U.S.C. 2131 et. seq.) and other applicable federal laws, guidelines, and policies.
II.	Procedures involving animals should be designed and performed with due consideration of their relevance to human or animal health, the advancement of knowledge, or the good of society.
III.	The animals selected for a procedure should be of an appropriate species and quality and the minimum number required to obtain valid results. Methods such as mathematical models, computer simulation, and *in vitro* biological systems should be considered.
IV.	Proper use of animals, including the avoidance or minimization of discomfort, distress, and pain when consistent with sound scientific practices, is imperative. Unless the contrary is established, investigators should consider that procedures that cause pain or distress in human beings may cause pain or distress in other animals.
V.	Procedures with animals that may cause more than momentary or slight pain or distress should be performed with appropriate sedation, analgesia, or anesthesia. Surgical or other painful procedures should not be performed on unanesthetized animals paralyzed by chemical agents.
VI.	Animals that would otherwise suffer severe or chronic pain or distress that cannot be relieved should be painlessly killed at the end of the procedure or, if appropriate, during the procedure.
VII.	The living conditions of animals should be appropriate for their species and contribute to their health and comfort. Normally, the housing, feeding, and care of all animals used for biomedical purposes must 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. In any case, veterinary care shall be provided as indicated.
VIII.	Investigators and other personnel shall be appropriately qualified and experienced for conducting procedures on living animals. Adequate arrangements shall be made for their in-service training, including the proper and humane care and use of laboratory animals.
IX.	Where exceptions are required in relation to the provisions of these Principles, the decisions should not rest with the investigators directly concerned but should be made, with due regard to Principle II, by an appropriate review group such as an institutional animal care and use committee. Such exceptions should not be made solely for the purposes of teaching or demonstration.

ting protocols for IACUC review, are designed to provide the required information for the committee to assess these principles. Principle 4, ''avoidance or minimization of discomfort, distress, and pain when consistent with sound scientific practices,'' is an imperative and unless the contrary is established, an IACUC will consider procedures that would cause pain or distress in human beings as likely to cause pain or distress in other animals (Table 2). When exceptions to these principles may be necessary (e.g., Principle 9) the decisions should be made, with due regard to Principle 2, by an appropriate review group such as an institutional animal research committee (Table 2).

Field researchers may become alarmed, dismissive, or both when reviewing the list of principles, and a common sentiment is exasperation at being required to answer questions that do not appear to relate to field studies. For example, protocols require clarification as to how study animals will be euthanized if necessary to be consistent with Principle 6, Table 2, and if the method is approved by the American Veterinary Medical Association (AVMA 2007). Although it is extremely rare for a researcher to have to euthanize a raptor when conducting field research, this question must be answered. Acceptable methods for euthanasia of birds are barbiturates, inhalant anesthetics, CO_2, CO, and gunshot (AVMA 2007: Appendix 1). For numerous safety reasons, field researchers usually do not carry, or have permits to carry, inhalant or injectable pharmaceuticals for euthanasia. The physical alternatives for bird euthanasia approved by the AVMA (2007) are cervical dislocation, thoracic compression, and gunshot (when collecting specimens). However, cervical dislocation and thoracic compression are 'conditionally approved' methods that require the researcher to justify their use before an IACUC will approve it. Furthermore, these methods are only applicable for smaller-sized birds; an IACUC may require researchers working with large raptors (e.g., eagles) to anesthetize individuals prior to eu-

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thanasia. Justification in such cases would require explanation of why you cannot use an approved method of euthanasia, and why your chosen method is more humane or safer for both animal and investigator in the circumstances under which you must euthanize the animal.

RAPTOR RESEARCH AND THE IACUC

Study of raptors may include target species, nontarget species, and lure animals. Therefore, the IACUC must evaluate not only the nine principles (Table 2), but also specific items within the care and use protocol designed to provide information necessary to assess compliance. A lack of clarity about animal care or handling in the submitted protocol may lead to additional questions by the IACUC (Laber and Young 2007). Furthermore, studies not involving the capture of living animals (i.e., observational studies) may still affect their behavior, survival, or reproductive rate and are, therefore, of concern to IACUCs. Many research institutions are requiring IACUC review of such studies to ensure legal protection for both the institution and the investigator should the work become publicly contentious.

A primary tenant of the animal welfare laws is reducing the number of animals used in research. Thus, animal care and use protocols require identification of the species and number of each to be captured, the method of capture, and what exactly the research entails (usually in chronological order). Laboratory scientists can use a power analysis to decide on the number of animals to purchase for a given study, but in contrast, raptor researchers are often limited by the number they can capture. However, researchers must justify the number of animals to be used and this requires the researcher to provide data, data-based assessment, or other use criteria (e.g., power analysis, number of animals needed to train students in a class) that support assertions that the 'appropriate' number of animals are used to answer the research or teaching question. The key element is for the researcher to identify the maximum number of animals they expect to use and justify this in terms of their ability to meet their objectives. Even the goal to capture and mark as many individuals as possible (e.g., banding stations) can be justified with a well-defined research question (e.g., population monitoring, physical condition of migrants) in the protocol. An IACUC will likely assess capture with no clear scientific, management, or educational context or question as tantamount to harassment (50 CFR 17.3, revised 2009; http://www.access.gpo.gov/cgi-bin/cfrassemble.cgi?title=200950).

Many methods for handling and marking raptors and collecting samples (e.g., blood samples, feather samples) from them are relatively straightforward and unlikely to encounter objection from an informed IACUC. However, questions may arise on the appropriateness of transmitter mass for the study animal, how transmitters are attached (e.g., backpack, tail-mount), or about invasive marking methods such as patagial tags. These issues are usually alleviated if the researcher clearly addresses the approach and appropriateness of the methods. Varland et al. (2007) and Kenward (2001) are excellent references for describing handling and marking studies.

Lure Animals. The most consistent problems in IACUC approval of raptor research involve the use of live lure animals and the method of capture of the target species. Lure animals are also considered animals used in research. The IACUC will require that all lure animals are also accounted for under the animal use protocol and treated in accordance with the nine principles (Table 2). Quantifying the potential distress (Principle 4) that lure animals experience is exceedingly difficult, but the researcher must explain how this distress is necessary to reach the research objective and how it can be minimized.

The welfare of the lure animal in the trap will also be of concern to the IACUC. The committee will want to know how long a lure animal may be left in a trap and under what conditions. For example, lure pigeons (*Columba livia*) in a Swedish goshawk trap (Bloom et al. 2007) are protected from potential predators, and, if reasonably sheltered from adverse climate conditions, may be left unattended for extended periods. In contrast, a mouse in a balchatri trap (Bloom et al. 2007) could succumb rather quickly to adverse environmental conditions. The conditions to be encountered vary among locations and trapping conditions, but reasonable conditions and time periods to which lure animals will be exposed need to be explained in the animal-use form.

Lure animals that are not protected from direct contact with a raptor (e.g., tethered pigeon with a bow net (Bloom et al. 2007)) or are intentionally sacrificial (e.g., tethered sparrow in a phai trap (Bloom et al. 2007)) are especially problematic from an animal welfare perspective. The issue is not so much the risk of injury or death of the lure animal, but the interpretation (AVMA 2007) of what

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constitutes a humane death. The use of sacrificial or unprotected lures is likely to receive approval only when it can be demonstrated to be a necessary method for a study of recognizable merit. For instance, in the case of Northern Spotted Owls (*Strix occidentalis*), a high priority species for conservation efforts, 'mousing' is a recognized, effective technique (Lint et al. 1999) that would be justifiable to an IACUC. In contrast, it would be difficult to approve the use of a tethered sparrow in a phai trap to capture passage Prairie Falcons (*Falco mexicanus*), as there are other capture methods that cause less stress or harm to a live lure, and Prairie Falcons are not a species of particular conservation concern.

The use of a live, non-releasable Great Horned Owl (*Bubo virginianus*) in a dho-gaza trap is a common, highly effective means to trap nesting raptors. These lure animals must be held under state and federal permits specifically for the use of trapping raptors. To facilitate IACUC approval of the use of live owls or other raptors, researchers should refer to the OLAW guidelines, which state the IACUC can rely upon the U.S. Fish and Wildlife Service and relevant state wildlife agency, as issuer of the necessary permits, for acceptability of risks to the target animal (OLAW 2002b: page 135). This policy of accepting the permitting agencies' decision of acceptability of risk to target animals could be presented to IACUCs for justifiable and approved use of owls being held under state and federal permits for the specific use as lure animals in dho-gaza traps. A common suggestion from IACUCs is to use taxidermy mounts as lures for capturing wild raptors. Some researchers (Bloom et al. 1992, McCloskey and Dewey 1999) have had success with this method, but in our experience taxidermy mounts are not as effective as live birds. Success using artificial lures is likely dependent upon the aggressiveness of the individual raptor species, and in some cases using artificial lures may result in unnecessary stress on the target raptors by requiring repeated capture attempts before success is achieved compared to one attempt with a live lure.

Methods of Capture. In addition to the welfare of lure animals, IACUCs focus on the welfare of the animal being captured in context of the risks associated with the capture method. For example, leg-hold traps have been used successfully to capture some raptors, but also have inflicted severe injury to others (Bloom et al. 2007). Use of leg-hold traps for raptors will require specific descriptions of how the traps are padded and weakened and how the methods the researcher will use avoid injury to nontarget species. Risk of injury is especially a concern when leg-hold traps are left unattended (e.g., Bloom et al. 2007). Only unattended traps that will protect the lure animal(s) from the captured raptor, and protect a captured raptor from self-injury or injury from another animal are likely to be accepted by an IACUC. For example, a falling-end trap (Kenward et al. 1983) would protect a captured Cooper's Hawk (*Accipiter cooperii*) from predation by a larger raptor, but would not be acceptable if it was constructed of material (e.g., chicken wire) on which the hawk could injure itself.

Another example is using bal-chatris in a trap-line with multiple traps placed to catch a specific pair of raptors in a territory, or placed across several square kilometers to catch as many raptors as possible (Bloom et al. 2007). In many cases, the traps are checked hourly or monitored with trap-monitors (Bloom et al. 2007). In our view, an IACUC is unlikely to accept this approach for several reasons. First, the lure animals may become exposed to harm (e.g., fire ants, heat). Second, the captured raptor may become exposed to harm and, in some cases killed (Bloom et al. 2007). Third, nontarget animals may become captured and injured. For instance, we have observed Loggerhead Shrikes (*Lanius ludovicianus*) and Cattle Egrets (*Bubulcus ibis*) getting their heads caught in bal-chatris. Although remote trap monitors are excellent tools for leaving traps unattended, a trapped raptor could be killed before the researcher arrives, especially when traps are deployed across large areas. As a final example, verbail and other pole traps (e.g., Bloom et al. 2007) are often left unattended. However, Bloom et al. (2007) reported American Kestrels (*Falco sparverius*) killed by Red-tailed Hawks (*Buteo jamaicensis*) and Barn Owls (*Tyto alba*) and Great Horned Owls killed by coyotes (*Canis latrans*) when these types of traps were left unattended, and suggested checking traps every 30 min. to reduce this unintentional mortality. Despite some of the issues related to remote trap monitors, use of these devices for unattended traps would facilitate IACUC approval.

CONCLUDING THOUGHTS

The intent of the AWA, the PHS Policy, the Guide, and others is to eliminate unethical use of animals in research. We believe this is an admirable goal, but that it has resulted in a morass of rules and regulations directed toward laboratory animal research. As such, many of the 'clinical' approaches

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used by IACUCs are not realistic for field research. Regardless, many raptor researchers and teachers must obtain institutional approval for their research.

We believe research restrictions due to animal-welfare issues are likely to become more onerous due to increasing public concern over animal treatment, greater concern about public image by universities and agencies, and enforcement (often ascribed to OLAW or AWA policies and regulations) of more restrictive regulation even though laws and policies have not changed (Arculus and Peters 2004, Bennett 2005). A cavalier approach to the care of lure animals or the occasional injury or death of raptors in unattended traps will only exacerbate restrictions upon research and banding permits. All raptor researchers should carefully consider the methods they use in their studies.

Finally, we suggest that raptor researchers become familiar with the rules and regulations under the various laws as they apply to their institution or agency. For example, many of the guidelines use the wording ''should,'' not ''must.'' The Guide (ILAR 1996: page 3) itself provides a useful distinction between the use of ''must'' and ''should.'' This is an important distinction in the implementation of policies and can be lost with membership turnover in an IACUC. We also suggest researchers serve on IACUCs; there is no better way to become familiar with animal welfare concerns. More importantly, raptor researchers can help educate other IACUC members about raptor welfare, research methods, and field constraints that can provide appropriate justification for continued use of efficient and humane methods.

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