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Studied to death: An investigation of ethics in wildlife research

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STUDIED TO DEATH

AN INVESTIGATION OF ETHICS IN WILDLIFE RESEARCH

By

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Having long considered myself an animal both in body and spirit, I have always found the gap between myself and other species significantly smaller than our present culture's treatment of them would have us believe. Nor have I ever regarded myself alone in this intuitive understanding. Prior to my present research, I believed that the wildlife profession shared this belief of evolutionary, if not spiritual, connection with other animals and acted accordingly. However, an introduction in my graduate courses to the present state of wildlife research spurred my thoughts otherwise. I became fascinated, almost haunted, by the profession's highly apparent regard for wildlife species and its equally apparent disregard for the living animals comprising those species, using them as test models and data collectors for the future and theoretical "good." In an attempt to understand this behavior toward animals, my fascination led to an immersion--through interviews, surveys and readings--into science's system of values and beliefs, culminating in the following discussion and critique. For in the realm of human/animal relations, and that is surely the realm in which researchers dwell, the wildlife profession has surprisingly little to say. Even in its much heralded Code of Ethics, that of the Wildlife Society, the word "animal" is not to be found (wildlife "resource" is), nor any mention of the relation or ethical behavior of the researcher as regards animals.

My hypothesis that wild animals may be in need of protection from their "protectors" will no doubt be regarded as heresy in the wildlife profession; however, to the outsider looking into this unique world of human/animal interactions, an investigation of the present state of wildlife research indicates such a theory is both valid and timely. For, while much that the profession accomplishes is worthwhile and of benefit to wildlife, other activities and intentions remain highly questionable.

Science has never been the one to point the finger at science. Laboratory research on animals reached realms of horrendous abuse before outside checks were placed on it. My work--to undertake a similar investigation of research on animals in the wild--will, I hope, mark the origins of a much needed reassessment within the wildlife profession before science completes its current trend of subjugating wildlife to technology and the living present to the theoretical future, destroying the integrity and wildness of the animals it purports to protect.
ACKNOWLEDGMENTS

My first gratitude is to Ron Erickson and Mary Birch who returned me to this new/old path of human/animal connections and who did so with great energy and sensitivity. I especially thank Ron for his enduring faith in this project and its premise. It was he who reminded me, in his balanced and thoughtful way, that only in the best tradition of challenging the gods will one succeed in arousing perceptions, creating discussion, and changing the world. Therefore, if I offend the meek, the tradition-bound, or the professionally ensconced with my words, it is with great equanimity that I do so.

A heartfelt thanks to the rest of my committee, Kathy Miller, John Tibbs, and Charles Jonkel, for giving so generously of their time and expertise. I am also indebted to the Environmental Studies Department for its financial support of my Wildlife and Ethics Survey and to all the interested and knowledgeable biologists who responded. And I thank Cathy Maynard, good friend and statistical wiz.

To Joe, who nightly encouraged me and put up with me in my struggle to complete this project, I am forever grateful. And I thank Jim who also believed in my ability to do my best work and finally finish. And, most importantly, I thank my young daughter who has endured, these past few years, an often preoccupied mother. For her patience, her boundless energy, her awe and respect for all living things, both inconspicuous and grand...this paper is dedicated to Laura.

Finally, I give gratitude to all the wild animals—my teachers, my relations—who have so enriched and emboldened my life...and to William Blake, that planetary visionary and quiet revolutionary of the written word, who 200 years ago said it right: "All that lives is holy."
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PART ONE

We have an ethical problem regarding wildlife: insensitivity to life, death, and trauma.

--Anonymous Research Biologist
Wildlife and Ethics Survey
Today's wildlife biologists are indeed curious animals. Armed with dart guns, rocket nets and snares, with surgical knives in hand and a pharmacopeia of drugs at their legal disposal--telazol for polar bears, xylazine for deer--our modern researchers of wildlife appear as hunters intent on their prey: the 65,500 other vertebrate species on earth, those "others" without access, of course, to the sophisticated technology of biological research which increasingly surrounds, impounds, and penetrates them. At a time when the earth's remaining wildlife confronts menaces to survival from every direction and extinction is a daily occurrence, wild creatures may be facing a new and improbable threat--overzealous research biologists engaged in the nearly omnipresent monitoring of wild animals, ever new forms of biotic manipulation, and the unprecedented acquisition of empirical data.

Modern technological advances have, undeniably, revolutionized the science of wildlife study, dramatically increasing the researcher's ability to handle, monitor, and manipulate animals in the wild, thereby unleashing a host of ethical questions involving our responsibilities and obligations to nonhuman animals. Yet science itself
has been largely silent on these questions, continuing to advocate and practice the burgeoning use of radio-telemetry, satellite tracking, darting, drugging, and surgical implanting on wild animals while ignoring the moral consequences of such acts. As in the case of laboratory research on animals, it is the philosophers and ethicists who must once again rush to catch up with science in its breakneck pace of amoral technological creation and offer principles of right conduct and thoughtful restraint. For in the biological journals and abstracts, where the biotic manipulation of individual animals is a given, there is little if any discussion about it. New, more efficient technologies are constantly appearing, increasing our material access to the bodies, blood, and behavior of wild animals. And they are being used unquestioningly. Or so it appears, since it is the presentation of experiments and research data which continues to fill the "respected" biological journals with little or no meaningful intellectual discourse on the import, necessity or moral correctness of these experiments: a lack of ethical consideration which traditionally parallels, in whatever form of human act, a denial of responsibility. Is it possible, therefore, that wildlife is in need of safeguarding from its own intended protectors? What exactly are the impacts of biologists on their study subjects and why are these
impacts not being documented and openly discussed?

A recent letter from a bear biologist with the Department of Interior vividly underscores this collusion of silence within the wildlife profession. Seven years ago this same scientist attempted to organize a workshop entitled, "The Impact of Biologists on Bears," in order to prompt discussion among his peers on what he deemed vital questions: In what ways may scientific investigations be detrimental to the animals involved and how can such harm be avoided? What artifacts of the research process may be producing spurious results and interpretations? What are the responsibilities of biologists to their study subjects? The workshop failed to materialize; in 1990 he reflects on this failure...

You were asking about my proposal for a workshop on the impact of biologists on bears...What had triggered my concern was the den abandonment triggered by my own winter research. I spoke about this at some length at the Grand Canyon IBA (International Bear Association) meetings in 1983. A few biologists discreetly confessed similar tales.

Unfortunately, while there was interest from some quarters, the idea met with a strongly negative reaction from working field biologists, who would be key to making any progress on the subject. This is undoubtedly highly subjective, but I detected a clear note of anxiety and defensiveness in the many negative responses I got.

So the upshot is that I dumped the idea. I have enough other irons in the fire that I haven't considered pursuing it. I do, however, agree with you that the issue is cogent and timely.
It is exactly this absence of moral reflection, of open dialogue and discussion, which I find at least as disturbing as much of the wildlife research itself. Technology is itself neutral, yes, but its use for specific purposes—including experiments on wildlife—is not, and raises valid ethical questions, questions which are not being asked within the wildlife profession. Indeed, these important questions are scarcely being asked at all. For while outside attention has zeroed in on laboratory animal research, equal scrutiny has not been given to research conducted on animals in the wild. One assume understandably, that all is well with the ethologists and ornithologists. These are, after all, the men and women who entered this profession because of their love and regard for animals, are they not? And the answer is, yes, mostly. However, the wildlife profession itself does not appear to share this high regard for living animals. In fact, the institution of wildlife biology, like the scientific community of which it is a part—with its prolific use of animals as commodities for resource profit and medical and toxics research—does not yet recognize nonhuman animals as part of the moral community with its inherent obligations and responsibilities; this, despite its professed belief in both evolution and ecology, those two revolutions of modern biological thought which bind us inextricably, irrevocably to other animals.
And so, to the much needed query, "Who's watching the animal watchers?" the answer is, scarcely anyone. And yet, with the advent of ever more ingenious tools for wildlife research and manipulation, the need for such monitoring is greater than ever. For it is not technology per se which poses the threat in wildlife/biologist relations, rather the mounting potential for its thoughtless misuse or arrant abuse against animals. It is time, therefore, that an ethic of limits and restraint be discoursed for the wildlife profession, that voices of consciousness and concern be raised and heard; voices that turn out to be, as we shall see, decidedly feminine in nature.
The lack of concern for the suffering of individual animals was conveyed in part by the silence of most naturalists about it.

--Eugene Hargrove

In an effort to encourage critical thought on biologist/animal relations and establish this missing ethical dialogue among wildlife professionals, I decided to risk discomfort to them and hostility to myself, by eliciting opinions from the researchers themselves, those who work directly with animals in the wild and have access to the available tools and technologies. To this end, I elected to interview several regional biologists as well as distribute a 22-question survey examining critical issues in wildlife research, including regard for and treatment of wild animals undergoing experimentation, necessary vs. unnecessary research, and who shall define what is "necessary."

Over 200 researchers were invited to participate with other wildlife biologists in this nationwide survey involving questions of ethics in research (see Appendix for survey in its entirety). I designed the questions in hopes of discovering current codes of conduct among
wildlife professionals as well as attitudes toward their study subjects and perceptions about animals in general. And while some of the questions and ensuing responses did not prove of key import to this inquiry, a number of them did, contributing to the themes and fabric of this paper.

Biologists with published articles were selected from the *Wildlife Society Bulletin*, 1985-88. Twenty-five active researchers in Montana were invited to participate as well. As stated in its letter of introduction: "This questionnaire offers you the opportunity to air your views about the present state of wildlife research, its ethical challenges, and its future directions."

Exactly 103 individuals returned the survey, an acceptable, even satisfying percentage (52%) considering my request for many subjective responses, including two, page-length essays. Three individuals responded with open hostility, condemning the survey as "ambiguous" or "unscientific." An equal number added a personal note of thanks with wishes for a publication of results. Overall, I was made privilege to a rich diversity of opinions and often deeply personal beliefs about animals, but beliefs colored by an overriding concern for adherence to professional and scientific codes of theory, language, and conduct.

In brief, my findings reveal a satellite science
of what "good" Science has always been: a patriarchal, white male dominated profession which reveres linear thinking, hard quantitative data, means/ends efficiency, and decisions made from the neck up. And yet, just as importantly, my findings reveal many sensitive individuals who hold animals in high regard and strive for their humane treatment but whose innermost values conflict with political and economic realities and the codified thinking of a scientific culture whose acceptance they seek. This almost crippling conflict of inner values vs. the scientific consensus is well illustrated by the opinions of those former researchers I spoke to who had voluntarily left the profession and by the following response to the query, "...what does an animal mean to you personally?" (question 16, Table 6) This particular respondent chose to begin with Thoreau's famous quote:

"In wildness is the preservation of the world."

Wildlife is a critical element of wildness that I consider essential from both a Darwinian sense (self preservation as a species) and spiritually. Much of research is in some ways regrettable as the lesser of evils in preserving that wildness. For managers have consistently refused to find in favor of wildness and against economic interests in the absence of hard, quantitative information to the contrary. As a result we sometimes sacrifice the values we seek to preserve. (emphasis added)

Can science itself have moral values? Traditionally science has claimed not, intent on the efficient accumu-
lation of experimental data to support or refute theories of evolution, ethology, or other general laws. Many believe science is not the realm in which morality can even be discussed, citing that science is only predictive of events—dispensing theories, not behavior, and having no ties to the nature of choice in human action. Such prescriptions of behavior belong to the realm of ethics, certainly; and yet science does indeed prescribe precise human acts toward other living beings in the realm of biological and medical research. Thus, while declaring itself a "pure" discipline without moral context or a system of ethical values, science's true ethics are betrayed by its very deeds—including its deeds to animals—the technology of materialism it invents/selects to undertake those deeds, and its own flat, efficient, utilitarian language.
The mind—the culture—has two little tools: grammar and lexicon.

--Annie Dillard

In reviewing the biological literature most often used and indeed largely written by professional wildlifers, I was repeatedly struck by both its style and grammatical use of language, a mode of writing apparently encouraged of wildlife biologists and science professionals in general. As a student of language and literature, I can only recoil from its cold, dry as dust objectivity, its antiseptic gaze on death and indignity, and its consistent use of the passive voice to avoid the appearance of responsibility. For in the passive construction, the actor, the doer, has disappeared—does not exist—replaced by the deed itself, sterile and isolated, and apparently accomplished without human input.

The following report, randomly selected from the Fall 1986, Wildlife Society Bulletin, serves to illustrate 1) the near total lack of active voice in the scientific literature of animal experimentation, 2) the equally complete lack of acknowledgment of anything resembling a living, breathing, sentient being undergoing experi-
mentation and 3) the purposeful obscuring of language and intent by the persistent use of euphemisms.

This particular experiment involved possible primary and secondary poisoning to small mammals following "control" of coyotes with lethal Compound 1080 (sodium monofluoracetate), one of many poisons historically used to kill coyotes in favor of livestock proliferation on public lands. I quote from the article at length:

**Methods.**—Striped skunks, raccoons, and opossums were live-trapped in east-central Texas and housed outdoors in individual cages. Test animals were provided 500 g commercial dry dog food once a day and a continuous water supply. The animals were acclimated for a minimum of 10 days prior to testing. All testing was conducted during an ambient temperature range of about 23-37 C.

Five coyotes were administered doses (oral gavage) that simulated those a coyote could possibly receive from field use of 1080 for predator control...Upon death, coyotes were skinned, eviscerated, and myectomized. All muscle tissues were combined and ground in a commercial meat grinder. The viscera, excluding the gastrointestinal tract, were prepared similarly. These ground tissues were labeled, packaged separately, and frozen for later feeding to the test animals.

The test animals were fasted for about 24 hours before being presented with 100 or 200 g of ground tissue. Water was provided ad libitum, and no other food was available. Test animals were returned to the standard diet of dry dog food after the ground tissue was consumed. Only animals that consumed >85% of the presented tissue within 12 hours were considered in the analyses (3 skunks refused to eat, and 4 skunks and 4 raccoons could not consume the required amount because it spilled through their cage floors). The animals' reactions were monitored every 4 hours until death or recovery, which was, for the purpose of this study considered complete when the test animal showed no clinical signs of 1080 intoxication and had returned to its normal feeding habits by the end of a 4-day observation period.
Acknowledgments.—We thank T. Blankenship for aid in dosing animals and L. Robinson for processing coyotes. We are grateful for the partial financial support from the U.S. Fish and Wildlife Service which made this study possible.

It is indeed a passive, soulless voice which science presents in its literature on animal research, perfectly reflective of a mode of thinking which exists outside the moral realm of active responsibility. Other than in the acknowledgment, not one human "I" or "we," man, woman, or biologist, appears as the subject, as the doer of the deeds; that traditional position of responsibility, the head of the sentence, is granted instead to the animals. And when the human "we" finally does appear in that acknowledgment, it is not gratitude to the animals that is expressed for giving, albeit unwillingly, of their bodies and lives, but rather to the two people who "dosed" and "processed" them.

Except perhaps for bureaucrats and politicians, scientists are unparalleled in their ingenious use of euphemisms to shield themselves from accountability and responsibility for their actions. Modern linguists even have a new word for it, doublespeak: the obsfuscation of language in order to shift or avoid responsibility. Use of euphemisms in doublespeak allows the negative to appear positive, the unpleasant pleasant, the immoral moral, and where convenient, vice versa. With such sleight of word, doublespeakers are able to conceal or even prevent
critical thought and debate. Thus, in the language of field biology, wild animals are not victims of research to be caged, poisoned, and possibly killed. Rather, they are "test animals" which are "housed," "dosed" and "processed;" rather like an innocuous manufacturing process, perhaps of cold cuts or velveeta. Likewise, coyote "control" has replaced the more accurate coyote killing; mammals are now clamped by their legs in "Soft-Catches," padded steel traps; and "nuisance animals" (i.e., those whose natural behavior has been found offensive to humans) are "relocated" or "translocated" rather than banished from their homes and families--usually after being drugged, caged, and hauled by their bellies from a helicopter. In a similar abuse of language, wildlife managers "harvest" elk and deer, corn-like, in order to build a case for renewable resource funding; while researchers, rather than kill a "scientifically admissible" percentage of their animal subjects, "sacrifice" them, surely a perversion of the original meaning of the word, derived as it is from the Latin, sacrare--a sacred homage to a higher being, in this case, no doubt, the deity being Science. And that deity has shown, through its use of language--and words are but powerful indicators of belief--that in the realm of biologist/animal relations it rewards efficiency, objectification, and disconnection above all else.
Quo animo? With what spirit or intention? With regards to research on wildlife, those intentions are often not clear, obscured by the profession's deeply ingrained linguistic habit of passive voice and euphemistic deception. For in its presentation of wildlife experimentation and research, whether that research is justified or not, the language of science has consistently failed to call it as it is, violence to animals.
PART TWO

To me it is inconceivable how anyone should think an animal more interesting dead than alive.

--Joseph Wood Krutch
We are not conducting this inquiry in order to know what virtue is, but in order to become good.

--Aristotle

Violent intrusion to animals is not a new concept to professional wildlife biologists. For most now working, it was introduced and encouraged early in their scientific career. Required throughout their education to perform lab exercises involving the dissection of live and preserved animals, these young scientists quickly learned that animals are disposable objects, easily replaced and not worthy of further regard.

Even those of us who did not go on to become scientists remember the exact day we were required to perform our first dissection in biology lab in order to pass the course...and the atmosphere of disgust and disrespect which attended the scene...the snapping of seemingly delicate, white intestines across the room, the tossing of a live frog into a jar of formaldehyde by a hurried teacher who could not think what else to do as the lunch bell rang. Naturally, such invasive experiments--this careful mutilation of amphibians, for example, in order to view their inner parts--fail to
instill in young people an understanding of and respect for living organisms, their unique qualities and value as individuals, and their profound connections to other living beings and the environment in which they participate and live. "Instead these programs emphasize a narrow, mechanistic approach to biology, focusing on the parts and systems of animals, rather than the animals themselves and their relationships to their surrounding."  

Consequently, rather than experiencing living animals—vibrant and intimately involved with other living organisms in their environment—today's wildlife professionals spent much of their study time probing and looking at dead ones, memorizing the names of disconnected body parts and their functions. And this distancing from animals actually commences at the cellular level of study, yet another step removed from the reality of living, autonomous creatures. Moreover, young biology students are often required to perform experiments involving major manipulation of an animal's behavior or environment, including sudden or drastic changes in diet, light, or temperature; exposure to toxic chemicals; even surgical techniques—experiments which foreshadow the sanctioned manipulation of unwilling animals in the analogous adult world of medical and biological research.

Requiring such exercises of young students focuses their attention on stressed animals in abnormal conditions
rather than animals living and functioning as normal members of the biotic community. (Science fairs are particularly notorious for encouraging and rewarding such projects.) Moreover, most such experiments, dissection included, are confirmational in nature, demonstrating phenomena that are already well documented and available for study on graphics or simulations. Other experiments (how will the animal react to lack of nutrition, high heat, and other violent stress?) are absurdly obvious as well, encouraging unnecessary manipulation of living creatures to answer questions of scant value. Little wonder, then, that students of wildlife can become desensitized to the pain and suffering of animals; they are trained to do so.

Not surprisingly, the dissecting/killing of animals by young students is profitable business for the biological supply houses: "Every year millions of animals--frogs, fetal pigs, mice, mink, crayfish, worms--are killed and preserved or shipped alive to be killed later in the laboratory...In one year alone, U.S. suppliers shipped approximately five million frogs for education and research purposes." Such exploitation for profit even created a recent dangerous decline in the population of _Rana pipiens_, our native grass frog.

Ultimately, of course, such a reductionist, utilitarian approach to nonhuman animals serves to
perpetuate the attitude that other creatures exist solely for the benefit and profit of human beings. And it is not this attitude alone which concerns us but, more importantly, the behavior toward animals which necessarily follows. As Aristotle understood and pointed out in his system of ethics, one's acts are acquired by habituation and the more deeply ingrained the habit, the more automatically will one behave in certain ways: "Hence it is no small matter whether one habit or another is inculcated in us from early childhood; on the contrary, it makes a considerable difference, or rather, all the difference."6

Thus indoctrinated, the young scientist comes to regard living creatures as mere tissue for experimentation, tools to be used to satisfy the intellect with its unending curiosity and quest for knowledge. And despite its apparent link to contemporary technology and materialism, such an objectifying approach to animals is anything but new to the naturalist's tradition; it is as old, in fact, as the shotgun and the scalpel.

The Naturalist Tradition

For the eighteenth and nineteenth century naturalists, precursors of our modern field biologists, killing animals was the standard way to study them. Although a few outstanding naturalists stand out as different in this
respect (John Muir for example), alternatives to killing were rarely sought by others. In fact, when Lewis and Clark journeyed through the wild Northwest in 1804, the land teemed with wild animals never before seen by these explorers and desiring to observe and study them, they shot any and all that came within range. The morality of such acts was not an issue; like those of most naturalists that followed, the journals of Lewis and Clark are completely lacking in anything resembling a wildlife conservation attitude. Even the later naturalists who put forth a protectionist attitude expressed little concern for the pain or suffering of individual animals. Their primary regard was for the unnecessary killing of animals—in particular those who seemed headed for extinction: "If there was a good reason for a particular animal to be killed, the naturalists were indifferent, if not insensitive, to its sufferings." And studying the dead animal for scientific or artistic purposes was apparently good reason enough. Both John Audubon and George Catlin did so, killing hundreds of animals in the process of identifying and painting them, even deriving pleasure in the viewing of their deaths.

George Catlin, for example, on one occasion wounded a buffalo and studied its suffering. In a long passage recounting the event, Catlin describes the immense aesthetic pleasure he experienced while admiring the death of the
buffalo. Without any feeling of guilt or twinge of conscience, he baits the bull so as to increase the sublimity of its expression. He finally puts the animal out of its misery, not out of concern for its unnecessary suffering, but simply because it is time to go. To Catlin, the death agony was not wanton, since it provided him with an opportunity for making valuable sketches.

Even William Holmes, the scientist and artist who fought for the preservation of Yellowstone and the Grand Canyon, expressing immense sensibility to their geologic wonders, was completely callous in his attitude toward the wild creatures living there. As his field notebooks make perfectly clear, Holmes "automatically attempted to kill any animal that came within range of his rifle," taking positive delight in their deaths. ¹⁰

This lack of moral concern for the suffering of individual animals continues in the educating of young biologists today, where killing animals to study them persists as the normal practice in the lab and collecting "specimens" (i.e., dead animals) is still the accepted practice in the field. In a recent wildlife techniques class at the University of Montana, students watched as their head professor (an avid hunter) unexpectedly shot a deer at the National Bison Range, presumably to let them view the workings of its inner parts. One woman I spoke to admitted her feelings of distress, but the morality of such an act never became an issue for the class. Such issues belong to the philosophy department.
across campus. For traditional science refuses to mix with the moral philosophers, and so long as scientists can calculate a use, any use, for the pain or death of an animal, it will be justified.

The Isolation of Science

Historically then, scientific education has placed great value on the intellectual and calculative modes of mind, neglecting the meditative and instinctive. In speaking of this meditative state, the philosopher Heidegger believed that humanity alone of all the creatures can illuminate the universe through awareness, serving as the "there," or place, for all beings to stand revealed. But this sense of Being, this profound responsibility to serve as the locus or matrix of luminosity for creation, has been forgotten, resulting in the present scientific/technological age. For Heidegger perceived that the essence of modern technology is not its devices but, rather, its will to power: "the disclosure to man of all beings whatsoever as objective, calculable, quantifiable, disposable raw material which is of value only insofar as it contributes to the enhancement of human power."

Furthermore, Heidegger claimed that humanity's quest for world mastery, our valuing of other beings for their use in acquiring this power, represents not only the
culmination of Western scientific culture but the triumph of moral nihilism: "In technological culture, moral distinctions lose their meaning; expediency becomes all important. Language gets debased and becomes mere 'communication,' which gains ease of transmission at the expense of depth..." In making humanity the measure and measurer of all creatures and things, thus rendering them controllable, we have disconnected ourselves from our own ground of Being, that understanding which reveals all the beings of the world as wholly intelligible and relational.

Severed as it is from such spiritual and philosophical inquiry, science has long taken pride in its "purity" and independence from morality, a kind of solitary Cartesian ego detached from the blood and body of the world. But in so accentuating its autonomy, science has increasingly isolated itself from other disciplines and ancient, venerable traditions. Instead of fertile crossovers constantly occurring between the sciences and humanities, we have misunderstanding and mistrust between the two. And in so emphasizing the intellect, with its hardened, unfeeling, mechanistic view of nature, science risks educating Cartesian clones with only a small part of their minds stimulated: the computer.

Traditional science, wildlife biology included, is avoiding great systems of thought, not to mention the
entire right hemisphere of the brain, that which engenders reflection, meditation and creative intuition. The details, the facts, the mechanics are wondrous, yes, but not at the expense of whole vision and meaning. Science is all on one side of the brain, imbalanced and impoverished, and deeply needs both.

This split between the intellect and the emotions, the calculative and the meditative, extends far beyond scientific education and the naturalist's tradition. It is, in fact, a just portrait of the modern psyche, the end product of 2500 years of rootedness in Platonic soils and dualistic philosophies, Christianity included, which succeeded in separating spirit from matter and humanity from nature in caste-like, hierarchical systems. Such dualistic thinking worked to create a psychic split between the mind and heart and the masculine and feminine aspects of one being, personified by the Greek distrust of the emotions, the Stoic philosophies, and culminating in the extraordinarily influential teachings of Rene Descartes and his mechanistic view of nature: the animal as machine.

**Cartesian Ontology**

As mere automaton, animals not only lacked souls in Descartes' hierarchal system of beings, bestowed by God to humans only, but consciousness and feelings as well. For it was Descartes, "Father of modern thought,"
who first established mankind as the ontological center of the universe, claiming that man could and should become "master and possessor of nature," and all the beings therein. "Thus," he wrote, "my opinion is not so much cruel to animals as indulgent to men--at least to those who are not given to the superstitions of Pythagoras--since it absolves them from the suspicion of crime when they...kill animals."¹³

It was precisely in this time period, of course, that experimentation on live animals became widely accepted and practiced, a pursuit which continues to this day in medical laboratories and in the biology labs of grade schools and high schools throughout the world. For if animals lack sentience and consciousness, as the most influential thinker of the era declared, scientists could rationalize any violent act committed against them in the name of research. As with the modern biologist grinding up wild coyotes or dissecting live frogs, such a convenient theory allowed the seventeenth century Cartesians to

...administer beatings to dogs with perfect indifference and make fun of those who pitied the creatures as if they felt pain. They said the animals were clocks; that the cries they emitted when struck were only the noise of a little spring that had been touched, but that the whole body was without feeling. They nailed poor animals up on boards by their four paws to vivisect them and see the circulation of the blood which was a great subject of conversation."
Even the Enlightenment of the eighteenth century, which did give rise to some progress in human relations, failed to enlighten humanity on its relations to animals. Descartes' rationalism was merely refined in this period by Newton and Bacon; also Kant, who reminded his students during his Lectures on Ethics that "so far as animals are concerned we have no direct duties. Animals are not self-conscious and are here merely as a means to an end. That end is man."^{15}

And like the seventeenth century observer of experiments in France who was made fun of for pitying the animals, those who worry about the pain and suffering of wildlife are derided by some contemporaries as victims of the "Bambi syndrome." As one of the biologists wrote, "The pain wild animals suffer in nature is much greater than anything we could inflict on them," apparently unaware of the fact that as self-conscious beings, humans have choices in their acts. We choose to inflict pain, or not. Those modern wildlife researchers who do express dismay at this split in personal feelings vs. the required professional attitude risk alienating themselves from the scientific community at large with its clear historical bias against empathy and emotional expression.

And this is an injunction which emerged long before Descartes and his mechanistic philosophies. Its origins can be traced to Western culture's own Greek perceptions.
and mythologies, to the birth of the warlike Athena from the head—logos—of her father Zeus, and not from the womb of her mother. For this was the time in our history of consciousness that Father culture, with its hardened mask of rationality and conjugal and property rights, was replacing Mother culture as our central mode of being.
Each individual is important and special and every bit as important as the overall population. I try to maintain a scientific objectivity toward each animal on a professional level. But on the personal level I see each wolf as a special creature and feel badly when they are killed.

--Wildlife Ethics Survey

The woman biologist who expressed the above sentiment knows that such feelings are discouraged in her profession. For despite its claim as an amoral system, impersonality and efficiency, utility and detachment are the values of conduct actually prized by science and stressed in its professional training--values which are historically patriarchal in nature and which parallel, not coincidentally, a low regard in our culture not only for animals, but for women, wilderness, and the emotional aspect of our psyches.

This deeply entrenched, centuries-old masculine bias toward logic and reason finds expression in science's present worship of technology, the technology of materialism, which further masks and conceals our intimacy with nature. This bias operates to the almost complete disregard, if not denigration, of the traditionally matriarchal or feminine modes of consciousness which place high value on communication, relationship, the imagination,
and the emotional intuition.*

It is not surprising, therefore, that a clear suggestion of gender dependency appeared in the responses to my ethics and wildlife questionnaire. For although femininity is an expression of being human that can be lived out by both men and women (or suppressed and betrayed by both), it is clear that the feminine principle is not in dominance in our present scientific/world view and that many men, wildlife researchers included, do indeed "suppress and betray" their own feminine ways of knowing.16 A number of the researchers contacted expressed regret and profound self-searching on this very point. For while detachment, efficiency, and utility may remain unquestioned values when dealing with the quarks of physics or the quasars of astronomy, they are disturbing and misplaced values when leveled at the other biological beings with whom we share our earthly home.

These are the same dominant masculine values, of course, which permit the blinding and burning of animals to test cosmetics and household toxics (LD-50 tests) and more recently, patents on research animals--surely the ultimate in utilitarian arrogance. As such, they are operative values which must be aggressively reassessed, from both within and outside the scientific community.

* It is important to note that I use the words "feminine" and "masculine," rather than female and male, to emphasize their unbounded natures.

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With over 90% of the profession comprised of males, wildlife research and management is unquestionably a (white) male dominated profession, and its past and present values reflect that dominance. Likewise, the vast majority of respondents to my questionnaire were male (85%). In fact, so gender-exclusive is this profession that I elected to change my given name to M.J. on the survey in order to avoid any possible bias against women in wildlife. (A strategy which apparently worked as all personal responses were addressed to Mr. Kahn.)

Fortunately, due in part to the growing number of young women entering the field, (still very limited; two women researchers work for the state of Montana, for example), I was able to contact and elicit opinions from 15 female researchers, women whose responses clearly represent "a different voice." And although this number of women represents a relatively small sample size, results strongly support the indication of a dependency between gender and response. As such, I recommend further study of the wildlife profession in order to clarify the significance of this male/female gap in perception and values concerning animals.

Responses by Gender

With wide margins of differences from their male colleagues on several crucial points, the women surveyed
were much more likely to believe that 1) unnecessary research on wildlife is occurring in the field; 2) graduate students in wildlife are not well grounded in the ethical treatment of animals; 3) a stronger professional code of ethics is needed for the wildlife profession; and 4) there is a need for an improved international network of communication to prevent unnecessary research on wildlife. In addition, the women revealed stronger convictions overall regarding the sentience and consciousness of animals, and all the women (100%) discounted the need for a hierarchy of beings regarding the ethical treatment of animals (Table 3).

Nor is this the first time a male/female disparity has appeared in research designed to evaluate human perceptions of animals. The findings of Kellert and Berry (1986) parallel and lend further credence and scientific support to my own, based as they were on a large sample of the American population.

Male vs. female differences in attitudes toward animals were dramatic. The strength and consistency of male vs. female differences were so pronounced as to suggest gender is among the most important demographic influences on attitudes toward animals in our society. 18

The researchers also concluded that one of the most striking contrasts was the higher moralistic attitude scores of the females. In Kellert's system of attitude types (1980), moralistic refers to a "primary concern
for the right and wrong treatment of animals, with strong opposition to exploitation or cruelty to animals." Females also scored consistently higher in the humanistic category, defined as a "primary interest and strong affection for individual animals." Males, by contrast, scored significantly higher on the utilitarian and dominionistic scales, the first defined as a "primary concern for the practical and material values of animals" with a greater willingness to endorse their exploitation; the latter as "a greater tendency to derive personal satisfaction from the mastery and control of animals." Other strikingly consistent results have been found among children (Kress 1975; Pomerantz 1977; Kellert 1985; Frodey-Hutchins 1988), with girls expressing a higher percentage of ethically-based attitudes toward animals and boys a higher percentage of utilitarian attitudes.

In my own research I elected not to be bound by Kellert's nine categories of attitude types, preferring to elicit my own key phrases and trends from the largely subjective essay questions. Thus, in analyzing all the surveys, I arrived at the following most common themes and concerns in response to the statement, "Please describe your personal ethic regarding animal research" (question #14, Table 5).

1) Primary concern for the welfare of the species, population or ecosystem despite the cost to individual animals; i.e., the end justifies the means.
2) **Primary concern for the animals involved;** i.e., the research is second to the well being of the animals.

3) **A belief that intrusive research on animals is necessary or essential for scientific knowledge.**

4) **A belief that alternatives to intrusion should be sought/an active pursuit of those alternatives.**

5) **A concern for the professionalism of one's research:** appropriate methodology, well defined goals, cost/benefit analysis, sound statistical results, etc.

6) **A concern for the humane treatment of animals** during wildlife research.

7) **A belief that extraneous or inhumane research is occurring in the field.**

In nearly equal percentages, both male and female respondents believed that research impacts on animals should be minimized whenever possible (31% to 27%, Table 5). However, nearly twice as many women expressed specific concern for the humane treatment of those animals being handled (27% to 14%). Subtle differences emerged in the language expressing that concern as well. Thus, a typical female response, "The animals are to be treated with dignity and respect, with as little trauma as possible," at first appears quite similar to the male response, "Every effort should be made to minimize discomfort, terror, and pain when handling." But what I began to notice on the second and third readings of the essays were the specific references by the women to the individual animal or animals undergoing stress: "Treat each individual animal as a special, feeling, thinking creature. Minimize
disturbance. Handle/capture only when necessary," as one enjoined. The males, by contrast, did not as often mention the individual animal or its unique life. Their response was more commonly, "Prevent unnecessary harm or death;" or, in the words of one: "Avoid destroying vertebrates."

Thus, the primary concern of the females was more often for the animals involved; the research was seen as secondary to the animals' well being (47% to 7% for males, Table 5). They also expressed a greater preference for alternatives to direct animal research and more often sought and actually employed such alternatives to avoid manipulation, pain, or death (Table 5). One woman testified that she is "constantly searching for ways to conduct non- (or less) intrusive sampling technologies."

My personal ethics have evolved from believing the ends justified the means (learned during my undergraduate days) through various concepts to what it is now: to treat other organisms with respect. I won't kill organisms for my own research and design research that allows this omission. I will, however, use tissues from hunter-killed or otherwise deceased organisms; my philosophy here is similar to my support of donor organ programs--some "good" can come of the death this way.

Another female researcher was willing to be patient for results that took longer to obtain but which saved the lives of hundreds of animals.

I was asked to collect shrews for tissue analysis to determine if they are contaminated. I asked
to wait for the results of the sediment and water analyses before sacrificing 100 or more shrews for analysis. If the water and sediments are not contaminated, then there will be no need to sacrifice the shrews. This means some of the analyses will be postponed for six months, but the project is long-term and so the delay is reasonable.

These two women were the only biologists among nearly 100 who described actual alternatives to animal manipulation and death, a willingness to step outside the traditional rules and modes of thinking and practice innovative, non-intrusive methods of research. While this number cannot be termed statistically significant, it does point to the vast majority of wildlife researchers who, at present, do not seek such alternatives. And although 5% of the males expressed a need for such options, and one practiced an absolute injunction against killing, overall the men were much more likely to defend or justify intrusive research (20% referred to it as "necessary" or "essential" vs. 7% for females), as in the following statements:

It is necessary! Handling, etc. and all ills that may result are essential sacrifices that must be made in order to better understand the species' ecology; from which management may "best" be guided. Without knowledge the potential for disaster is too great--hence it is necessary to perform research on/with/to animals for the good of the population.

An animal's life is often terrifying, extremely stressful and short... Most animal research has
less impact than other unintentional human intrusions and the benefits far outweigh the costs.

I have no problem with sacrificing some animals' lives to get the answer to a serious question that may be impacting populations over a wide range. I regard these test animals as making the supreme sacrifice for the benefit of the species.

Although a number of respondents did recommend pursuing only "valid" or "necessary" research on wild animals (10% of all respondents--only one man offered the belief that "research for research's sake is OK"), few were willing to define these words or grapple with the difficult question of what specifically constitutes necessary vs. unnecessary research. At what point exactly do benefits to the species, population, or ecosystem outweigh costs to the individual animals? What subtle or powerful line must be crossed that suddenly justifies the research in terms of animal lives traumatized or lost? And although there were the expected mandates against killing or harming rare or endangered species ("particularly larger animals of longer life spans," added one male), this question of necessity--what it is, how to put bounds on it--remained largely answered by the biologists, both male and female. One woman did conclude that intrusive research should **significantly** benefit the species in order to be justified.

It was the male researchers, nonetheless, who more
frequently offered examples of unnecessary research occurring in the field. "Too often animals are trapped, drugged, and harassed with no clear purpose evident," one wrote, with three others putting forth similar opinions. Others cited the existence of "frivolous or trivial research," and "research that is...inhumane." Another believes that "Radiotelemetry is considerably overused, often with poorly conceived and implemented projects." And the most intriguing charge of all: "Certainly there is some research conducted that is extraneous, inhumane, and not germane to the goals of wildlife professionals.....However, certain types of research that are grossly inhumane need to be scrutinized very carefully by our profession, because such research is highly inflammatory to certain animal rights groups and also the non-aligned public."

"Needs to be scrutinized"--not because it is unethical, even grossly unethical--but because of a fear of public opinion recognizing and turning against such abuse. This is truly traditional science--amoral, rational, detached--in prime working form. However, others surveyed had no trouble giving such experiments a name: "Research only for the benefit of research is unethical," three biologists insisted; specifically, one noted, "not to use and abuse for academic research interests." Another believes that scientists should be "closely monitored
to prevent long-term pain on individuals." And one researcher was extraordinarily clear on how he viewed such activities: "Scientists who disregard the feelings of individual organisms should be punished."

Although definitely representing a minority (10%) of all males and females responding to the essay, these expressions of concern for known or possible abuses in wildlife research are in no way negligible, for--as noted--the issue is not openly acknowledged or discussed within the profession. Moreover, such responses were not directly elicited, but freely offered in an open-ended essay. When offered as a statement of fact (Table 3), the belief that unnecessary research is occurring in the field gained even greater support (33%). As such, this suggests a significant and perhaps growing concern within the profession for the unethical behavior toward animals of certain peers. One must hope that this kind of concern, grounded in integrity and moral belief rather than defensive posturing, will soon outstrip the other--based on fear of falling out of an informed public's favor. That this fear is mounting within the wildlife profession is evident from the following essay published in the Wildlife Society Bulletin (Winter 1987):

Although animal rights views may seem extreme and unreasonable from the perspective of most wildlife professionals, it should not be assumed that the "neutral majority" shares the typical professional's perspective. Such an assumption
could lead to devastating consequences... we need to ask ourselves whether the neutral majority is more likely to relate to our perspective or that of the animal rightists. It is an anxiety-filled undertaking, but vital to maintaining the credibility of the profession.

In further elaborating on this question of one's personal ethic (essay #14), a considerable number of respondents voiced the belief that research should be professionally conducted. In this regard, male and female scientists were closely aligned (23% vs. 20%, Table 5). Proper preparation, objective and rational decisions, sound methodology, cost/benefit analysis, efficient processing—all such concerns were conveyed, echoing the logical, analytic voice of science. Only two researchers expressed (in their essays) the need for professionals to communicate research results more fully and effectively. "Results should be honestly reported and shared with other researchers in the field," one man wrote. "I do not believe that is always the case." And a woman insisted, "More effort should go into communicating results in journals which are widely read to avoid duplication/replication in research." This concern for increased networks of communication resurfaced in a later question (#16i, Table 3) where women expressed a much greater need for such open and accessible networks of communication "to prevent unnecessary research on wildlife."

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The Factors of Age and Experience

Other than the male/female disparities mentioned, the only other meaningful demographic influences among my respondents appear to be age and years in research. This is largely due to the fact that age and experience may be the only other important demographic differences among wildlife researchers, for the profession consists of a rather homogenous group of highly educated white males. A profile of the average person surveyed reveals a white/Caucasian male in his 40's who has earned a PhD and been in the profession nearly 20 years, now working under the title of Research Biologist or Wildlife Scientist.

Those males with the most years in research (>20) held quite different views than the women concerning questions of ethics and wildlife (Table 4). However, men with 20 years or less experience in research were more often in agreement with their female peers. This affinity emerged in the objective questions but was not borne out in the personal essays. In their written responses the women expressed stronger moralistic and humanistic attitudes toward animals than the less experienced males. These same results held true for males with the least years in research (10 or less) when compared with females of the same category (Tables 4,7,8). The question of attitudes and beliefs as a function of
years in research, rather than gender, is therefore not
distinct, and further study--with a larger sample size--
is warranted. However, it may be impossible to determine
this correlation for many more years, as females with
over 20 years involvement in wildlife research are as
yet a rarity.

Will these young women retain their perceptions and
beliefs regarding animals as their years in the profession
increase? Or will they begin to yield these inner values
to the dominant masculine paradigm? As one remarked in
an interview: "Most of the women I know who have survived
in this field have had to adopt male attitudes to do so."
Despite this opinion, the one female respondent with over
20 years experience strongly upheld her younger colleagues'
attitudes and beliefs (Table 4).

Those beliefs, the existence of unnecessary research
on wildlife and the need for stronger codes of ethics
and networks of communication, diminished sharply among
the oldest males (60+) who were much more likely to agree
or strongly agree with the following statements: 1) There
is no need for a stronger professional code of ethics
for the wildlife profession; 2) Research experiments on
wild animals are rarely unnecessary; and 3) Graduate
students are well grounded in the ethical treatment of
animals. These same men were also more inclined to
strongly disagree with "a need for an improved inter-
national network of communication to prevent unnecessary research on wildlife" (Table 4b).

Moreover, all three of the blatantly negative responses to my survey came from older males (>50). One of these scientists, returning five typed pages of comments rather than the survey itself, found many of the questions on ethics quite "offensive," labeling my list of research techniques as "biased" and insisting that 7 of the 10 methods selected could be termed quite "controversial"; capture, for example, being a more appropriate term than trapping. This same man listed the following methods and technologies used in his own research, electing to characterize them as non-intrusive:

Direct observation, banding, trapping, radio-collaring, killing, snaring, poisoning, periodic monitoring, scat analysis, pesticide analysis, heavy metal analysis, harassment, roost disturbance, track and sign analysis, browse analysis, habitat analysis, scent stations, linear measurements, Literature review, photography, scientific method, harvest analysis, activity recording instruments, computer analysis, radio telemetry, harvest regulation analysis, population census, habitat manipulation, necropsy, live capture, animal restraint, numerous techniques for sex and age determination, aerial surveys, predator control, scare devices, and population manipulation.

One is left to wonder what this man has not done to wild animals in the name of research. Needless to say, this same scientist would have scored high in the utilitarian and dominionistic categories of Kellert's value system,
offering the following quote as proof:

Animals are not known to have intellectual, emotional, cultural, or spiritual capacities, so I have no more attachment to an individual wild animal than I do to a drumstick or a hamburger that I am about to eat.

Surely this is the modern animal researcher's twist on Descartes, "je pense donc je suis détaché"--I think, therefore I am detached--from the rest of the sentient biological world, apparently. Again, and in remarkably clear terms, the patriarchal language of cold logic, separation and control emerges, based on how dissimilar are animals from humans. Indeed, those researchers whose perceptions of animals were largely utilitarian and dominionistic chose to see the differences between human and nonhuman animals (mostly males, Table 6). By contrast, those who more often expressed ethical and humanitarian values elected to perceive the similarities between the two. As one young woman wrote in response to the essay question, "...what does an animal mean to you personally?"

I feel connected by virtue of my own animal nature. Wild animals are symbolic of "wildness"; they are spiritually representative of the relationship of all living and non-living cycles on earth (i.e. flow of energy and its spiritual implications). I seek to understand wild animals to better understand myself and the meaning of life.

This essay turned out to be among the most revealing and fascinating aspects of the entire questionnaire (#16,
Table 6), a source point for understanding and interpreting many of the other responses. For it is the way we experience—or are trained to experience—animals which essentially determines our ethical norms in the sphere of human/nonhuman relations.

**Identification and Connection**

As a way of interpreting the varied, often singular beliefs of the biologists, I sought to pinpoint in their responses the process of *identification*, a process which imparts a deepening sense of connection with other life forms and which parallels an emotional and intellectual maturation of adult human beings, a maturing of consciousness. (And in many ways a return, full circle, to the child within.) In the concluding chapter of *Conservation Biology, the Science of Scarcity and Diversity*, philosopher Arne Naess described the process in these terms:

> Given our biological endowment each of us has the capacity to identify with all living beings. In addition, given the physiological, psychological, and social basis of gestalt perception and apperception, humans have the capacity of experiencing the intimate relations between organisms and the nonorganic world; that is, between the biosphere and ecosphere in general. I take it therefore to be an empirically testable hypothesis that the attainment of well-rounded human maturity leads to *identification with all life forms* in a wide sense of "life" and including the acknowledgment of the intrinsic value of these forms.

Using this concept of maturity and identification as a
theoretical basis for interpreting the essays, I found a high degree of identification with animals among the women and a lesser, but still discernible, identification, among the men. A number of the biologists answering this essay (14%) expressed profound affection, even love, for other animals (Table 6). With such comments as "without them life is fairly worthless" and "what my heart is totally devoted to," the researchers revealed the significance animals hold for them in their personal lives. On a less passionate level, a greater number of researchers expressed the notion that animals add to the quality of life, enriching their experiences or forming the basis of their lifestyles. Male researchers indicated more often that animals supported them intellectually (mental stimulation, curiosity, etc.) and to a lesser degree, emotionally. For women, the reverse held true: the emotional value or meaning of animals was most often cited, followed by their spiritual value. Feelings of awe, humbleness and gratitude were described by a minority of both sexes and for one, "a close to religious experience in the presence of animals."

The biologists also testified that they received aesthetic, cultural and financial value from animals, in that order of frequency. However, most cited of all was the utilitarian value of animals. Nearly a third of the men (31%) deemed this the number one value of animals,
while the women considered it among the least important of all (Table 6). The one woman who did cite utilitarian value referred to our food from domestic animals while male responses in this category ranged from "animals are a renewable resource" to "they are a gift from God that we are to have dominion over, utilize, and sustain." One man, in considering what an animal meant to him personally, wrote simply: "Food, fiber, disease, and a challenge to control its destiny."

Not even one sixth of all researchers answering the essay mentioned the biological fact that humans are animals too (15%, Table 6). From those who did emerged such key phrases as "we're all animals, different but related" and "animals are a kindred spirit, related through evolution." The women, however, were nearly five times (27% to 6%) more likely to point out the often overlooked capacities of mind and emotions in nonhuman animals, perceiving from their own experiences that "animals are feeling beings" that "are less mechanistic than thought," and possessing an intelligence which "continually amazes me." And yet another: "Animals have personalities and emotions. They also have intelligence, more than many people give them credit for." Female researchers were also much more likely to consider all animals "worthy of our respect" (Table 6).

Some respondents went further in their estimation
of animals, placing them, in various contexts, on equal standing with humans (40% to 4%, female/male): "I feel neither inferior nor superior to other animals"; "they are equal to me in needs and feelings"; and "I believe they are every bit as high a life form as are humans."

A few even pondered if some, perhaps all, animals are not actually superior to humans in certain respects: "I think highly of them, sometimes even more so than our own species" with their "sensitivity and adaptability to their environment and a seemingly content satisfaction with having the basic needs of life." As one female biologist reflected:

I question if man's intelligence is just that. No other creatures destroy their air, water, and environment like we do. I sincerely believe some mammals may be more "intelligent" than we are. I don't think most of us give them enough credit. The whole idea of man's dominance over other creatures and the environment has us on the verge of ecological disaster. We have lost our connection to the kindred spirit ideas and beliefs of earlier man. We have forgotten that we too are but animals attempting to survive.

Taking the concept of identification even further, two women noted that they often prefer the company of animals to humans. One wrote: "I feel closer to animals than many people." And although a minority of respondents (6%) supported a rights theory for animals--their unique and important right to exist--it was a sole woman who espoused the intrinsic value of animals, their value in the universal scheme "whether or not I or any other human
Thus, in Naess' conception of maturity and identification, few of my total respondents have attained the full potential of that process, and only one acknowledged the intrinsic value of wild animals, a perception of life and existence "that is not entirely homocentric, but is biocentric in the wide sense of bios." Viewed separately, however, the women researchers expressed to a much higher degree, biological connection and emotional and spiritual identification with animals.
PART THREE

We can only be ethical in relation to something we can see, feel, understand, love, or otherwise have faith in.

--Aldo Leopold
CHAPTER 6

RELATIONSHIP AND RESPONSIBILITY

We have listened for centuries to the voices of men...
yet in the different voice of women lies the truth
of an ethic of care, the tie between relationship
and responsibility, and the origins of aggression
in the failure of connection.

--Carol Gilligan

In a spacious room of vibrant, woven colors, neither
indoors nor out, creatures roam in benevolent abandon.
They are women and animals, linked in evolutionary time
and place, and moving through a world of relation, communi-
cation and connection.*

Such a felt relationship with nonhuman beings is not
unusual in matriarchal societies, nor in the contemporary
art and literature of women. These women are expressing,
with great energy and vividness, a unity with all life that
they have always known, perceived through the powers of
empathy and perception. Regarded as an anomaly of the human
condition and relegated to the category of "mere" female
intuition, such sensibilities have long been devalued by
traditional science, resulting in the present nihilism of
regard for individual animals in research. Stuck in an
intellectual, objective mode of thinking--where scientists
have made themselves the subjects in this world by making
others objects--and severed from other ways of knowing,

* Impressions from an exhibit by fabric artist Nancy Erickson

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science, in its research on animals, leaves no room for the contextual value of living relationships, for the felt connection, through caring and responsibility, for other forms of life.

Moral Development by Gender

In her insightful book of interviews with women, In a Different Voice, Carol Gilligan explodes the longstanding paradigm of human development that regards masculine values (=scientific values) as the cultural norm and feminine values (i.e., non-scientific) as some sort of obscure and undesirable deviation from that norm. Recognizing, as many have before her, that gender is one of the most crucial determinants of human behavior, she also reveals that, prior to her own research, conclusions regarding those behaviors have been drawn almost exclusively from studies conducted by male researchers on, almost entirely, male subjects. Thus, in her groundbreaking work Gilligan lets the women, long silenced, fully speak, revealing quite different ideas about morality, life values, and the human/world condition. In so doing, she dares to write against the inherent masculine bias of the sciences, elevating the values of women to equal and complimentary standing with those of men.

The discovery now being celebrated by men in midlife of the importance of intimacy, relationships, and care is something that women have known from the beginning.24

Because the primary caretaker for both sexes in the
first years of life is usually female, young boys, in perceiving themselves as masculine, "separate their mothers from themselves, thus curtailing their primary empathic tie." As a result, male development involves a more defensive fixing of ego boundaries, a more forceful individuation and separation of self from others. Young girls, however, who see themselves as like their mothers, emerge from this crucial period "with a basis of empathy built into their primary definition that boys do not."\(^{25}\)

Whatever the explanation of its origins, moral development and understanding in males and females clearly take diverging paths. And whether science recognizes nonhuman animals as part of the moral community or not (at present it does not, as evidenced by its willingness to use animals in whatever self-serving manner it sees fit), Gilligan's delineation of male attitudes toward human relations is virtually a mirror image of traditional scientific (i.e., male) attitudes toward human/animal relations: an experience of relationship that has separation, abstraction and aggression at its core; a sense that the individual relationship is replaceable so long as the established system of prescripts continues. Resembling the discoveries of my own research, females questioned by Gilligan were "more tolerant in their attitudes toward rules, more willing to make exceptions, and more easily reconciled to innovations."

While women thus try to change the rules in order to preserve relationships, men, in abiding by these rules, depict relationships as easily replaced.\(^{26}\)
What is being described, of course, is that ancient, impossible chasm between power and compassion--a disparity that emerges not only in human relations but in human/animal relations as well: the desire to transgress and subdue another being against its will vs. the desire to care for the well-being of that other by seeking alternatives to intrusion. Viewed in this perspective, the male understanding of morality is defined by an understanding of the rules and logic of justification (the language of rights) along with the ability to render an interpersonal relation into a theoretical abstraction. The female understanding of morality, however, is based on a clear understanding of the nature of choice, the desire to actively seek a solution most inclusive of everyone's needs, and a belief in a network or web of relations on whose continuation we all depend.

Research on gender differences, Gilligan's included, also notes the abundance of violence in the male subjects' fantasies and story-tellings, "depicting a world of dangerous confrontation." Females, to the contrary, more often esteem non-violence as a major premise of their ethic as well as uphold a firm belief in communication as the sustainer of relations. Such findings reinforce my own: women scientists who saw the need for greater communication within the wildlife profession and who more often sought, and actively created, alternatives to intrusive research. One of my respondents cited examples of what she considers wholly unacceptable intrusion to animals:
A researcher should not unjustly influence an animal's life for his/her benefit, e.g. thesis or paper...Some research such as breaking ducks' wings to see how they will survive w/broken wings is totally absurd. There are some macho men researchers out there that have very little respect or compassion for an individual animal; it is like they are afraid to show gentleness.

"Afraid to show gentleness." Yes, gentleness to other living beings. And empathy, patience, compassion: words that emerged often in the women's essays but dishonorable words in the scientific professions, wildlife included, where students from the onset are discouraged from letting feelings of any sort intrude on their rational decisions--as if appropriate feelings had nothing to do with clear judgments--where the emotions are not even recognized as a valid aspect of the adult psyche, let alone encouraged for usage in research. For it is desensitized, codified, "unbiased" thinking the wildlife profession is after, not an intuitive understanding of and respect for each living being in the web of life.

"Our hearts must be metaphorically cut out of us to do these things to animals," one former researcher confessed in an interview. "You have to rationalize what you are doing or you can't do it. You have to get the feelings out of the way."

"Men put up walls," he continued softly. "That's why they can kill animals." These walls, these mental constructs against empathy and emotion, as he sees them, severed a once wondrous connection between self and nature, a communication known as a child and now suppressed in the "deep lake" of
the subconscious mind. And one which he is working to recover, with new patience, "bucketful by bucketful."

Another male biologist, who also dropped out of research, relates how he initially felt very badly during his work with prairie dogs—inducing torpor and cold stress, resulting in death for many—but he learned to "turn them off" (his feelings), believing, as he had been taught, that there are nobler goals than compassion: "enriching the knowledge of humanity." Knowledge, he added, that may have no foreseeable application but which adds to the data base of science and may some day prove of use to man: "I bought into research on animals. I didn't question it for a long time." Once the questions began, however, a full nine years later, he abandoned a "very fruitful and lucrative" research effort that he claims would have made him famous.

Thus, according to these ex-scientists, the values of abstract conceptual thinking, means/ends justification, peer recognition, and the accumulation of knowledge for knowledge's sake were stressed early in their scientific educations and subsequently pursued in their careers, replacing an original sense of wonder and respect for the individuality and diversity of nature. "They are brainwashed," insists the wife of a recent graduate in wildlife biology who has observed her husband's education closely. Herself a graduate student, she notes that his four years of study did not include one course in human/animal relations or the ethical treatment of animals. "They seldom see living, breathing creatures
any more or the absurdity/cruelty of some research." They see instead, she believes, management theories, principles, projections, and the rewards of professional approbation.

Lack of empathy then--of feelings of relation and connection and concern for other living beings--constitutes a "higher" scientific value in the wildlife profession. The problem with this value, of course, is that it strips powerful, self-originating belief (vs. the spoon-fed variety) from its very origins. For all genuine beliefs spring from original feelings. To deny this is to deny one's own ground of being. In the words of Mary Midgley: "Strong feeling is fully appropriate to well-grounded belief on important subjects. Its absence would be a fault."

What does it mean to say that scruples on behalf of animals are merely emotional...? What else ought they to be? Our emotional life includes the whole range of our feelings, motives and sympathies. This whole range, obviously, is not something which paralyzes thought or any of our other faculties. It is the power-house which keeps the whole lot going...Accordingly, anyone accused of being emotional about injustice or oppression or war or bad science or anything else can quite properly reply, "Of course I feel strongly about this, and with good reason. It is a serious matter. Anyone who has no feeling about it, who does not mind about it, has got something wrong with him."

By evading emotion, by stripping it of its inherent connection to reason and belief, science continues to falter outside the moral realm, particularly in its relations with animals, for "this is the element of truth in Emotivism: morality does require feeling."
In a similar manner, the judicial, traditionally masculine language of competing rights employed in research (human needs vs. others') serves as convenient justification for transgression to animals, both in the laboratory and the wild--i.e., "animals have no rights" or "human rights are greater; therefore, I am justified in my intrusion."

A morality of responsibility, however, does not construct such reasoning for its language and way of thinking are "contextual and narrative," seeking identity through acts of involvement and concern, rather than "formal and abstract," seeking perfection in some abstract ideal--select species, management goals, cost/benefit models, etc.

In brief, the masculine, scientific view of morality, clearly emerging in Gilligan's research as well as my own, celebrates separation over connection, intrusion over inclusion, reason over emotion, and a formal hierarchy of opposing needs and rights vs. a living network of relationships and responsibilities.

Reflection and Totality

It is not my purpose here to degrade masculine values, praising only the feminine; rather to point out how excessive and imbalanced in those patriarchal values the scientific world has become, leading to the almost casual acceptance of highly intrusive, highly aggressive research on animals. And this is not an imbalance of values that will be overcome solely by the growing influx of women into the wildlife
profession--although that trend is surely a hopeful one for animals--but by the internal recognition and integration by individuals, on a profound level, of their masculine and feminine natures.

And it is not only women who lament our present cultural/scientific imbalance: "There is a void felt these days by women--and men--who suspect that their feminine nature, like Persephone, has gone to hell." Although not specifically asked, several male biologists expressed a feeling of loss, of blockage, both in their personal lives and in their work, a sense of some long denied aspect of their being, estranged from their own consciousness, yet potentially fertile and life-affirming.

One such scientist I spoke to at length revealed that he is working hard to reconnect with his feminine aspect, his psyche--or anima--in the language of Jungian psychology. Historically, it is women who have been brought to self-reflection, a search for larger meaning, by the psychic disorientation resulting from centuries of devaluation by a predominately patriarchal world. But this male biologist, in seeking for the first time in his life the solitude and patience that grants receptivity to the unconscious, has also embarked--in midlife--on a journey of self-reflection and remembrance, rediscovering the totality of who he is.

Jung, in clarifying the female and male psychological elements inherent in us all, noted that it often becomes necessary, when systems are imbalanced, to focus wholly
on one side of the original union.

The animus corresponds to the paternal Logos just as the anima corresponds to the maternal Eros... woman's consciousness is characterized more by the connective quality of Eros than by the discrimination and cognition associated with Logos. In men, Eros, the function of relationship, is usually less developed than Logos...[therefore] the anima gives relationship and relatedness to a man's consciousness.

And so, forced by a crisis in his life to do so, this biologist is attempting to fill his feminine void—repressed by the rational, non-feeling aspect of himself—and his life and work, he claims, have become correspondingly "warmer, more alive." Asked to describe his masculine aspect, he called it intellectual and fragmented; his feminine, emotional and wholistic. Accordingly, like Jung—and unlike the present scientific paradigm whose role model of perfection is achieved "by having our rational intellectual process (our will) dominate our emotions and other weaker aspects of our human nature"—he is beginning to have great respect for the emotional intellect, that process which engages both feeling and thought and recognizes their interconnection. "Sensitivity requires rationality to complete it, and vice versa," insists Midgley. "Real scruples, and eventually moral principles, are developed out of this kind of raw material."

And it is by just this process of integration, this "divine syzygy," that women have long examined—with the emotions—their thoughts, consistently finding that the predominately masculine conclusions of our culture, and science, are too small.
The individual animal holds value to the biologist
only as a representation of something beyond and
distinct from it: its species classification.

---Eugene Hargrove

One such "too small" conclusion by the male, scientific
consensus is that other animals--despite our evolutionary
kinship and shared involvement in the earth's community of
life--reside outside our moral consideration and that,
therefore, the immediate reality of living, sentient animals
may be justifiably sacrificed to the abstract principle of
future and desirable species.

In his recent book, *Foundations of Environmental Ethics*
(1989), Eugene Hargrove argues, quite correctly, that 19th
and 20th century biologists have centered their concern for
wildlife on the preservation of species and ecosystems, "not
the interest of the individual animal." He goes on to
defend this contemporary view as aesthetically valid, essen-
tially viable, and virtually unshakeable because it follows
so cleanly the linear progression of our Western tradition:
low regard for the individual animal. And although Hargrove
gives passing nod to the presence of a growing number of
contemporaries who claim that animals are a part of the moral
community and have a right to exist, he argues that science
cannot realistically take on this perspective for it is not in its tradition to do so.

What Hargrove fails to aggressively confront in his timid balancing act of historical precedent and emerging perceptions is 1) science does not progress neatly and linearly, as he so longs for, but in just those revolutions of perception he seems to fear and 2) the cult of species ideology—exalting the species at the sacrifice of animals—is no longer defensible, morally or scientifically, but represents instead an archaic pre-evolutionary concept, a Platonic ghost.

An animal by itself does not mean much to me but it is the animal as part of a natural system that is important—his role in the overall system.

--Male Biologist
Wildlife Ethics Survey

My respondents overwhelmingly confirmed Hargrove's thesis that the naturalist's tradition is one of concern for "species" or "systems" and not animals, in and of themselves. Nearly 50% (Table 4) embraced species classification as the proper method to preserve wildlife and the correct justification for harming or killing animals, as if species were fixed and durable entities, ideal forms that continued through time for our aesthetic and scientific edification.

Moreover, over 60% of the respondents believe the primary obligation of the wildlife biologist is to the ecosystem or species while just 10% believe that obligation belongs to the
animals involved (Table 14). Additionally, 79% stated that their research is of direct benefit to species, with only 7% claiming the same for individual animals (Table 12, B). Humans claimed a higher portion of research benefits than did animals in this question, garnering 13% of the total responses.

Many spoke of the individual animal, not as a living being or creature, but instead as a "component" or "representation" or "symbol" of a properly functioning ecosystem. Paradoxically, it appears to be the species or systems, undeniably abstract, non-living concepts, which are somehow more real, more meaningful to a majority of researchers questioned than the actual living animals. And yet in terms of evolutionary theory, which presumably all modern biologists embrace, there is no fixed Being as such (Species), only individual entities "loosely classifiable under species designations, coming and going through time."\(^34\)

Thus, while species designation is a conceptual ideal, a convenient system for separating and labeling animals (just as race is a convenient way to separate and label humans), the actual properties of a species are forever changing and evolving through time. Species classification, therefore, is in many ways the equivalent of Platonic forms "in which nothing in this world participates."\(^35\) For in Plato's system of thought, the objects and creatures of the sensible world are but approximate and imperfect resemblances of their corresponding conceptual ideals:

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...the objects which science defines, and about which [it] undertakes to prove universally valid conclusions, cannot be the indefinitely variable things of the sensible physical world. There is therefore a supraphysical world of entities, eternal and immutable, and it is these unchanging entities which are the objects with which the definitions and universal truths of exact science are concerned.  

Accordingly, dealing with species as the value—rather than living, present animals and the quality of their lives—allows questions of ethics to be left out, conveniently extending the moral nihilism of traditional science into the biological realm. For how can one behave ethically toward an abstraction?

Darwinian Values

While this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved.

--Charles Darwin

Darwin's real contribution to our present understanding of biology was not evolution (the idea preceded him by several years), but rather, his truly revolutionary concepts of the origin of species and natural selection: nature placing great value on the individual in all his or her uniqueness, regarding each as an attempt at innovation and change. A high degree of individual variation within a species is thus greatly favored by nature, allowing for adaptation to ever changing environmental conditions. To truly embrace the theory of natural selection, then, is to move one's attention and concern
from the non-living abstract category to the living organism, from the ideal of some fixed form (the species) to the real entity, the individual animal being.

Why then does the Platonic ideal, the species concept, still dominate the wildlife profession? And why is such concern for the species not met with equal concern for the individual animals comprising those species? It would appear that the practical influence of Darwin's theory on wildlife protection attitudes--its inherent valuing of the individual--is marginal to non-existent. For if nature is a living laboratory dependent on the genetic uniqueness (and mutations) of individuals for transformation, adaptation and change, why does the wildlife profession hold on to species as the value with such an ironclad grasp?

The truth is that holding on to species classification as the ideal in wildlife preservation, while viewing the individual with all its genetic diversity as dispensable, sanctions the uninterrupted, unchallenged continuation of just those patriarchal values science rewards: detachment, theoretical abstraction, hierarchy and rational control. For it turns out that not just species are favored for protection by the wildlife profession, but certain "select" species as well: those vertebrates, large mammals especially, that afford food, hide, and head to man.

"Preferred" Species

I find it frustrating that in wildlife and fisheries biology, so much more importance is placed on those
species which can be assigned a "price tag": i.e. game
fish and big game.

--Female Biologist
Wildlife Ethics Survey

A recent, quite revealing article in the widely read
Wildlife Society Bulletin presented an opposition's view
of the wildlife profession's research-management system.
Advancing that "the animal rights movement is particularly
disconcerting for most wildlife professionals because it
opposes not only the activities that management makes possible (e.g., hunting and trapping) but also the underlying
assumptions and precepts upon which the profession has been
based," the author proceeded to outline the movement's
perspective for his peers:

The simple version of the scenario presented by animal
rightists is as follows: hunters support wildlife
management agencies financially and politically and the
agencies hire wildlife biologists to manage preferred
species of wildlife to ensure a surplus of these animals
for hunting. This morally warped system, from the animal
rights advocate's perspective, can be stalled by elimi-
nating any element in the system...Poor performance [by
the wildlife profession] is evidenced by the creation
of ecological imbalance, which is the result of promoting
high populations of game animals with little attention
to other species' needs. Wildlife managers accomplish
population management by employing heinous methods, such
as hunting and trapping. And lastly, the wildlife
manager's motives are self-serving--to produce hunting
targets so licenses are sold to keep agencies funded
and jobs secure.37

Astonishingly, after presenting four pages of similar
assaults on the "wildlife-management hunting system," the
author offered no contrary account or defense whatsoever for
that system or its underlying principles. Indeed, the article
reads more like a self-indictment than the confident vindication expected. The resulting sense of the whole issue, though unvoiced, was "Are our precepts valid? Do we have a defense?"

This question of political motivation within the wildlife profession is a crucial one. A full two-thirds of my respondents (66%) agreed, or strongly agreed, with the statement: "Political pressures influence my research."

(Table 3) Asked to elaborate on her positive response during an interview, one biologist explained, "Not the findings per se but the mission itself, the perspective, the questions you are directed to answer on certain species vs. others is definitely influenced by politics. How the researcher presents the findings is influenced as well. This is what really opened my eyes after joining Fish and Wildlife," she continued, "How much politics influences science."

An example of such influence recently went public when the Interior Department released its first internal review of Glacier National Park's research program, a review which was highly critical of the Park's lack of trapping, tranquilizing and radio-collaring grizzly bears to monitor their movements and behavior. Radiotelemetry devices are already being used on bald eagles, wolves, elk, deer and moose in the Park, but thus far grizzlies have been spared the intrusion. Glacier's top research scientist: "The issue really is, 'Do we have questions that require that kind of technology to answer?' Right now I can't say we have the questions."

Obviously, the Interior Department, thousands of miles away
in Washington, thinks they do, and time will reveal whether Glacier's managers and decision makers suddenly decide so, too.

"The manager/researcher interface is a very delicate thing," another Montana-based biologist stated, indicating that the system at present does not work well at all, to the detriment of wild animals. "Very few managers understand research and researchers, more so when they have a politician leaning on them who wants data in two weeks. That's when the abuses start happening, the quick-and-dirty studies." He blames the system as a whole for such abuses--its caving in to political pressures and expediency; also, poor communication within the system and the increased number of researchers overall looking for studies, many of whom have been poorly trained in principled ecology and consequently, implement poor research projects. "There should be a [power] pyramid where researchers can get to the top, not through management only, to discuss, debate and confer with the decision makers." As one ecology-minded researcher noted, speaking of her ongoing efforts to shift the emphasis away from select species management in the Forest Service, "You live in fear, basically, of being ignored."

Toward a Wholistic Approach

As the above dissatisfied researchers have implied, the severe limitations of this select species fixation in wildlife conservation must be flatly, openly addressed. A
few progressive biologists have ventured to do so, although, regrettably, from a scientific standpoint only, rarely if ever a moral one. Such biologists decry the use of "management indicator species" to indicate the state of health of the biotic environment, calling instead for a "...broader approach to biological conservation...to balance the inherent limitations of the species approach." The vast majority of these indicator species, not surprisingly, are exactly those that meet the wildlife profession's historic emphasis on big game production rather than an equality of concern for all the wild beings that together create the earth's biological diversity.

The species approach does not meet the conservation goal of preserving the diversity of all levels of biological organization because it does not explicitly recognize as valuable anything other than... the level of species.38

And although the authors of this statement are arguing for a value recognition of processes above the level of species, the same reasoning may be used for a value recognition of those individuals constituting a particular species classification. For if it is "theoretically possible to preserve all the earth's species and lose the integrity of the higher order patterns and processes," it is also theoretically possible--indeed may already be happening--to preserve all the earth's present species and yet lose the integrity of its individual members, intruded upon and living out their compromised lives.
For example, most of us would find efforts to preserve 200 Kirtland's warblers more valuable than efforts to maintain a million American redstarts... This is, in part, because we do not recognize the unique value of a million birds... There is unique value to the million redstarts; however, we are simply untrained to recognize that value.39

Likewise, biologists are untrained, scientifically and morally, to recognize the unique value of one redstart. For such a recognition would involve a dialogue of ethics, of the scientist's ethical behavior toward animals; and this is exactly the dialogue the wildlife profession has thus far preferred to ignore.
CHAPTER 8

WEIRD SCIENCE: KILLING ANIMALS TO SAVE THEM

There is no end to the quest for knowledge, which, if we do not ask "why" and question our values, can lead us astray into chaos.

--Michael W. Fox

Near Churchill, Canada, on the Western shore of Hudson Bay, Ursus maritimus, polar bears, follow their ancient migration route from sea to shore and back again. Those who wander too close to town, however, are impounded. In windowless 8x12 corrugated-steel huts, these powerful animals, themselves sometimes 8 feet in length, spend up to 100 days in isolation. Their incarceration is part of a biological research and management plan to study the animals, while at the same time protecting people and bears from one another.

For smack in the middle of this ancient migratory route lies Churchill, research haven for hundreds of biologists intensely scrutinizing, analyzing, cataloguing and classifying the entire Hudson Bay population of bears. Working extensively from helicopters, researchers have free-darted and captured over 3,000 polar bears in the past 20 years in their effort to "save" them. One can comprehend the true significance of these numbers only by realizing that polar bears live close to 20 years on average while the entire Churchill population is 1200 bears.
Taking advantage of the available monies [from the Canadian Wildlife Service, the major oil companies, universities, and other sponsors]...biologists intensified their research. They studied the mainline themes of population ecology....And they studied more esoteric questions, such as the significance of supplemental food sources, the effects of new tranquilizing drugs, the effectiveness of the identification of bears through injection of tetracycline into the bloodstream. They tested every conceivable bear deterrent from electrified barbed wire fences to riot guns firing rubber bullets...many were repeatedly injected, using a bewildering variety of drugs, either tranquilizers or immobilizers...the drugs themselves have known harmful side effects. Anectine killed several bears before it was abandoned. Sernylan (known as angel dust on the street) has been implicated in the death of pregnant females. Some drugs immobilize the eyelids and tear ducts...all can kill through overdose. Telazol, a relatively new drug now popular with Churchill biologists, is registered with Canada's Bureau of Dangerous Drugs. 

I quote from the above article at length because it is the only complete documentation--combined with ethical questioning--of biologists' impact on a population of animals that I have found in existence. Not surprisingly, it was published in a non-scientific source. Its author goes on to discuss the possible long-term consequences of such intense handling of bears, noting that one 1986 study "showed a consistent trend toward smaller litters and lighter cubs. Furthermore, ten to thirteen pregnant females handled at dens...abandoned [their cubs] soon after being captured." And yet in 1988 alone, another 400 bears were darted, captured, tagged, painted, measured and molested (for is there any other word for disturbing pregnant, hibernating females in their dens?)--all in the pursuit of more biological data. In the words of Churchill's present chief biologist: "We still know very little."
Dr. Charles Jonkel was the first scientist to study polar bears in Churchill, capturing and tagging animals along the coast in 1966. Today he an outspoken critic of many of the present research efforts in wildlife biology: "By saturation trapping, they have crossed the ethical threshold. There is absolutely no need to trap so many bears. We can learn as much handling far fewer animals." 42

Jonkel also disapproves of the growing number of "beep biologists" in the profession, as calls them. "I quite object to them. Comfortable in their planes with their beep machines, a lot of these scientists never really observe their species, don't know much about their animals at all. Content with getting their numbers, they miss everything: the animals' crises, their interactions with the environment and other species, how bad weather affects them, available food supply, on and on." 43

By walking, Jonkel seems to be saying, one notices everything. It is, in the words of one poet, "the first meditation, the exact balance of spirit and humility." 44 With its motion and immediacy, its possibilities for silence and keen observation, it unites the walker with the land, the terrain—the animals' matrix of being. And in giving up walking in the field, in taking up the machine and its distancing, often air-borne technologies, today's wildlife biologists have also given up one of their primary connections with other animals, the vigorous, sensual use of their bodies and the mindful awareness such use imparts.
Dr. Jonkel goes on to elaborate how harm can be done to bears by chasing them from the air, particularly those at Churchill, pursued as they are during the warmest months of the year, often resulting in overheating. Once drugged, bears may be unable to increase their respiration for cooling, resulting in death. And, as with other darted animals, there are know cases of bears landing with their snouts in inches of water, drowning before the researchers, encumbered by their flying machines, were able to reach them. Jonkel also insists that frequent tagging can alter an animal's personality and behavior.

My own respondents similarly confirmed that their research on wild animals in some way changes the animals' behavior (Table 15). They disagreed, however, on how significant and lasting these behavioral alterations might be. Of the 61% who answered "yes" to the question, "Do you believe your research on animals in any way changes their behavior?" 20% added that the changes were minimal or insignificant. Moreover, three biologists noted that their research was designed to change the animals' behavior; and added one, "Most research is aimed at changing (animal) activity or behavior that conflicts with the public."

Others, however, expressed concern that their research affected study animals in unintended ways (Table 15). Most often cited as cause for concern were the negative effects of radio-telemetry; specifically, mortality among radio-tagged birds; also, aerial surveying (harassment) and live
trapping (accrued wariness). Along with increased aversion to humans, stress to the animal was most often mentioned as an unfortunate consequence of research. As one biologist explained, "Wild animals that are being restrained for the first time are experiencing probably the most stressful thing in their lives."

Another spoke adamantly of the "thoughtless" research behavior that results in harm to non-study animals: "Obsessed with their own little objectives, a lot of secondary fallout is happening, screwing up muskrats while working on beavers, for example. Using a helicopter when they could go on foot. People are almost totally insensitive to secondary fallout to other creatures."

And what of capture, removal from the population or family group, such as the Churchill bears experience sometimes repeatedly? As one biologists wrote, "Captivity changes the behavior of all genetically wild animals." Some animals, after extended capture for study, are even returned to the wild "biologically dead," unable to survive in their own environments, as in the case of desert tortoises taken for research purposes.

The crucial question now for wildlife biologists--now that the behavior of many wild animals has been altered--is, why are we doing this with these particular methods; shall we seek another way? It is the question wildlife researchers have scarcely begun to ask.
A Paradox of Values

Very few researchers, I am confident, would consider stressing an animal outside their line of work. Yet, in the context of research, many appear willing to perform a stunning variety of traumatizing, even mutilating experiments on animals. How are we to account for this discrepancy? What allows sensitive men and women who love animals in their personal lives to cooperate in the field? To grind up the "undesirable" species, net-trap more desirable ones, then write of their acts in voices of utter detachment?

Put in a larger sense, how does an act that appears wrong in isolation suddenly become acceptable in a scientific context? What is the actual source, or mechanism, for this shift in perception?

Recent experiments in human behavior have addressed just these questions. One such famous experiment, first performed at Yale University and repeated worldwide, tested men and women for their willingness to obey instructions given by an authority figure in a situation where they were likely to feel "a personal abhorrence for the actions they were called upon to perform." The results shocked even the administrators of the test: at the insistence of an "authority" in charge, the majority of the subjects (up to 85%) were willing to administer what they believed to be severely painful punishment (450 volts of shock) to other humans, "even in the face of strong personal and moral revulsion."
The question for sociobiology is, why? Is this behavior merely a product of some hard-wired genetic impulse to discharge latent, aggressive energy? Is such aggression found more frequently in males because, as recent theories suggest, men are victims of their own higher levels of testosterone? The more accepted theory proposes that such actions, which in isolation appear wrong, acquire an altogether different meaning when placed in the context of loyalty to a larger authority structure with its strong claim to legitimacy. The scientific community, of course, is just such an orthodox structure, one whose sanctioned usage of animals allows an individual to abdicate his or her personal moral code in service to an institutionalized system of authority.

"It is personally hard for me to interrupt normal behavior patterns and hurt wildlife," writes one researcher. Yet, like most other respondents who expressed personal difficulties with intrusive experiments, he has decided that the end of research—species preservation through continuous data acquisition—justifies the wholly disagreeable means. Apparently, he has decided as well that his own feelings on the matter, though very strong and seemingly appropriate, have no place in the rational decision making processes of research.

Thus, while the preservation of polar bears became a priority in the international wildlife community a full 20 years ago (the first meeting addressing their conservation was held in Fairbanks, Alaska, in 1965), the integrity of
the lives of present polar bears was apparently without equal value. As with so many other examples in the biological literature, the lives of these 1200 bears were wholly, absurdly compromised in the name of scientific acquisition.

Whether or not Churchill's biologists are too consumed by curiosity for the animals' own good, they are, by their actions, at least raising the question of ethics, and some of their work can easily be seen as but another form of human aggression. Consumed with manipulating animals, they are not focusing on other, critical issues--such as the effects of pollution on the bear's food chain.46

What is critical in wildlife research today? The size of each mammalian molar; the number of kilometers covered in a day by surgically implanted, radio-monitored furbearers (usually < 1); or habitat study and acquisition in a rapidly developing world? The "acceptable" mortality figure for each newly designed tranquilizer; or educating the public (and government agencies) on the profound values of biological diversity? Nearly two-thirds of the biologists surveyed (64%) named loss or degradation of habitat as the number one threat to the health and viability of the species on which they do research (Table 8). And yet, only 17% cited protection of habitat as one way in which animals benefit from their research (Table 10). Improved management was by far the number one response to this question of benefit (38%); yet, as we have seen, management in the wildlife profession means basically one thing: emphasis on select species, that is, on select, harvestable species, or those of monetary or
aesthetic value to humankind. As one respondent admonished, "My time--and yours--would be better served fighting for habitat acquisition and improvement." But, as he well knows, the system does not often propel him to operate in such a sensible manner.

The truth is most wildlife research benefits not living animals, but future, desirable species, and one select group above all--man. "We are in a partnership with our research subjects," one wildlife biologist believes (writing in response to essay #14). "Our time, effort and discomfort will lead to a better life for their species and mine."

On paper then, Ursus maritimus, the species, is viable; a protected category whose future as "species" seems secure. But what of the present Ursus maritimus? The sentient, once free-roaming animals whose lives have been repeatedly intruded upon? Whose behavior, even personalities, have been undeniably altered, and by the very biologists who purport to be their defenders? Is an animal who has been repeatedly drugged, painted, tattooed, hung from a helicopter and incarcerated in a 8x12 corrugated hut in any way still wild? Yes, insist the biologists surveyed, 80% of them (Table 3,d). Although manipulated, often more than once, genetically and environmentally these are still wild animals. Yet wildness can be tamed not only through natural selection but through behavioral changes as well. And in a less narrow, i.e., non-scientific sense, where words are granted their full range
of power and meaning, where "wild" implies an integrity of spirit, a way of being, free from outside manipulation, intrusion and alteration, are there any wild animals left where the biologist has been?
The essence of technology is by no means anything technological.

--Heidegger

Now that the land itself is increasingly sterile and paved, our culture's incessant desire to tame the wild has apparently found new outlet in the biotic manipulation of wild creatures. We cannot seem to leave wild alone. We must collar it, track it, plot it, and spread-sheet it until, under our control, we have squeezed every last drop of power and mystery from it. As one research scientist explained, "The ultimate ideal of biology is to mark every single animal and learn everything possible about a population."\(^{47}\)

And the way biologists have found to "learn everything possible" about "every single animal" is through their newly found fascination with, not the animal, but the machine. The allurement of technology for use on animals is everywhere evident in the scientific literature. As our scientific culture moves further and further from animals, worshipped and esteemed in ancient traditions, it replaces them with the tools of technology--deus ex machina--humanity's newest god, the high-tech machine.

Having spent dozens of hours reading bound volumes of the *Wildlife Society Bulletin* and numerous other biological journals, I feel I have learned tremendous amounts about
tools, instruments, and the latest technological devices but very little about animals. The following articles appeared in just one issue of the Bulletin (Winter 1986), selected at random from those volumes used to prepare the list of biologists for surveying:

"Accuracy of helicopter counts of mule deer in pinyon-juniper woodland"
"Accuracy and precision of counting white-tailed deer with helicopters at different sampling intensities"
"Sex and age ratios of shot and trapped California quail"
"Neckband retention in Canada geese"
"The distribution of economic benefits from Alberta duck production"
"Capturing golden eagles using a helicopter and net gun"
"Molar fluting and pelt primeness techniques for distinguishing age classes of muskrats: a reevaluation"
"An electric fence to deter polar bears"
"An acoustic searing device tested against European rabbits"
"Surfactant spray system for controlling blackbirds and starlings in urban roosts"
"Vomiting by feral pigs after 1080 intoxication: non-target hazard and influence of anti-emetics"
"Becoming a hunter: identifying stages of hunting involvement for improving hunter education programs"
"Who owns wildlife?"

Dominating the graphics of the journals are splendidly detailed diagrams and photographs of the various hardware, technologies, and devices utilized on wildlife. Images of animals are rare. Moreover, the names and addresses of the companies selling each device are always included; indeed, company men (Remington Arms Inc., etc.) sometimes co-author those articles featuring their products.

Cost efficiency of handling procedures are given high priority; for example, in an experiment designed exclusively to test costs and mortalities incurred during the trapping
of white-tailed deer by drop-nets, cost/deer was $27.91. "However, if the cost of the hardware is amortized over five years at 10% compounded quarterly and 500 deer are captured during the 5 years at the rate of 2.4/wk, cost/deer would be $21.58." 49

In addition to this constant calculation of the material cost/benefits involved in handling and trapping wildlife, many articles are written in the language of a "manly" hunt--some even taking on the air of a military invasion.

**Methods:** During April 1983-April 1984, we captured mule deer with a hand-held Coda net-gun (Coda Enterprises, Mesa, AZ). The gun discharged an 18-cm mesh triangular net 5.8 m on a side. A .308 caliber charge propelled cylindrical weights attached to each corner of the net. Military OH-58 and UH-1 helicopters were used in all captures. Before takeoff, all doors were removed on the OH-58; the sliding rear door on the UH-1 made it possible for the gunner to open and close the door during flight. The gun was fired from the back seat of both helicopter types. A safety harness and sling system allowed the gunner to lean out past the skids and fire.

Deer were hazed out of pinyon-juniper woodland or off steep slopes and canyon walls and approached for a shot. Deer in vegetative cover or inaccessible areas were followed until they broke into the open, where they were intensively pursued with the helicopter about 3-5 m above ground...shots were fired from a distance of about 3 m.

**Results and Discussion:** Twenty-four deer (9 males, 15 females) were captured on PCMS using the net gun. Haze times varied from 3-26 minutes for all shots and 3-20 min for successful shots...Twenty-one capture attempts were aborted because the deer could not be driven out of the pinyon-juniper cover...The hourly rate charged by the U.S. Army for fuel and maintenance for the UH-1 and the OH-58 was $150.00 and $70.00 respectively. Thus, the average cost for a successful capture with the UH-1 was $17.01 and $12.84 for the OH-58.

The increased power, maneuverability, cargo space, and pilot and gunner comfort of the UH-1 only affected net deployment when the helicopter went into a steep bank during firing...the extra pilot in the UH-1 allowed one pilot to concentrate on the deer while the other watched for obstacles, increasing the margin of safety for the operators.
End of article. End of discussion. Was this a publication about wildlife, about animals? Yes, in a limited sense, but more truthfully it was about military-type helicopters and their comparable comfort, safety, and maneuverability for the pilot and "gunner." It represents a fairly typical example of use of wildlife to test new methods and technologies, the ultimate design or purpose of such testing--benefit to the species, the population, etc.--rarely if ever being discussed. And how appropriate that the men involved in this helicopter chase selected the word "haze" to describe their efforts. Its literal meaning? To harass and subject to humiliation or abusive and ridiculous tricks.

In a similar experiment involving the capture of white-tailed deer ("Drop-Netting Deer: Costs and Incidence of Capture Myopathy"), the sole purpose for netting, blindfolding, and tranquilizing 175 animals was to test and document the injuries, deaths, and costs incurred in the process. As noted by the authors involved, in the nearly 25 years since drop-nets were first used to capture white-tailed deer, "neither the cost efficiency of the technique nor the incidence of capture myopathy, a potentially fatal noninfectious disease related to struggling during capture has been reported."51 In this experiment, a "mere" 7% of the total, twelve animals, died from capture myopathy or, as in the case of one fawn, a dislocated tibial-tarsus joint.

As one wildlife professor conceded, "There are a lot of things done just because they can be done...Please don't make
me come across as holier than thou, because I've done some redundant studies myself. But it's a problem. With the advent of good radiotelemetry, research seems to be technique oriented instead of trying to answer a question."

As the high tech world of research becomes ever more accessible and attractive to biologists in the field, researchers are concentrating more and more on the "process and paraphernalia of the machine and ever less on their relationship with nature." Coming as it does between human and animal, ever distancing the two, technology—the machine as intermediary—serves to veil all ancient, venerable connections. Researchers are "having an affair with a gadget," as one biologist claims, gadgets which they are increasingly testing on the last remaining wildlife in their final biotic playground, planet earth.

Thus, when Martin Heidegger wrote that the essence of technology is nothing technical, he meant, quite simply, that its essence, instead, is power. "In the course of Western history, logos changes from the event of the manifestation of beings to an instrument by which man gains control over the forces of nature." The logic of our scientific culture has emerged as the "logic of domination," the drive to master nature, where only those subjects which can be precisely measured and quantified with the aid of instruments—known and controlled—gain admission to valued status in consensus reality.
Thinkers such as Heidegger (and notably, Marcuse) have been criticized for failing to delineate a clear distinction between science and technology, and indeed, they consistently refuse to make such a differentiation. While acknowledging that the various sciences have exposed astounding details about the world in which we live, they nonetheless insist that one of primary motives of science has always been power.

Perhaps it is just as the poet says: the more repressed the unconscious, the more nature, and wilderness, are feared. With ever ingenious methodology, modern humans seem compelled to manage, track, collar, and control every aspect of wild nature, reducing and diluting it into ever more manageable forms because we fear it, fear its power. Ultimately, of course, it is something within ourselves we fear, our own wild mystery, our own ground of being and its truths. For it is only when something is missing within our own interiors—wise order and benevolent control, humility, and the drawing of a quiet breath—that we seek to control others. We must be masters of other creatures only when we have not yet learned to be masters of ourselves.

And so as a culture we long for wildness yet at the same time we make certain to subdue it. And biologists appear to hold an equally ambiguous attitude toward wild animals—respecting them yet willing to dissect them, revering them as symbols while transgressing them as individuals.
He who knows the masculine but keeps to the feminine will be in the whole world's channel.

--Lao Tsu
We are discussing no small matter, 
but how we ought to live. 
--Socrates

An ethic to live by that has no words for animals and 
our relationship to them is incomplete. For a true ethic-- 
one with wholistic, contextual meaning--involves all the 
members of the community in which one participates and 
partakes. And if anyone should comprehend the community of 
life, bios, with its profound and elegant interdependencies 
and connections, it is biologists.

More than 40 years ago Aldo Leopold proposed such an 
ethic, one involving not only our relationship to the land 
but to the plants and animals upon it. He viewed this ex- 
tension of the ethical realm as an "evolutionary possibility 
and an ecological necessity," one which would place limits 
on our freedom of action in the biotic struggle for existence.

All ethics so far evolved rest upon a single premise: 
that the individual is a member of a community of 
interdependent parts. His instincts prompt him to 
compete for his place in that community, but his 
ethics prompt him also to co-operate....The land 
ethic simply enlarges the boundaries of the communi- 
ty to include soils, water, plants, and animals.... 
It implies respect for [our] fellow-members, and 
also respect for the community as such. 55

Although biologists profess to esteem Leopold and his
philosophies (his land ethic was quoted several times in the survey, Table 18), in actuality his advanced way of thinking has had little impact on the professional institutions. A Leopoldian, ecological ethic has not yet been translated into praxis, or action. For traditional science, reflecting (perhaps defining) the culture at large, has thus far chosen not to include animals--or any other members of the biological community--in its limited ethical realm, perpetuating a narrow system of anthropocentric concerns.

Even the Wildlife Society Code of Ethics, cited by 35% of my respondents as the code they follow, does not once mention the word "animals" nor does it discuss their humane, respectful treatment by biologists (42% were not aware of any code of ethics for their profession, Table 18). Thus, rather than forging a leadership role in this important and timely issue, it seems clear from its own literature that the wildlife profession prefers to ignore it, limiting its discussion of the biologists' impacts on their study subjects to "discreetly confessed tales" in the back halls of international conferences. Of course, such discretionary confessions, far from the public forum, are wholly in line with historical precedent, for modern science has consistently refused to recognize nonhuman animals as worthy of moral regard, valued members of the community of life. Like the culture at large, its relation to animals remains largely utilitarian and economic, involving human privileges but not human responsibilities.
However, it has not always been so. In the history of modern *Homo sapiens*, roughly dated from the mitochondrial Eve, our present inferior regard for animals emerges as an anomaly in a 200,000 year tradition of kinship and respect. Ironically, it was the original scientists, the shamans of the ancient world, who proliferated a sacred view of animals and recognized our profound human/animal connections, a world view which endures among contemporary shamans in dispersed, often isolated areas of the earth. Dressed in skins of Deer or hidden behind masks of Wolf, these wise healers/tricksters enter at will the animal/spiritual world and *become* the animal they dance, tapping into the mysterious powers of the species in an attempt to gain knowledge and universal truths. Unlike many modern scientists, shamans have no need to invade and manipulate the outer world of nature to discover its secrets, for they hold no fear of delving into the fertile labyrinths of their own psyches and minds, believing as they do that each of us contains all the future and all the past and all understanding.

The animals too, they know, are wise—our first teachers (a tradition not completely lost as we allow animals, dressed in trousers and skirts, to be our children's primary instructors in storybooks and tales). As such, they revere all living creatures, recognizing the extreme virtue of lithe, beautifully adapted bodies totally integrated with mind, beings moving whole and complete through the natural world and possessing powers of the senses that far exceed our own.
For these early scientists, probers of the universe, the journey into the animal world was not one of confrontation, a sharpening of technological swords, but always and foremost a journey of transformation, a reaffirmation of the biological and psychological community of all living beings: mind in nature. Because these early ancestors considered all of the natural world intelligent and alive, abounding with energy and consciousness, they honored and respected it as such—animal and river, mountain and tree—in their acts and in their languages. Certain native American tribes, in fact, had no separate words for humans and animals. And this sacred view of nature also emerged in their mythologies, never mere stories, as moderns tend to dismiss them, but psychic facts, symbolic expressions of our inner realities and spiritual potentials.

Not surprisingly, shamans are both men and women and often, both at once. Androgynous figures, they comprehend the necessity of bringing the masculine and feminine principles into harmony, and they understand that this fusion is accomplished in one way only, through the heart—the very energy center conspicuously missing from the body of contemporary technological science. For it is in this physical and psychic center of each being that empathy and compassion arise, spontaneous and all-encompassing. And bigger than the scientist's program.

The poet Coleridge once said that the truly great mind is androgynous. And until science itself becomes whole--
knowing the masculine, keeping to the feminine—it will accomplish nothing that is great, only isolated and fragmented understanding, sharpening its needless tools in ever self-annihilating attempts to control. For whatever shall happen to the animals, shall happen to us. The web of life, of consequences is too intricate, too complete. And since humankind is not necessarily the most intelligent or even intriguing product of the evolutionary process, will the universe return our deeds to us? It is fair game to imagine some "superior" species of the future which, like ourselves, will regard itself as such, thinking nothing of probing, dissecting, and manipulating the human race to satisfy its own intellectual curiosity and need to control. Perhaps, like the other animals—whose modes of communication are impenetrable to us, though they serve the needs of the species beautifully and completely—our language too will be incomprehensible and thus, our existence regarded as inferior, available for use. Naturally, such a scenario could come to pass only if such a future species were as dominant in masculine, utilitarian values as our own and as void of heart in its treatment of other forms of life.

It is time, therefore, that wild nature and its myriad creatures be liberated from the domination and mastery of masculine values. For the recovery of our moral relations with animals is in great part a recovery of our feminine values as a culture, a blending and fusing with the masculine to return balance and harmony to our relations with the entire
biotic community. And it is a recovery of our spiritual values as well, a reshaping of myth, and a recognition that all cannot be seen with the eye or measured and probed with the machine. And it is a recognition that the human intellect in isolation--gray matter, cerebrum--does in fact know very little of the mystery of life, science alone even less, and that there are other, esteemed paths to knowledge and it behooves us to accept that understanding with wonderment and delight. And it is the shaman once again--the poets, philosophers and non-traditional, i.e., transformed scientists--who will lead us on this path to wholeness.

A number of progressive thinkers in ecology and quantum physics have already embarked on this necessary path. Those in the biological disciplines will inevitably follow. But they must begin now to scrutinize their profession and its imbalances or they will be forced to do so by an intelligent, increasingly educated public--and sensitive young wildlife researchers as well--newly conscious, in the midst of an increasingly broken and exploited planet, of humanity's ties and responsibilities to others. If not willing to confront this issue, the wildlife community will find itself maneuvering a position, not from a center of moral strength, but as a profession put on the defensive by emerging imperatives.
Relearn the alphabet,
relearn the world, the world
understood anew only in doing, under­
stood only as
looked-up-into out of earth,
the heart an eye looking,
the heart a root
planted in earth.
Transmutation is not
under the will's rule.

—Denise Levertov

Relearning the world of wildlife research means relearning,
or learning for the first time, an attitude of compassion,
responsibility and restraint, an ethic revealed both in
language and deed. It means relearning the respect and wonder
felt as a child for all that live, move and breathe upon the
planet. And it means, in precise workable terms, a low-impact
philosophy of research, where the study, the intrusion and
the results are second to the well-being and quality of life
of the animals involved. The natural outcome of such a philo­
sophy will be an ongoing, active search for non-intrusive,
low-technological methods of research.

In order to speed science on its way to a wholistic em­
brace of life and universal spirit, I have compiled an array
of recommendations for the wildlife profession in pursuit
of this low-impact principle regarding wild animals and the
transmutation of heart which, hopefully, will precede it.
Perhaps the best one can anticipate, however, is a gradual change of heart accompanied by a regulated change in experimental design.

The first important questions the wildlife profession must ask itself: Are these particular methods essential for informed, intelligent observation of wildlife? Are all these invasive experiments on wild animals necessary? Since 33% of those researchers questioned believe they are not (Table 3a), it is reasonable to assume unnecessary research on wildlife is occurring in the field. Of course, we will never be able to assign statistics to such research, nor know how flagrantly needless some of it may have been, for no outside group or internal committee has ever monitored science's experiments on wildlife, investigating their validity or overall impact on animals. At present, the institution of wildlife study has no common process by which these issues can even be considered.

Therefore, my first recommendation is a call for an Ethics Advisory Board on the national or international level, composed of both scientists and non-scientists and established for the purpose of setting ethical guidelines for biologists working with wildlife in the field. The nature of ethics is such that we will never have one final set of rules, but guidelines for moral behavior are indeed possible. In fact, they are imperative and the real discredit to the wildlife profession is that such a guideline regarding the treatment of animals has not yet been incorporated into its educational
system and formal codes of conduct.

I would like to see the following principles included in such a broad-based, ethical guideline to be used by all wildlife biologists:

1) **A first principle of non-intrusion and non-harm.** Alternatives to capture and manipulation of wild animals must always be sought.

2) **Such intrusions are valid only when the experiment is of clear and significant benefit** either to the animals involved or the species (population) and no low-impact alternatives are available.

3) **Invasive research conducted for frivolous reasons or solely to benefit the researcher** (his or her thesis, graduate credits, professional status, etc.) are unethical and should be condemned as such.

4) **Researchers who abuse their relations with wild animals,** who cause their pain, suffering or deaths without valid scientific/moral reason should be suspended and/or removed from work with animals.

5) **A workable definition of what constitutes "necessity" and "validity"** in wildlife research must be debated and clarified.

6) **All necessary research on wildlife must be undertaken with the highest regard** for the integrity and well-being of the animals involved.

7) **Only the most humane methods of research will be employed** on any wild animals, i.e., those which cause minimal or no pain, suffering, and trauma.

8) **An attitude of responsibility, caring and respect** should be cultivated by all wildlife biologists who work directly with wild animals in the field.

9) **Such an attitude of relation and responsibility** is to be fostered in biologists throughout their training—from grade school through graduate work. The archaic, mechanistic approach to animals used in the educating of scientists (dissection, manipulation, etc.) must give way to an integrative education which emphasizes the wholistic concepts of ecology, evolution, and the inviolate value all living beings.

10) **Universities and other institutions of higher education**
are encouraged to offer coursework in human/animal relations as well as the ethical treatment of animals (the responsibilities of the biologist), to be required of all students in wildlife.

In addition to such an Advisory Board--promoter of low-impact technology and wholistic education--I envision each university or organization which conducts research on wild animals establishing its own ethical review board. Due to intense public outcry (and the passing of the Animal Welfare Act), such boards are now in operation at institutions conducting research on laboratory animals, and the same must be created for research on animals in the wild. These review boards, composed of women and men from the humanities as well as the sciences, are especially critical for such institutions as the Forest Service and U.S. Fish, Wildlife and Parks where the majority of field biologists are now employed (and the majority of experiments are conducted). All research proposals would be examined by such review boards within the individual organizations--much as journal publications are now adjudged by peers--which would scrutinize and judge each proposal for its scientific and ethical validity, paying particular attention to possible detrimental impacts on the study subjects involved.

In the ideal world of biologist/animal relations, it would also be mandatory for all research organizations to file accepted proposals and ensuing results with a national or international computerized information network. Such a comprehensive network of communication, easily accessed by
most personal computers, would serve as a clearing house for advice and information on prior research for a particular species or population. Such a computerized, highly accessible network of information might well serve to alleviate certain duplicate, unnecessary research. As one respected professional recently noted, "Many wildlife biologists do not see well beyond the borders of their own state or province, and the resultant redundancy and waste of effort are enormous. 'It hasn't been done here before' should not be offered as justification by a research biologist..."56

And since the Wildlife Society is the professional organization most recognized and followed by wildlife biologists, I strongly advise that its own brief Code of Ethics be enlarged to include tenets of ethical behavior toward animals. The moment has arrived for this organization--and the institution of wildlife study as a whole--to usher itself into the modern biological era, acknowledging humanity's evolutionary and community kinship with other animals and our inherent ethical responsibilities therein.

And it is time, most importantly, for this issue to be brought into the public forum. Those concerned with the ethical treatment of wildlife must work to establish an ongoing national debate to set limits on the behavior of biologists and force acknowledgment of the moral consequences of their actions. This is a debate which must be taken up among wildlife researchers as well, and not as a mere scientific or management "phenomenon" but as an ethical issue of critical
importance to the integrity of their profession. "The moral
dilemma is the proper place to be right now," one former
researcher believes. "People ought to be tormented in their
own minds and souls before they do research on animals.
Unless they're tormented, I don't think they're doing any
moral consideration."57

Of course, I am not naive enough to believe that the
scientific community will embrace my recommendations over­
night, nor that such regulations and boundaries will even
create the necessary attitude for revolutionary change in
its perception and treatment of wildlife. As one respondent
indicated, "All the rules in the world will not affect the
researcher who chooses to be cruel to animals."

However, I am hopeful enough to believe in the ever ex­
panding consciousness of the human race. Enough groundswell
of concern for the ethical treatment of all animals exists,
both within and outside of the scientific professions, for
a real metamorphoses of attitude and action to indeed be
possible. Changes this past decade in the ethical treatment
of lab animals evidence an accruing awareness that our
responsibilities for moral behavior extend beyond the human
realm. And the newest of the researchers/managers, most
certainly the growing number of women entering the field,
give me real cause to believe that such a transformation of
caring and concern is inevitable within the wildlife profes­
3
sion, a transmutation "not under the will's rule" but under
the jurisdiction of the heart.

98
My heart, my mother;
my heart, my mother!
My heart of transformations.

--The Egyptian Book of the Dead

To effect such a transformation within the wildlife profession will not be easy. The obstacles are formidable, and I have confronted many of them in this discussion: political and economic pressures fueled by a narrow, utilitarian view of animals; species fixation management that favors select, big game species over biological diversity and the intrinsic worth of all wild life; and a system of education and training that habituates young scientists to a mechanistic, objectified use of animals. Nor does it help to live in a culture whose regard for nature is equally anthropocentric and utilitarian, the greatest good for the greatest number of people, "good" invariably being defined in a material sense. We want to make use of nature, of animals, and such an attitude of use, without modifying considerations, always brings destruction.

What we have been constructing of course, severance by severance--and even as we watch other species in the web of life fall to extinction--is our own destruction. But I am still hopeful. Forced by extreme crises to do so, it appears that we are finally, again, beginning to view ourselves as part and parcel of the natural world rather than the world as separate, ours. And although modern science has gone to great lengths to make certain that no animals enter and upset its system of human-based values, encouraging signals
are now emanating from the biological professions, suggesting that system is indeed being shaken. With greater frequency, ecology-minded teachers are taking their young students out into the field for firsthand experience of living organisms interacting with their environments, and notices around campuses and in the halls of high schools inform students of their right to refuse to dissect animals in biology labs. Moreover, a preliminary guideline to field research, entitled "Acceptable Field Methods in Mammalogy" (1987), has at last been distributed by the American Society of Mammalogists, a branch of wildlife study that "has been begging for guidelines and regulations more than any discipline with which I have been associated," as one biologist observed. And although it does not go nearly far enough in calling for the humane treatment of mammals and alternatives to capture and invasive research, this guideline is a first, hopeful step in that direction.

A recent article in The Animals' Agenda (December 1989) also offers encouragement to those who believe the wildlife profession has overstepped ethical boundaries in its pursuit of ever new technologies for research. Dr. Jay E. Kirkpatrick, associate professor of physiology at Eastern Montana College, reveals that much information about an animal's physiology—reproduction, nutrition, behavior, stress, contaminants, etc. —now collected by means of capture, drugs, and other highly technical methodologies, is actually available, or soon will be, through analysis of urine samples and fecal matter.
David Mech...advanced this non-capture approach by utilizing urine-soaked snow. He followed free-ranging wolves in northeastern Minnesota and collected urine-soaked snow adjacent to deer carcasses....Once again, no animals were captured or disturbed, yet valuable information was collected....In order to study oil pollution off the California coast, and more recently in Prince William Sound, [Michael Fry] studied reproductive function in Cassin's Auklets and other seabirds....In one study, he collected 1450 fecal samples during the breeding season and measured corticosterone, testosterone, estradiol, and progesterone. Since the reproductive process is extremely sensitive to environmental contaminants, this non-capture technique has proved very valuable.59

It does seem ironic that such simple and seemingly obvious methods were not tested first; however, given humankind's love of gadgetry, technology and invasion, it is not altogether surprising. And as Dr. Kirkpatrick adds, somewhat less optimistically than in presenting his findings:

"Additional research in the coming years will expand the capabilities, but the well-being of many wildlife species and an expanded understanding of their biology will depend upon scientists' willingness to try these new methods."60

Apparently this scientist also has reservations about the wildlife profession's cheerful readiness to accept such radically "new" methods as fecal and urine analysis. Such methods are, after all, highly non-technological and highly non-intrusive. They wouldn't even require a military-type helicopter, rocket net, or dart gun to deploy them. They demand, moreover, a return to the body, and the feet that carry and the hands that search, a return on equal ground to the animals' domain, the "looked-up-into out of earth." They are, in fact, downright humbling.
For we are battling something larger here than misguided use of technology; we are battling human arrogance. Although such an attitude may exist in only a minority of researchers on animals ("food, fiber, disease and a challenge to control its destiny"), it is exactly this more aggressive quality that appears to overshadow quieter humility; and in wildlife management and wildlife politics, it is the one that calls the shots.

Yet such arrogance and acts of superiority and aggression are but modern side shows in the 200,000 year main event of tolerance and respect for nonhuman animals. And the time will come, ushered in by the contemporary shamans of science and poetry, when our present disrespectful use of animals--the dolphin as war machine, the beaver as surgically-implanted tool for data collection--will appear a perverse aberration in the moral development and enlightenment of humankind. And this era, this madness, this deviation from ancient tradition will be known as the time in our history of consciousness when humans revered life forms and life rituals, but not life itself.

According to many it's impossible, a wild dream, this return, this remembering of our own internal harmony and totality, our profound ties to nature. Science will never return to a low-technological stance, they claim. We are technology; technology now creates the culture, no longer the other way around.
If true, we are severely unenlightened--stuck again in a measuring, calculative mode of existence--and headed straight for hell. But it is not true; an "ecology of mind" is once more emerging on earth, a recognition of the intrinsic worth and beauty of all beings, interconnected in that delicate, resilient web called life. And the time is indeed right in the history of human/animal relations to relearn the language, relearn the earth--to rename the sacred. For there is a tendency for every extreme to transform suddenly into its opposite. Known as "enantiodromia" in psychology, this psychic law of energy plays itself out again and again in the affairs and attitudes of humankind. "There is no hallowed custom," wrote Jung, "that cannot on occasion turn into its opposite, and the more extreme a position is, the more easily may we expect an enantiodromia, a conversion of something into its opposite."\textsuperscript{61}

Is it conceivable for wildlife experimentation to reach a more extreme state of intrusion and disrespect? With video cameras installed in prairie dog burrows and radio-transmitters implanted in the anuses of river otters, I think not. We must now swing, pendulum-like, from such an excess of utilitarian, patriarchal values to an opposing ethic of cooperation and care. And the transformation in the wildlife profession may already be underway as it returns, albeit slowly, to the patient world of respectful following and intent listening, to the living in/with/out of the animal's world; ("I prefer to let the animals tell me what to do in
my research," one wise biologist wrote). It is returning to the simplicity of careful observation and "being-with," to the unpretentiousness of urine and excrement.

We live in a needy age, wrote Heidegger. We are in need "of a kind of conversion which would grant us a new vision of reality, free us from the will to power, from the tendency to look at all things as commodities, and open us to our most authentic possibility, which is to allow beings in the world to manifest their own intrinsic worth." 62

New, that is controversial, thinkers in the sciences have their own name for such a radical conversion of basic values: revolution by paradigms, "the tradition-shattering complements to the tradition-bound activity of normal science [whose] research efforts are strenuous and devoted attempts to force nature into the conceptual boxes supplied by professional education." 63 In his widely influential book, The Structure of Scientific Revolutions, Thomas Kuhn goes on to note that such a paradigm switch occurs only after a crisis of confidence in the old values and an extraordinary period of self-questioning and re-evaluating of the research method: "It is no accident that revolutions in science are preceded and accompanied by fundamental philosophical analyses of the contemporary research tradition...and always by those youngest and newest to the field."

The transfer of allegiance from paradigm to paradigm [masculine to feminine values in the case of animal research] is a conversion experience that cannot be forced...Lifelong
resistance will be felt, particularly from those whose productive and lucrative careers have committed them to an older tradition of normal science...[i.e., animals have no rights; we have no moral responsibilities toward animals] ...stubborn and pigheaded...but conversions will occur a few at a time until, after the last holdouts have died, the whole profession will again be practicing under a single, but now different, paradigm. 64 (my inclusions)

The history of scientific revolutions bodes well for the future of animal research. For old men and young women rarely see the world with the same set of eyes. And if, as Kuhn believes, scientists live and work in a different world following a conversion of values, let us hope that after this coming revolution of consciousness, animals too will live and move through a different world.

For I believe animals are telling us what they think of our present traditions in research--and humanity, and the wildlife profession, are nearly ready to listen. And although wild animals cannot speak, in our terms, for themselves, I do believe they are speaking to us in their own manner. In their changed behavior, in their inability to adapt to captivity, in their suffering and in their deaths, they are telling us quite clearly what they think of our highly intrusive research.

And if it is indeed humankind's destiny is "to fulfill consciousness as highly as possible, to give the universe an eye to look at itself with, an eye to realize itself with....it's clear that a high technology is not necessary for the whole, contemplative, experiential side of that." 65
As science moves ever closer to its past, embracing without fear the meditative, feminine ways of knowing of the heart, blending them with the calculative, quantifiable ways of the will, it will again come to respect nonhuman animals as our moral and spiritual equals, worthy of the highest regard. And rather than seeking interference and conflict, such biologists of the future will aspire to a more advanced, more cooperative way of being, to species intercommunication and connection--their patient, non-intrusive methods reflecting the distinction between a fragmented mind trying to order the universe and the universe ordering a fragmented mind. And the result will be clarity, wisdom and meaning, in our world and in our relations to nonhuman animals, living as they are in a world inseparable from our own.
### APPENDIX

**TABLE 1.** Response Rates: Ethics in Wildlife Research Questionnaire, October 1989.

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<th>No.</th>
<th>%</th>
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<tr>
<td>Surveys mailed</td>
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<td></td>
</tr>
<tr>
<td>Returned &quot;undeliverable&quot;</td>
<td>7</td>
<td></td>
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<tr>
<td>Presumed received</td>
<td>198</td>
<td>100</td>
</tr>
<tr>
<td>Surveys returned</td>
<td>103</td>
<td>52</td>
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<tr>
<td>Not useable</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Useable surveys</td>
<td>99</td>
<td>50</td>
</tr>
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</table>

**TABLE 2.** Frequency Distribution of Demographic Variables by Gender.

<table>
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<tr>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>84</td>
<td>15</td>
<td>99</td>
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</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-30</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>31-40</td>
<td>33</td>
<td>10</td>
<td>43</td>
</tr>
<tr>
<td>41-50</td>
<td>31</td>
<td>1</td>
<td>32</td>
</tr>
<tr>
<td>51-60</td>
<td>13</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>&gt;60</td>
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<td>0</td>
<td>5</td>
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<table>
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<th>Totals</th>
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</thead>
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<td>BA/BS</td>
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<td>8</td>
</tr>
<tr>
<td>MA/MS/MEd</td>
<td>25</td>
<td>10</td>
<td>35</td>
</tr>
<tr>
<td>PhD/EdD</td>
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<td>3</td>
<td>56</td>
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</table>

<table>
<thead>
<tr>
<th>Current title or position</th>
<th>Male</th>
<th>Female</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Biologist</td>
<td>50</td>
<td>12</td>
<td>62</td>
</tr>
<tr>
<td>Professor</td>
<td>28</td>
<td>1</td>
<td>29</td>
</tr>
<tr>
<td>Student</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Not given</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>Male</th>
<th>Female</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>White/Caucasian</td>
<td>82</td>
<td>15</td>
<td>97</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Not given</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years Involved in Research</th>
<th>Male</th>
<th>Female</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2-5</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6-10</td>
<td>10</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>11-15</td>
<td>25</td>
<td>4</td>
<td>29</td>
</tr>
<tr>
<td>16-20</td>
<td>19</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>&gt;20</td>
<td>29</td>
<td>1</td>
<td>30</td>
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</tbody>
</table>
**TABLE 3.** Frequency Distribution and Percentages (in parentheses) by Gender, Question #15. * NR=No Response

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>No Opinion</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Research experiments on wild animals are rarely unnecessary.</td>
<td>1 (07)</td>
<td>3 (20)</td>
<td>2 (13)</td>
<td>8 (53)</td>
<td>1 (07)</td>
<td>0 (00)</td>
<td>10 (12)</td>
</tr>
<tr>
<td>b) There is no need for a stronger professional code of ethics for the wildlife profession.</td>
<td>0 (00)</td>
<td>2 (13)</td>
<td>5 (33)</td>
<td>5 (34)</td>
<td>3 (20)</td>
<td>0 (00)</td>
<td>10 (12)</td>
</tr>
<tr>
<td>c) Graduate students are well grounded in the ethical treatment of animals.</td>
<td>0 (00)</td>
<td>1 (07)</td>
<td>4 (27)</td>
<td>8 (53)</td>
<td>2 (13)</td>
<td>0 (00)</td>
<td>2 (02)</td>
</tr>
<tr>
<td>d) An animal that is drugged, radio-collared, and continuously monitored is still wild.</td>
<td>2 (13)</td>
<td>9 (60)</td>
<td>2 (13)</td>
<td>2 (13)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>27 (32)</td>
</tr>
<tr>
<td>e) Animals have sentience.</td>
<td>5 (33)</td>
<td>7 (47)</td>
<td>2 (13)</td>
<td>1 (07)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>14 (17)</td>
</tr>
<tr>
<td>f) Mammals are more deserving of ethical treatment than amphibians.</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>11 (73)</td>
<td>4 (27)</td>
<td>0 (00)</td>
<td>1 (01)</td>
</tr>
<tr>
<td>g) Animals have consciousness.</td>
<td>5 (33)</td>
<td>7 (47)</td>
<td>1 (06)</td>
<td>1 (07)</td>
<td>1 (07)</td>
<td>0 (00)</td>
<td>16 (19)</td>
</tr>
<tr>
<td>h) Political pressures influence my research.</td>
<td>3 (20)</td>
<td>9 (60)</td>
<td>1 (06)</td>
<td>1 (07)</td>
<td>1 (07)</td>
<td>0 (00)</td>
<td>21 (25)</td>
</tr>
<tr>
<td>i) There is a need for an improved international network of communication to prevent unnecessary research on wildlife.</td>
<td>4 (27)</td>
<td>4 (27)</td>
<td>6 (40)</td>
<td>1 (06)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>4 (05)</td>
</tr>
</tbody>
</table>
### TABLE 3b. Chi Square Test for Independence by Gender, Question #15:
Frequency Distribution, Percentages (in parentheses) and Significance*.

<table>
<thead>
<tr>
<th>Agree</th>
<th>Disagree</th>
<th>NO/NR</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Research experiments on wild animals are rarely unnecessary.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>4 (27)</td>
<td>9 (60)</td>
<td>2 (13)</td>
</tr>
<tr>
<td>Male</td>
<td>45 (54)</td>
<td>24 (29)</td>
<td>15 (17)</td>
</tr>
<tr>
<td>b) There is no need for a stronger professional code of ethics for the wildlife profession.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>2 (13)</td>
<td>8 (54)</td>
<td>5 (33)</td>
</tr>
<tr>
<td>Male</td>
<td>35 (42)</td>
<td>31 (37)</td>
<td>18 (21)</td>
</tr>
<tr>
<td>c) Graduate students are well grounded in the ethical treatment of animals.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1 (07)</td>
<td>10 (66)</td>
<td>4 (27)</td>
</tr>
<tr>
<td>Male</td>
<td>28 (33)</td>
<td>37 (44)</td>
<td>19 (23)</td>
</tr>
<tr>
<td>d) An animal that is drugged, radio-collared, and continuously monitored is still wild.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>11 (74)</td>
<td>2 (13)</td>
<td>2 (13)</td>
</tr>
<tr>
<td>Male</td>
<td>69 (82)</td>
<td>6 (07)</td>
<td>9 (11)</td>
</tr>
<tr>
<td>e) Animals have sentience.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>12 (80)</td>
<td>1 (07)</td>
<td>2 (13)</td>
</tr>
<tr>
<td>Male</td>
<td>58 (69)</td>
<td>4 (05)</td>
<td>22 (26)</td>
</tr>
<tr>
<td>f) Mammals are more deserving of ethical treatment than amphibians.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0 (00)</td>
<td>15 (100)</td>
<td>0 (00)</td>
</tr>
<tr>
<td>Male</td>
<td>13 (15)</td>
<td>60 (72)</td>
<td>11 (13)</td>
</tr>
<tr>
<td>g) Animals have consciousness.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>12 (80)</td>
<td>2 (14)</td>
<td>1 (06)</td>
</tr>
<tr>
<td>Male</td>
<td>55 (65)</td>
<td>7 (09)</td>
<td>22 (26)</td>
</tr>
<tr>
<td>h) Political pressures influence my research.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>12 (80)</td>
<td>2 (14)</td>
<td>1 (06)</td>
</tr>
<tr>
<td>Male</td>
<td>54 (64)</td>
<td>23 (27)</td>
<td>7 (09)</td>
</tr>
<tr>
<td>i) There is a need for an improved international network of communication to prevent unnecessary research on wildlife.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>8 (54)</td>
<td>1 (06)</td>
<td>6 (40)</td>
</tr>
<tr>
<td>Male</td>
<td>28 (34)</td>
<td>35 (41)</td>
<td>21 (25)</td>
</tr>
</tbody>
</table>

*Note: Significance levels <.10 disprove independence.  
Categories "Agree" and "Disagree" include responses of "Strongly Agree" and "Strongly Disagree" for the purposes of this table.  
Category "NO/NR" includes responses of "No Opinion" and "No Response."
TABLE 4. Frequency Distribution and Percentages (in parentheses) Based on Years in Research, Question #15. *NR=No Response

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>No Opinion</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>NR*</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Research experiments on wild animals are rarely unnecessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female&lt;10</td>
<td>0 (00)</td>
<td>1 (12.5)</td>
<td>1 (12.5)</td>
<td>5 (62.5)</td>
<td>1 (12.5)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Male &lt;10</td>
<td>0 (00)</td>
<td>2 (18.0)</td>
<td>1 (09.0)</td>
<td>5 (45.0)</td>
<td>3 (27.0)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Female&gt;20</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>1 (100)</td>
<td>0 (00)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Male &gt;20</td>
<td>5 (17)</td>
<td>10 (35)</td>
<td>3 (10)</td>
<td>6 (21)</td>
<td>2 (07.0)</td>
<td>3(10)</td>
</tr>
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</table>

b) There is no need for a stronger code of ethics for the wildlife profession.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>No Opinion</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>NR*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female&lt;10</td>
<td>0 (00)</td>
<td>1 (12.5)</td>
<td>3 (37.5)</td>
<td>3 (37.5)</td>
<td>1 (12.5)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Male &lt;10</td>
<td>1 (09)</td>
<td>2 (18.0)</td>
<td>3 (27.0)</td>
<td>4 (36.0)</td>
<td>1 (09.0)</td>
<td>0(00)</td>
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<tr>
<td>Female&gt;20</td>
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<td>0 (00)</td>
<td>0 (00)</td>
<td>1 (100)</td>
<td>0 (00)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Male &gt;20</td>
<td>4 (14)</td>
<td>12 (42)</td>
<td>2 (07)</td>
<td>9 (31)</td>
<td>1 (03)</td>
<td>1(03)</td>
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</table>

c) Graduate students are well grounded in the ethical treatment of animals.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>No Opinion</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>NR*</th>
</tr>
</thead>
<tbody>
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<td>0 (00)</td>
<td>2 (25)</td>
<td>6 (75)</td>
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<td>0(00)</td>
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<tr>
<td>Male &lt;10</td>
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<td>0 (00)</td>
<td>8 (73)</td>
<td>1 (09)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Female&gt;20</td>
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<td>0 (00)</td>
<td>0 (00)</td>
<td>1 (100)</td>
<td>0 (00)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Male &gt;20</td>
<td>1 (03)</td>
<td>15 (52)</td>
<td>2 (07)</td>
<td>9 (31)</td>
<td>1 (03)</td>
<td>1(03)</td>
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</tbody>
</table>

d) An animal that is drugged, radio-collared, and continuously monitored is still wild.

<table>
<thead>
<tr>
<th></th>
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<th>Agree</th>
<th>No Opinion</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>NR*</th>
</tr>
</thead>
<tbody>
<tr>
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<td>5 (62.5)</td>
<td>1 (12.5)</td>
<td>1 (12.5)</td>
<td>0 (00)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Male &lt;10</td>
<td>3 (27.0)</td>
<td>6 (55.0)</td>
<td>1 (09.0)</td>
<td>1 (09.0)</td>
<td>0 (00)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Female&gt;20</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>1 (100)</td>
<td>0 (00)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Male &gt;20</td>
<td>9 (31)</td>
<td>15 (52)</td>
<td>3 (11)</td>
<td>1 (03)</td>
<td>0 (00)</td>
<td>1(03)</td>
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</table>

e) Animals have sentience.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>No Opinion</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>NR*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female&lt;10</td>
<td>4 (50)</td>
<td>3 (38)</td>
<td>1 (12)</td>
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<td>0 (00)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Male &lt;10</td>
<td>2 (18)</td>
<td>5 (46)</td>
<td>0 (00)</td>
<td>1 (09)</td>
<td>0 (00)</td>
<td>3(27)</td>
</tr>
<tr>
<td>Female&gt;20</td>
<td>1 (100)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Male &gt;20</td>
<td>8 (28)</td>
<td>18 (62)</td>
<td>1 (03)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>2(07)</td>
</tr>
</tbody>
</table>

f) Mammals are more deserving of ethical treatment than amphibians.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>No Opinion</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>NR*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female&lt;10</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>7 (88)</td>
<td>1 (12)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Male &lt;10</td>
<td>0 (00)</td>
<td>3 (27)</td>
<td>0 (00)</td>
<td>6 (55)</td>
<td>2 (18)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Female&gt;20</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>1 (100)</td>
<td>0(00)</td>
</tr>
<tr>
<td>Male &gt;20</td>
<td>0 (00)</td>
<td>3 (10)</td>
<td>4 (14)</td>
<td>9 (31)</td>
<td>12 (42)</td>
<td>1(03)</td>
</tr>
</tbody>
</table>
TABLE 4 CONT.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>No Opinion</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>NR*</th>
</tr>
</thead>
<tbody>
<tr>
<td>g)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female&lt;10</td>
<td>3 (37)</td>
<td>5 (63)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
</tr>
<tr>
<td>Male &lt;10</td>
<td>1 (09)</td>
<td>7 (64)</td>
<td>1 (09)</td>
<td>1 (09)</td>
<td>0 (00)</td>
<td>1 (09)</td>
</tr>
<tr>
<td>Female&gt;20</td>
<td>1 (100)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
</tr>
<tr>
<td>Male &gt;20</td>
<td>11 (38)</td>
<td>12 (41)</td>
<td>4 (14)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>2 (07)</td>
</tr>
</tbody>
</table>

h) Political pressures influence my research.

|        |                |       |            |          |                   |     |
| Female<10 | 2 (25)        | 5 (62.5)| 1 (12.5)  | 1 (12.5) | 0 (00)            | 0 (00) |
| Male <10  | 6 (55)        | 2 (18.0)| 1 (09.0)  | 2 (18.0) | 0 (00)            | 0 (00) |
| Female>20 | 0 (00)        | 1 (100)| 0 (00)     | 0 (00)   | 0 (00)            | 0 (00) |
| Male >20  | 5 (17)        | 14 (48)| 1 (04)     | 5 (17)   | 3 (10)            | 1 (04) |

i) There is a need for an improved international network of communication to prevent unnecessary research on wildlife.

|        |                |       |            |          |                   |     |
| Female<10 | 3 (37.5)      | 2 (25)| 3 (37.5)   | 0 (00)   | 0 (00)            | 0 (00) |
| Male <10  | 2 (18.0)      | 4 (36)| 1 (09.0)   | 2 (18)   | 2 (18)            | 0 (00) |
| Female>20 | 0 (00)        | 0 (00)| 1 (100)    | 0 (00)   | 0 (00)            | 0 (00) |
| Male >20  | 0 (00)        | 7 (24)| 6 (21)     | 7 (24)   | 5 (17)            | 4 (14) |

TABLE 4b. Frequency Distribution and Percentages (in parentheses) for Males over 60 Years of Age, Question #15.

<p>| | | | | | | |
|        |                |       |            |          |                   |     |
| a)     | 1 (20)         | 3 (60)| 0 (00)     | 0 (00)   | 0 (00)            | 1 (20) |
| b)     | 0 (00)         | 2 (40)| 1 (20)     | 1 (20)   | 0 (00)            | 1 (20) |
| c)     | 0 (00)         | 3 (60)| 1 (20)     | 0 (00)   | 0 (00)            | 1 (20) |
| d)     | 0 (00)         | 3 (60)| 1 (20)     | 0 (00)   | 0 (00)            | 1 (20) |
| e)     | 2 (40)         | 2 (40)| 0 (00)     | 0 (00)   | 0 (00)            | 1 (20) |
| f)     | 0 (00)         | 1 (20)| 0 (00)     | 3 (60)   | 0 (00)            | 1 (20) |
| g)     | 2 (40)         | 2 (40)| 0 (00)     | 0 (00)   | 0 (00)            | 1 (20) |
| h)     | 0 (00)         | 2 (40)| 1 (20)     | 1 (20)   | 0 (00)            | 1 (20) |
| i)     | 0 (00)         | 1 (20)| 0 (00)     | 0 (00)   | 2 (40)            | 2 (40) |</p>
<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Male&lt;40</th>
<th>Female&lt;40</th>
<th>Male&gt;40</th>
<th>Female&gt;40</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Primary concern for the benefit of the species (population), ecosystem or man, i.e., the cost to the individual is outweighed by possible future benefits.</td>
<td>36 (43)</td>
<td>3 (20)</td>
<td>17 (49)</td>
<td>3 (20)</td>
<td>19 (39)</td>
<td>0 (00)</td>
<td>39 (39)</td>
</tr>
<tr>
<td>2) Primary concern for the animals involved; i.e., research is secondary to their well being.</td>
<td>6 (07)</td>
<td>7 (47)</td>
<td>0 (00)</td>
<td>6 (40)</td>
<td>6 (12)</td>
<td>1 (100)</td>
<td>13 (13)</td>
</tr>
<tr>
<td>3) Expressed belief that intrusive research on wild animals is necessary, acceptable, or essential.</td>
<td>17 (20)</td>
<td>1 (07)</td>
<td>9 (26)</td>
<td>1 (07)</td>
<td>8 (16)</td>
<td>0 (00)</td>
<td>18 (18)</td>
</tr>
<tr>
<td>4) Alternatives to animal research are preferred.</td>
<td>4 (05)</td>
<td>3 (20)</td>
<td>2 (06)</td>
<td>3 (21)</td>
<td>2 (04)</td>
<td>0 (00)</td>
<td>7 (07)</td>
</tr>
<tr>
<td>Alternatives are actively sought and employed.</td>
<td>0 (00)</td>
<td>2 (13)</td>
<td>0 (00)</td>
<td>2 (13)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>2 (02)</td>
</tr>
<tr>
<td>5) Expressed concern for the professionalism of their research: proper preparation, sound methodology, cost/benefit analysis, etc.</td>
<td>18 (21)</td>
<td>3 (20)</td>
<td>10 (29)</td>
<td>2 (14)</td>
<td>8 (16)</td>
<td>1 (100)</td>
<td>21 (21)</td>
</tr>
<tr>
<td>6) Expressed concern for the humane treatment of animals being handled.</td>
<td>12 (14)</td>
<td>4 (27)</td>
<td>6 (17)</td>
<td>3 (21)</td>
<td>6 (12)</td>
<td>1 (100)</td>
<td>16 (16)</td>
</tr>
<tr>
<td>Minimize research impacts on animals whenever possible.</td>
<td>26 (31)</td>
<td>4 (27)</td>
<td>11 (31)</td>
<td>4 (29)</td>
<td>15 (31)</td>
<td>0 (00)</td>
<td>30 (30)</td>
</tr>
<tr>
<td>7) Expressed belief that inhumane or abusive research is occurring in the field.</td>
<td>8 (10)</td>
<td>2 (13)</td>
<td>7 (20)</td>
<td>1 (07)</td>
<td>1 (02)</td>
<td>1 (100)</td>
<td>10 (10)</td>
</tr>
</tbody>
</table>
TABLE 6. Frequency Distribution and Percentages (in parentheses) by Gender and Age, Essay #16: "Aside from your professional stance, what does an animal mean to you personally, in an intellectual, emotional, cultural, or spiritual sense?"

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Male&lt;40</th>
<th>Female&lt;40</th>
<th>Male&gt;40</th>
<th>Female&gt;40</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Expressed strong affection or love for animals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 (13)</td>
<td>3 (20)</td>
<td>5 (14)</td>
<td>3 (20)</td>
<td>6 (12)</td>
<td>0 (00)</td>
<td>14 (14)</td>
</tr>
<tr>
<td>2) Expressed the belief that animals add to the quality of life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>23 (27)</td>
<td>7 (47)</td>
<td>9 (26)</td>
<td>6 (43)</td>
<td>14 (29)</td>
<td>1 (100)</td>
<td>30 (30)</td>
</tr>
<tr>
<td>Utilitarian value provided:</td>
<td>26 (31)</td>
<td>1 (07)</td>
<td>13 (37)</td>
<td>1 (07)</td>
<td>13 (27)</td>
<td>0 (00)</td>
<td>27 (27)</td>
</tr>
<tr>
<td>Intellectual value/meaning:</td>
<td>15 (18)</td>
<td>2 (13)</td>
<td>6 (17)</td>
<td>2 (14)</td>
<td>9 (18)</td>
<td>0 (00)</td>
<td>17 (17)</td>
</tr>
<tr>
<td>Emotional value/meaning:</td>
<td>9 (11)</td>
<td>4 (27)</td>
<td>3 (09)</td>
<td>4 (29)</td>
<td>6 (12)</td>
<td>0 (00)</td>
<td>13 (13)</td>
</tr>
<tr>
<td>Spiritual value/meaning:</td>
<td>9 (11)</td>
<td>3 (20)</td>
<td>3 (09)</td>
<td>3 (21)</td>
<td>6 (12)</td>
<td>0 (00)</td>
<td>12 (12)</td>
</tr>
<tr>
<td>Aesthetic:</td>
<td>8 (10)</td>
<td>1 (07)</td>
<td>2 (06)</td>
<td>1 (07)</td>
<td>6 (12)</td>
<td>0 (00)</td>
<td>9 (09)</td>
</tr>
<tr>
<td>Cultural:</td>
<td>6 (07)</td>
<td>1 (07)</td>
<td>6 (07)</td>
<td>1 (07)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>7 (07)</td>
</tr>
<tr>
<td>Financial:</td>
<td>3 (04)</td>
<td>0 (00)</td>
<td>1 (03)</td>
<td>0 (00)</td>
<td>2 (04)</td>
<td>0 (00)</td>
<td>3 (03)</td>
</tr>
<tr>
<td>3) Expressed the recognition that humans are animals too.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13 (15)</td>
<td>2 (13)</td>
<td>3 (09)</td>
<td>2 (14)</td>
<td>10 (20)</td>
<td>0 (00)</td>
<td>15 (15)</td>
</tr>
<tr>
<td>4) Expressed the belief that animals are feeling/intelligent beings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 (06)</td>
<td>4 (27)</td>
<td>1 (03)</td>
<td>4 (29)</td>
<td>4 (08)</td>
<td>0 (00)</td>
<td>9 (09)</td>
</tr>
<tr>
<td>5) Animals are worthy of our respect.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 (11)</td>
<td>6 (40)</td>
<td>5 (14)</td>
<td>5 (36)</td>
<td>4 (08)</td>
<td>1 (100)</td>
<td>15 (15)</td>
</tr>
<tr>
<td>6) Animals are equal to humans in value and importance.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 (04)</td>
<td>6 (40)</td>
<td>1 (03)</td>
<td>6 (43)</td>
<td>2 (04)</td>
<td>0 (00)</td>
<td>9 (09)</td>
</tr>
<tr>
<td>7) Animals have intrinsic value, regardless of human perception.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 (00)</td>
<td>1 (07)</td>
<td>0 (00)</td>
<td>1 (07)</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>1 (01)</td>
</tr>
</tbody>
</table>
TABLE 7. Frequency Distribution and Percentages (in parentheses) by Gender and Years in Research, Essay #14: "Please describe your personal ethic regarding animal research."

<table>
<thead>
<tr>
<th></th>
<th>Male &lt;10 years</th>
<th>Female &lt;10 years</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Primary concern for the benefit of the species (population), ecosystem, or man, i.e., the cost to the individual is outweighed by possible future benefits.</td>
<td>7 (64)</td>
<td>2 (25)</td>
<td>9 (47)</td>
</tr>
<tr>
<td>2) Primary concern for the animals involved; the research is secondary to their well-being.</td>
<td>2 (18)</td>
<td>5 (63)</td>
<td>7 (37)</td>
</tr>
<tr>
<td>3) Expressed the belief that intrusive research on wild animals is necessary or essential.</td>
<td>4 (36)</td>
<td>0 (00)</td>
<td>4 (21)</td>
</tr>
<tr>
<td>4) Belief that alternatives to animal research are preferred.</td>
<td>1 (09)</td>
<td>4 (50)</td>
<td>5 (26)</td>
</tr>
<tr>
<td>Alternatives are actively sought and employed.</td>
<td>0 (00)</td>
<td>1 (13)</td>
<td>1 (05)</td>
</tr>
<tr>
<td>5) Expressed concern with the professionalism of their research: proper preparation, sound methodology, cost/benefit analysis, etc.</td>
<td>4 (36)</td>
<td>2 (25)</td>
<td>6 (32)</td>
</tr>
<tr>
<td>6) Expressed concern for the humane treatment of the animals being handled.</td>
<td>0 (00)</td>
<td>1 (13)</td>
<td>1 (05)</td>
</tr>
<tr>
<td>Minimize research impacts on animals whenever possible.</td>
<td>6 (55)</td>
<td>3 (38)</td>
<td>9 (47)</td>
</tr>
<tr>
<td>7) Expressed the belief that inhumane or abusive research is occurring in wildlife study.</td>
<td>2 (18)</td>
<td>1 (13)</td>
<td>3 (16)</td>
</tr>
</tbody>
</table>
TABLE 8. Frequency Distribution and Percentages (in parentheses) by Gender and Years in Research, Essay #16: "Aside from your professional stance, what does an animal mean to you personally, in an intellectual, emotional, cultural, or spiritual sense?"

<table>
<thead>
<tr>
<th></th>
<th>Male &lt;10 years</th>
<th>Female &lt;10 years</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Expressed strong affection or love for animals.</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
</tr>
<tr>
<td>2) Expressed the belief that animals add to the quality of life.</td>
<td>7 (64)</td>
<td>5 (63)</td>
<td>12 (63)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Totals</td>
</tr>
<tr>
<td>Utilitarian value:</td>
<td>2 (18)</td>
<td>0 (00)</td>
<td>2 (11)</td>
</tr>
<tr>
<td>Intellectual value:</td>
<td>2 (18)</td>
<td>1 (13)</td>
<td>3 (16)</td>
</tr>
<tr>
<td>Emotional value:</td>
<td>2 (18)</td>
<td>3 (38)</td>
<td>5 (26)</td>
</tr>
<tr>
<td>Spiritual value:</td>
<td>1 (09)</td>
<td>3 (38)</td>
<td>4 (21)</td>
</tr>
<tr>
<td>Aesthetic:</td>
<td>1 (09)</td>
<td>1 (13)</td>
<td>2 (11)</td>
</tr>
<tr>
<td>Cultural:</td>
<td>0 (00)</td>
<td>1 (13)</td>
<td>1 (05)</td>
</tr>
<tr>
<td>Financial:</td>
<td>0 (00)</td>
<td>0 (00)</td>
<td>0 (00)</td>
</tr>
<tr>
<td>3) Expressed the recognition that humans are animals too.</td>
<td>1 (09)</td>
<td>2 (25)</td>
<td>3 (16)</td>
</tr>
<tr>
<td>4) Expressed the belief that animals are feeling/intelligent beings.</td>
<td>1 (09)</td>
<td>4 (50)</td>
<td>5 (26)</td>
</tr>
<tr>
<td>5) Animals are worthy of our respect.</td>
<td>1 (09)</td>
<td>2 (25)</td>
<td>3 (16)</td>
</tr>
<tr>
<td>6) Animals are equal to humans in value and importance.</td>
<td>0 (00)</td>
<td>3 (38)</td>
<td>3 (16)</td>
</tr>
<tr>
<td>7) Animals have intrinsic value, regardless of human perception.</td>
<td>0 (00)</td>
<td>1 (13)</td>
<td>1 (05)</td>
</tr>
</tbody>
</table>
**TABLE 9.** Frequency Distribution and Percentages (of Total Respondents): Key Research Techniques, Question #1. *

<table>
<thead>
<tr>
<th>Technique</th>
<th>Frequency (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct observation</td>
<td>87 (87)</td>
</tr>
<tr>
<td>Trapping</td>
<td>78 (78)</td>
</tr>
<tr>
<td>Radio-collaring</td>
<td>73 (73)</td>
</tr>
<tr>
<td>Banding</td>
<td>63 (63)</td>
</tr>
<tr>
<td>Marking/Tattooing</td>
<td>48 (48)</td>
</tr>
<tr>
<td>Darting/Drugging</td>
<td>47 (47)</td>
</tr>
<tr>
<td>Extraction</td>
<td>38 (38)</td>
</tr>
<tr>
<td>Surgical Techniques</td>
<td>19 (19)</td>
</tr>
<tr>
<td>Satellite Tracking</td>
<td>9 (09)</td>
</tr>
<tr>
<td>Other</td>
<td>16 (16)</td>
</tr>
</tbody>
</table>

**TABLE 10.** Frequency Distribution and Percentages (of Total Respondents): Species or Groups Studied, Question #2. *

<table>
<thead>
<tr>
<th>Species/Groups</th>
<th>Frequency (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ungulates</td>
<td>29 (29)</td>
</tr>
<tr>
<td>Birds</td>
<td>27 (27)</td>
</tr>
<tr>
<td>Waterfowl</td>
<td>14 (14)</td>
</tr>
<tr>
<td>Small mammals</td>
<td>14 (14)</td>
</tr>
<tr>
<td>Bears</td>
<td>11 (11)</td>
</tr>
<tr>
<td>Game Birds</td>
<td>10 (10)</td>
</tr>
<tr>
<td>Wolves</td>
<td>8 (08)</td>
</tr>
<tr>
<td>Rare, Endangered or Threatened Species</td>
<td>8 (08)</td>
</tr>
<tr>
<td>Carnivores</td>
<td>7 (07)</td>
</tr>
<tr>
<td>Furbearers</td>
<td>6 (06)</td>
</tr>
<tr>
<td>Rodents</td>
<td>5 (05)</td>
</tr>
<tr>
<td>Cervids</td>
<td>4 (04)</td>
</tr>
<tr>
<td>Bighorn Sheep</td>
<td>3 (03)</td>
</tr>
<tr>
<td>Mountain Goats</td>
<td>2 (02)</td>
</tr>
<tr>
<td>Other</td>
<td>18 (18)</td>
</tr>
</tbody>
</table>

**TABLE 11.** Frequency Distribution and Percentages (of Total Respondents): Greatest Threat to Species Studied, Question #2. *

<table>
<thead>
<tr>
<th>Threat</th>
<th>Frequency (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat Loss or Degradation</td>
<td>64 (64)</td>
</tr>
<tr>
<td>Poor hunting regulations/overharvesting</td>
<td>-14 (14)</td>
</tr>
<tr>
<td>Human Caused Mortality</td>
<td>10 (10)</td>
</tr>
<tr>
<td>No Immediate Threats</td>
<td>9 (09)</td>
</tr>
<tr>
<td>Pollution/Contaminants</td>
<td>8 (08)</td>
</tr>
<tr>
<td>Human Encroachment</td>
<td>7 (07)</td>
</tr>
<tr>
<td>Timber Harvesting</td>
<td>3 (03)</td>
</tr>
<tr>
<td>Other</td>
<td>10 (10)</td>
</tr>
</tbody>
</table>
### TABLE 12. Frequency Distribution and Percentages (of Total Respondents): Biologists' Characterization of Their Research, Question #4.

<table>
<thead>
<tr>
<th>Characterization</th>
<th>% (Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Important to Species Viability</td>
<td>43 (43)</td>
</tr>
<tr>
<td>Highly Important</td>
<td>33 (33)</td>
</tr>
<tr>
<td>Beneficial</td>
<td>20 (20)</td>
</tr>
<tr>
<td>No Response</td>
<td>3 (03)</td>
</tr>
<tr>
<td>B. Of Direct Benefit to the Species</td>
<td>79 (79)</td>
</tr>
<tr>
<td>Beneficial Mainly to Humans</td>
<td>13 (13)</td>
</tr>
<tr>
<td>Of Direct Benefit to the Individual Animal</td>
<td>7 (07)</td>
</tr>
<tr>
<td>No Response</td>
<td>0 (00)</td>
</tr>
<tr>
<td>C. Less Intrusive to the Animal</td>
<td>52 (52)</td>
</tr>
<tr>
<td>Not Intrusive</td>
<td>26 (26)</td>
</tr>
<tr>
<td>Highly Intrusive</td>
<td>19 (19)</td>
</tr>
<tr>
<td>No Response</td>
<td>2 (02)</td>
</tr>
</tbody>
</table>

### TABLE 13. Frequency Distribution and Percentages (of Total Respondents): How Animals Have Benefited from Research, Question #5. *

<table>
<thead>
<tr>
<th>Benefit</th>
<th>% (Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Improved Management</td>
<td>38 (38)</td>
</tr>
<tr>
<td>2) Increased Public Awareness, Understanding via Education</td>
<td>25 (25)</td>
</tr>
<tr>
<td>3) Protection of Habitat</td>
<td>17 (17)</td>
</tr>
<tr>
<td>4) Data/Knowledge Base</td>
<td>14 (14)</td>
</tr>
<tr>
<td>5) Identification of Habitat</td>
<td>14 (14)</td>
</tr>
<tr>
<td>6) Lowering Human-Induced Mortality Rates</td>
<td>12 (12)</td>
</tr>
<tr>
<td>7) Protection of Nesting and Roosting Sites</td>
<td>12 (12)</td>
</tr>
<tr>
<td>8) Improvement or Acquisition of Habitat</td>
<td>11 (11)</td>
</tr>
<tr>
<td>9) ID of Limiting Factors</td>
<td>9 (09)</td>
</tr>
<tr>
<td>10) Reintroduction of Species</td>
<td>7 (07)</td>
</tr>
<tr>
<td>11) Monitoring of Mortalities</td>
<td>7 (07)</td>
</tr>
</tbody>
</table>

### TABLE 14. Primary Obligation of Wildlife Biologists: Frequency Distribution and Percentages (of Respondents), Question #6. *

<table>
<thead>
<tr>
<th>Obligation</th>
<th>% (Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) To the Ecosystem/Natural Processes</td>
<td>43 (43)</td>
</tr>
<tr>
<td>2) To the Species</td>
<td>18 (18)</td>
</tr>
<tr>
<td>3) To the Public</td>
<td>14 (14)</td>
</tr>
<tr>
<td>4) To the Animals Involved</td>
<td>10 (10)</td>
</tr>
<tr>
<td>5) To my Profession</td>
<td>9 (09)</td>
</tr>
<tr>
<td>6) To my Agency</td>
<td>1 (01)</td>
</tr>
<tr>
<td>7) Other (to the resource, knowledge base or objective science)</td>
<td>10 (10)</td>
</tr>
</tbody>
</table>
**TABLE 15.** What specific laws or regulations govern or constrain your research in the field?: Frequency Distribution and Percentages (of Respondents), Question #7. *

<table>
<thead>
<tr>
<th>Laws/Permits</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Endangered Species Act</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>2) None known/given</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>3) Federal Laws/Permits</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>4) State Laws/Permits</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>5) Animal Welfare Act</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>6) University Review Boards</td>
<td>8</td>
<td>08</td>
</tr>
</tbody>
</table>

* Multiple Responses

**TABLE 16.** Use of Drugs on Wildlife by Researchers: Frequency Distribution and Percentages (of Respondents), Question #8.

<table>
<thead>
<tr>
<th>Use of Drugs</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs employed on research animals</td>
<td>61</td>
<td>61.5</td>
</tr>
<tr>
<td>Drugs not employed on research animals</td>
<td>38</td>
<td>38.5</td>
</tr>
</tbody>
</table>

Sources of Information on Side Effects of Drugs/Techniques:

<table>
<thead>
<tr>
<th>Source of Information</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Journals/Literature</td>
<td>31</td>
<td>39.0</td>
</tr>
<tr>
<td>Veterinarians</td>
<td>29</td>
<td>36.0</td>
</tr>
<tr>
<td>Suppliers' Instructions</td>
<td>10</td>
<td>12.5</td>
</tr>
<tr>
<td>Other Biologists</td>
<td>10</td>
<td>12.5</td>
</tr>
</tbody>
</table>

**TABLE 17.** Would you advise against the use of any particular drug or technology?: Question #9, Frequencies and Percentages (of respondents).

<table>
<thead>
<tr>
<th>Advice</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>No Response</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>7</td>
<td>07</td>
</tr>
<tr>
<td>Depends on Situation</td>
<td>5</td>
<td>05</td>
</tr>
</tbody>
</table>

Drugs Advised Against w/Reasons: Frequencies (Percentages)

<table>
<thead>
<tr>
<th>Drugs advised against</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Succinylcholine chloride (Succostrin)</td>
<td>8</td>
<td>08</td>
</tr>
<tr>
<td>--High mortality rates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--Unethical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Drugs that are too dangerous for humans</td>
<td>6</td>
<td>06</td>
</tr>
<tr>
<td>--M-99, Morphine Derivatives/respiratory arrest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--Not to be used &lt;30 days before harvesting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Drugs with narrow tolerance</td>
<td>4</td>
<td>04</td>
</tr>
<tr>
<td>--High risk of injury/death</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Sernylan</td>
<td>2</td>
<td>02</td>
</tr>
<tr>
<td>--Negative public opinion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--Not enough margin of error</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) Any painful drugs</td>
<td>2</td>
<td>02</td>
</tr>
</tbody>
</table>
TABLE 17 Cont.
Other Concerns (01 Frequency Each):

- Nicotine sulfate/Low tolerance/death
- Drugs w/long recovery periods
- Use of drugs in excited deer
- Net gunning for elk/too brutal on the animals
- Rocket nets on deer/major trauma
- Unnecessary use of killing traps without strong scientific rationale
- Snares: injury, suffering, and too many unintended victims
- External transmitters on cavity nesting species
- Surgical operations on free-ranging animals
- Banding of bats in hibernation
- Any techniques that are inhumane and only serve to inflame anti-hunting animal rightists
- Any drug or technology that imposes stress in pursuit of trivial goals

TABLE 18. Do you believe your research on wild animals in any way changes their behavior? If yes, how?: Question # 10, Frequency Distribution and Percentages (in parentheses).

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>63 (63)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>28 (28)</td>
<td></td>
</tr>
<tr>
<td>Maybe</td>
<td>4 (04)</td>
<td></td>
</tr>
<tr>
<td>No Response</td>
<td>3 (03)</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>1 (01)</td>
<td></td>
</tr>
</tbody>
</table>

How animal behavior is changed: Frequencies (and Percentages)

13 (13) 1) Increased wariness/aversion to humans
9 (09) 2) Temporary only
5 (05) 3) Generally minimal
4 (04) 4) Aerial surveying alters response behavior
4 (04) 5) Increased wariness around live traps
3 (03) 6) Radiotelemetry on birds may affect survival
2 (02) 7) Radio-transmitters often affect behavior
2 (02) 8) Research always affects behavior

Other Concerns (01 Frequency Each):

- Alters inter- and intra-specific social interactions
- Captivity changes behavior of all genetically wild animals
- Increases stress, regardless of precautions taken
- Radio-collars cause prey to be more visible to predators
- Annoyance from radio-collars
- Nasal markers on ducks/capture may alter survival rates
- Tagging influences mobility and possibly habitat choice
- Color marking systems affect reproduction in mourning doves
**TABLE 19.** Benefits from Wildlife Research: Frequency Distribution and Percentages (of Respondents), Question #11.

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species</td>
<td>45</td>
<td>(43)</td>
</tr>
<tr>
<td>Ecosystem</td>
<td>14</td>
<td>(14)</td>
</tr>
<tr>
<td>Managers</td>
<td>13</td>
<td>(13)</td>
</tr>
<tr>
<td>No Response</td>
<td>8</td>
<td>(08)</td>
</tr>
<tr>
<td>Public</td>
<td>7</td>
<td>(07)</td>
</tr>
<tr>
<td>Individual Animals</td>
<td>5</td>
<td>(05)</td>
</tr>
<tr>
<td>Researchers</td>
<td>4</td>
<td>(04)</td>
</tr>
<tr>
<td>Sportsmen</td>
<td>3</td>
<td>(03)</td>
</tr>
</tbody>
</table>

Which benefits least from your research: *

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Animals</td>
<td>43</td>
<td>(43)</td>
</tr>
<tr>
<td>Companies</td>
<td>36</td>
<td>(36)</td>
</tr>
<tr>
<td>Sportsmen</td>
<td>23</td>
<td>(23)</td>
</tr>
<tr>
<td>Ecosystem</td>
<td>13</td>
<td>(13)</td>
</tr>
<tr>
<td>Researchers</td>
<td>12</td>
<td>(12)</td>
</tr>
<tr>
<td>No Response</td>
<td>12</td>
<td>(12)</td>
</tr>
</tbody>
</table>

* Multiple Responses

**TABLE 20.** Regulation and Accountability in Wildlife Research: Frequency Distribution and Percentages (of Respondents), Question #12.

<table>
<thead>
<tr>
<th>Regulation and Accountability</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildlife research is too closely regulated.</td>
<td>6</td>
<td>(06)</td>
</tr>
<tr>
<td>Wildlife research needs more regulation and accountability.</td>
<td>14</td>
<td>(14)</td>
</tr>
<tr>
<td>Regulation and accountability are adequate.</td>
<td>74</td>
<td>(74)</td>
</tr>
<tr>
<td>No Response</td>
<td>5</td>
<td>(05)</td>
</tr>
</tbody>
</table>

**TABLE 21.** Awareness of a Written Code of Ethics for the Wildlife Profession: Frequency Distribution and Percentages (of Respondents), Question #13.

<table>
<thead>
<tr>
<th>Awareness of Written Code of Ethics</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aware of a written code of ethics</td>
<td>50</td>
<td>(50)</td>
</tr>
<tr>
<td>Not aware of a written code of ethics</td>
<td>42</td>
<td>(42)</td>
</tr>
<tr>
<td>No Response</td>
<td>7</td>
<td>(07)</td>
</tr>
<tr>
<td>I follow this written code</td>
<td>45</td>
<td>(90)</td>
</tr>
<tr>
<td>I do not follow this written code</td>
<td>3</td>
<td>(06)</td>
</tr>
<tr>
<td>I mostly follow this written code</td>
<td>2</td>
<td>(04)</td>
</tr>
</tbody>
</table>
Table 21 Cont.
Codes of Ethics cited: *

<table>
<thead>
<tr>
<th>Code of Ethics</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildlife Society Code of Ethics</td>
<td>38 (76)</td>
</tr>
<tr>
<td>American Society of Mammalogists/</td>
<td>8 (16)</td>
</tr>
<tr>
<td>Acceptable Field Methods in Mammalogy</td>
<td></td>
</tr>
<tr>
<td>Personal code of ethics</td>
<td>4 (08)</td>
</tr>
<tr>
<td>American Ornithologists Union</td>
<td>2 (04)</td>
</tr>
<tr>
<td>Aldo Leopold's philosophy</td>
<td>2 (04)</td>
</tr>
<tr>
<td>Could not name code followed</td>
<td>2 (04)</td>
</tr>
<tr>
<td>Other</td>
<td>7 (14)</td>
</tr>
</tbody>
</table>

* More than one response possible
ETHICS IN WILDLIFE RESEARCH QUESTIONNAIRE

October, 1989

Dear Colleague:

I invite you to participate with other wildlife biologists in an international survey involving questions of ethics in research. The questions are designed to discover current codes of conduct among wildlife researchers as well as attitudes toward their study subjects and perceptions about animals in general.

All participants share in common either 1) publication in the 1985-88 Wildlife Society Bulletin or 2) active research in Montana. This questionnaire offers you the opportunity to air your views about the present state of wildlife research, its ethical challenges, and its future directions. I believe you will find the questions both interesting and thought provoking.

Your honest and straightforward answers are appreciated; there are no right or wrong answers. All responses are confidential, as no names will be attached to any answers. A code number appears at the end of the survey in the event further correspondence becomes necessary. Data and opinions from the questionnaires will be analyzed and presented in a professional paper. I also plan to publish a discussion of the results and recommendations in an appropriate wildlife publication as well as philosophical journals.

Your response within seven days will be greatly appreciated. A stamped, addressed envelope is enclosed for your convenience. A brief summary of your colleagues' opinions will be mailed to all interested participants. Thank you for your cooperation; your opinions are a valuable contribution to this research.

M.J. Kahn
Dept. of Environmental Studies
University of Montana
1. What key research techniques do you employ in the field? (check all that apply)
   - [ ] Direct Observation
   - [ ] Satellite Tracking
   - [ ] Banding
   - [ ] Marking/Tattooing
   - [ ] Extraction
   - [ ] Trapping
   - [ ] Radio-collaring
   - [ ] Surgical Techniques
   - [ ] Darting/Drugging
   - [ ] Other

2. On what species or species groups do you generally do research and what do you consider the greatest threat to the continued health and viability of those species?

3. How could your research contribute to the continued health and viability of those species?

4. How would you characterize your research? (check one item only per group)

   A. 1) [ ] Highly important to species viability
       2) [ ] Important
       3) [ ] Beneficial

   B. 1) [ ] Of direct benefit to the individual animal
       2) [ ] Of direct benefit to the species
       3) [ ] Beneficial mainly to humans

   C. 1) [ ] Highly intrusive to the animal
       2) [ ] Less intrusive
       3) [ ] Not intrusive
5. Please list up to 5 specific ways in which animals have benefited from your research.

1)  

2)  

3)  

4)  

5)  

6. As a wildlife biologist, to whom or what is your primary obligation? (check one only)

___ to the public       ___ to my agency  
___ to the animals involved ___ to the ecosystem/ natural processes  
___ to the species ___ other (specify)  
___ to my profession ________________  

7. What specific laws or regulations at present govern or constrain your research in the field?

8. Do you employ any drugs on your research animals? ______
   If yes, where do you look for readily accessible information on detrimental side effects of drugs or techniques?
9. Would you advise against the use of any particular drug or technology for wildlife research? _____
   If yes, please specify and indicate why:

10. Do you believe your research on wild animals in any way changes their behavior? ____ Yes ____ No
    If yes, how?

11. Which of the following benefit from your research on wildlife? (check all that apply)
    ____ Individual animals
    ____ Species
    ____ The public
    ____ Sportsmen
    ____ Companies producing research materials
    ____ Researchers
    ____ Wildlife managers
    ____ The ecosystem ("higher processes," etc.)
    ____ Other (specify)

Which benefits most? ___________________________

Which benefits least? _________________________

12. Which statement most accurately describes your opinion of the present state of regulation and accountability in wildlife research? (check one only)
    ____ Wildlife research is too closely regulated.
    ____ Wildlife research needs more regulation and accountability.
    ____ Regulation and accountability are adequate.

13. Are you aware of a written code of ethics for wildlife biologists? _____ Do you follow such a code? _____
    If yes, please cite name of code:
14. Please describe your personal ethic regarding animal research.
15. PLEASE CHECK ONE BOX ONLY FOR EACH OF THE FOLLOWING STATEMENTS.

<table>
<thead>
<tr>
<th>STRONGLY AGREE</th>
<th>AGREE</th>
<th>NO OPINION</th>
<th>DISAGREE</th>
<th>STRONGLY DISAGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

a) Research experiments on wild animals are rarely necessary.
( ) ( ) ( ) ( ) ( )

b) There is no need for a stronger professional code of ethics for the wildlife profession.
( ) ( ) ( ) ( ) ( )

c) Graduate students are well grounded in the ethical treatment of animals.
( ) ( ) ( ) ( ) ( )

d) An animal that is drugged, radio-collared, and continuously monitored is still wild.
( ) ( ) ( ) ( ) ( )

e) Animals have sentience.
( ) ( ) ( ) ( ) ( )

f) Mammals are more deserving of ethical treatment than amphibians.
( ) ( ) ( ) ( ) ( )

g) Animals have consciousness.
( ) ( ) ( ) ( ) ( )

h) Political pressures influence my research.
( ) ( ) ( ) ( ) ( )

i) There is a need for an improved international network of communication to prevent unnecessary research on wildlife.
( ) ( ) ( ) ( ) ( )
16. Aside from your professional stance, what does an animal mean to you personally, in an intellectual, emotional, cultural, or spiritual sense?
17. What is your gender? ___ Male ___ Female

18. Your age is: ___ 20 or under ___ 41-50
    ___ 21-30 ___ 51-60
    ___ 31-40 ___ over 60

19. Highest level of education completed:
    ___ Diploma ___ PhD/EdD
    ___ BA/BS ___ Specialist
    ___ MA/MS/MEd ___ Other

20. Current position or title: __________________________

21. Your ethnic group is:
    ___ American Indian ___ Asian
    ___ White/Caucasian ___ Hispanic
    ___ Black ___ Other

22. How many years have you been involved in wildlife research?
    ___ under 2 years ___ 11-15 years
    ___ 2-5 years ___ 16-20 years
    ___ 6-10 years ___ over 20 years

THANK YOU VERY MUCH FOR YOUR TIME AND INTEREST.

*** PLEASE MAIL YOUR QUESTIONNAIRE TODAY IN THE RETURN ENVELOPE. ***

I would like a summary of results sent to me. _____
Name and address: (You may detach and send separately if preferred.)
NOTES

1. Personal letter, received January, 1989, in response to my inquiry about a proposal for a workshop on the impact of biologists on bears. The names of all scientists surveyed for this paper are confidential.


5. Ibid.

6. Aristotle, "Moral virtue as the result of habits," Book II of the Nicomachean Ethics, pp. 34-35.


8. Ibid., p. 115.


10. Ibid., p. 117.


12. Ibid. p. 224.


15. Immanuel Kant, Lectures on Ethics, pp. 239-240.

16. Nor Hall, The Moon and the Virgin; Reflections on the Archetypal Feminine, speaks of this betrayal: "By repressing
the feminine one encourages a violent emergence. Freud must have known this when he called the feminine (which is the unconscious) "enemy to civilization"... because the feminine does not live according to the rules of worldly authority." The feminine principle (Ishtar) asks that "men be aware of the axial moments in their own creativity: conception, incubation, and pains of labor, that these feminine mysteries be felt as deeply as the confidence that the phenomenal world can be understood and managed," pp. 15-17.

17. Carol Gilligan, In A Different Voice.


19. Ibid., p. 364.


22. Ibid.

23. Nor Hall says of such artists as Nancy Erickson: "The woman who can bend enough to go from reflecting to fabricating will be the one who can make up for something that is missing in the world," p. 230.


25. Ibid., p. 8.

26. Ibid., p. 44.

27. Mary Midgley, Animals and Why They Matter, p. 35.

28. Ibid.

29. Nor Hall, p. 68.


32. Mary Midgley, p. 43.

34. Ibid., p. 122.
35. Ibid., p. 120.
37. Decker and Brown, p. 600.
38. Richard Hutto, et al., p. 3.
40. Alston Chase, "The Prisoner of Hudson Bay," p. 147. Information on the Churchill polar bear situation for this chapter has been condensed from Chase's article as well as from interviews with bear expert Dr. Charles Jonkel.
41. Ibid., p. 148.
42. Personal interview, 1989.
43. Ibid.
47. Ibid., p. 148.
51. Conner, p. 434.
52. Norman Smith of the University of Arizona, quoted by Ted Williams in *Audubon*, p. 34.
56. Malcolm Hunter of the University of Maine, quoted by Williams, p. 34.
57. Personal interview with a former wildlife researcher.

58. Excerpt from a letter written to the American Society of Mammalogists by the above scientist, December 1989.


60. Ibid.


63. Thomas Kuhn, The Structure of Scientific Revolutions, p. 5.

64. Ibid., p. 152.


Schweitzer, Albert. *The Teaching of Reverence for Life*. 136


