Barred Owls in the Pacific Northwest: An Ethics Brief

Image: Barred owl photograph from Wikimedia Commons, www.wikimedia.org

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Introduction

The Barred Owl Stakeholder Group was formed by the United States Fish and Wildlife Service (USFWS) in 2009. Its purpose was to help with the scoping of an environmental impact statement (EIS) on an experiment to remove barred owls from northern spotted owl habitats in the Pacific Northwest. The removal of these owls poses ethical and scientific issues alike, and the USFWS sought to understand the ethical issues by establishing this stakeholder group.[1] The stakeholder group explored two primary ethical questions about barred owl removal. The first was whether the removal was ethically justified, and the second whether removal could be accomplished humanely. This ethics brief relates the process and substance of these discussions and is the final report by the ethics consultant (myself) to the Barred Owl Working Group.

A *brief* is a succinct document used in many professions to set forth the facts and ideas relevant to a particular case. The term itself derives from the Latin *brevis* meaning "short". Briefs may describe and/or explain a particular circumstance, outline the reasons for a decision or course of action, and/or justify a particular point of view in professional practice and public policy.

Legal briefs in the United States are a good example of this kind of document. Briefs of many sorts are presented to courts to argue for or against matters of fact and conclusions of law. This is to say that briefs are interpretations of what the facts are, what the law says, and how the facts and law are related. One of the more common examples is the amicus brief. Literally translated as "friend of the court" (Latin *amicus curiae*), these briefs are filed with courts by individuals or groups who, while not a direct party to a case, have an interest in the outcome. Commonly used in environmental law, amicus briefs seek to persuade the court of the merits of one or another legal interpretation.

An ethics brief serves similar purposes. It is a succinct document that describes, explains and justifies one or more ethical interpretations regarding a concrete issue or set of issues. The issue(s) under scrutiny, along with their enfolding context, is what we term a *case*. In the arena of environmental affairs, such interpretations always have relevance to matters of policy and practice. Whether implicit or explicit, ethical concepts and criteria are used to both justify and critique policy decisions and actions, which

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[1] This was consistent with two of the main purposes of the National Environmental Policy Act (NEPA) of 1969 -- improving decision-making in environmental policy, and facilitating broad public participation in those decisions. See the National Environmental Policy Act of 1969, as amended, 42 U.S.C. §§ 4321-4347, available at www.nepa.gov.

themselves have ethical consequences for the well-being of others, human and non-human.

This brief discusses ethical issues arising out of a case where one species may be removed for the benefit of another.[2] The species in question is the barred owl (*Strix varia*), whose immigration or "range expansion" into the habitat of the northern spotted owl (*Strix occidentalis caurina*) is considered a threat to the spotted owl's survival in the wild. Deciding whether and how to remove barred owls raises complex moral questions about the well-being of barred owls at both the individual and community levels.

In what follows, I briefly outline the empirical and policy context of the case, discuss the methods we used in the Barred Owl Stakeholder Group, outline the ethical dimensions of environmental policy and wildlife management, summarize the findings of the stakeholder group, suggest several future considerations, and share an ethical toolbox of background ideas indispensable to moral reasoning about wildlife and environmental policy.

The creation of this ethics brief would not have been possible without the wisdom, knowledge and help of Robin Bown, Paul Phifer, Jim Thraikill, and their colleagues at the USFWS. They provided invaluable information, insight, leadership, and logistic support. So too, the members of the Barred Owl Stakeholder Group, whose good nature, dialogic sensibility, and depth of experience, made invaluable contributions to the success of this process.

Despite all this help, and no matter how well reasoned or evidenced, an ethics brief remain an act of interpretation. Think of them as a meta-analysis tasked with teasing out the meaning and significance of a particular case. The use of differing theories or new empirical information will alter one's interpretation. This is as equally true in an ethics brief, as it is in any other kind of brief -- legal, political or scientific.

I make no pretense, then, that this brief constitutes a final, certain and unquestionable interpretation of the ethics of barred owl management. It is, rather, a point of departure for individual reflection and policy discussions on the ethical question arising from barred owls in the Pacific Northwest. My hope is that it will help citizens, scientists, policy-makers and others think through and act upon our ethical responsibilities for the well-being of people, animals and nature.

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[2] While both lethal and non-lethal removal is being considered, the lethal options have generated the most concern amongst interested parties.

The Case: Empirical Context and Policy Issues

The context for this brief is the attempt to save the northern spotted owl from becoming extinct in the wild.

Northern spotted owls are one of three sub-species in North America, the other two being the California spotted owl (*Strix occidentalis occidentalis*) and the Mexican spotted owl (*Strix occidentalis lucida*). It is a medium sized owl, and the largest of the three subspecies. A nocturnal predator of small mammals like flying squirrels, wood rats and voles, it prefers old-growth and similar structurally-diverse forest habitats of the Pacific Northwest, primarily along the Coastal and Cascade Mountain Ranges. Its natural range runs south from southwestern British Columbia, through the states of Washington and Oregon, and into northwestern California. Generally monogamous, the biotic potential of spotted owls is low. Although adults have a high survival rate and a relatively long life-span in which to breed, they also have low fecundity -- that is, a low birth and/or survival rate for juvenile birds. This low fecundity, in conjunction with its geographic location in areas of extensive forestry, has contributed to a rapid decline in its population over the last forty years. There is substantial uncertainty whether the population in Canada and the United States can persist in the wild (NatureServe Explorer; U.S. Fish and Wildlife Service, 2008, 43-48.).

Hotly contested debates over forestry characterized the political and policy environment of the Pacific Northwest in the 1980s and 1990s. This involved a paradigm shift towards ecosystem management and sustainable forestry, a change in management goals from sustained yield to ecosystem health, and the rising economic and social importance of non-commodity forest values. The northern spotted owl became a contested symbol in this debate. For some, these owls were variously associated with preserving old growth forests, maintaining essential habitat for endangered species, protecting biodiversity, and transitioning to sustainable forestry practices. For others, the owl was emblematic for other reasons. They saw the owl as a Trojan horse for locking up timber resources, an excuse to grab land for recreational wilderness, an intrusion of government bureaucracy into the affairs of local communities, an economic threat to local livelihoods, and a menace to the profitability of the timber industry.

This conflict was also a debate over ethics, with various sides arguing for a set of moral values that they believed trumped those of their adversaries. For some, the intrinsic value of northern spotted owls and old growth forests were the dominant reasons. For others, people and their economic prosperity were the focus of moral concern. Still others combined elements of both these positions. Using ideas drawn from animal and environmental ethics, religion, spirituality, and politics (to name a few), these policy communities argued over the intrinsic and instrumental value of owls and forests.

Indeed, this moral conflict loomed large in the policy presuppositions of both the deep ecology and wise use movements that emerged at this time (Devall and Sessions, 1985; Booth, 1993; McLaughlin, 1993; Yaffee, 1994; Proctor, 1998; Layzer, 2006, 191-222.).

It was in this context that the northern spotted owl was listed as a threatened species under the federal Endangered Species Act on 26 June 1990. The USFWS subsequently released a "Final Recovery Plan for the Northern Spotted Owl" on 13 May 2008, and then a "Revised Recovery Plan for the Northern Spotted Owl" on 28 June 2011 (U.S. Fish and Wildlife Service, 2008; U.S. Fish and Wildlife Service, 2011). At the time of its listing, the threats to the northern spotted owl's survival were originally attributed to habitat loss from timber harvesting, exacerbated by catastrophic fires, volcanic eruptions, and wind storms as described in the listing. By the time the Final Recovery Plan was released, inter-specific competition with the expanding barred owl was a pressing concern. This concern only increased with the release of the Revised Recovery Plan. Currently there are additional potential concerns having to do with emerging infectious disease (e.g., West Nile virus), though no significant effects are documented at this time. The uncertain impact of global climate change throws a wild card into the mix. The incursion of barred owls into the northern spotted owl's range, however, is the most immediate concern alongside past and current habitat loss (U.S. Fish and Wildlife Service, 2008, 57-67; U.S. Fish and Wildlife Service, 2011, I: 1-10, III: 5-11.).

Image: Spotted owl distribution map provided by Birds of North America Online and the Cornell Lab of Ornithology: http://bna.birds.cornell.edu.

The barred owl (*Strix varia*) includes four sub-species in North America. Historically barred owls ranged from the north woods perhaps as far north as southeastern Canada, through the the eastern and central United States into Mexico. Since the early 1900s, northern barred owls (*Strix varia varia*) have been expanding their range northward and westward through the forests and grasslands of the boreal forests and northern prairies. Barred owls are now resident along the western seaboard, from Alaska down into California. The barred owl is larger and more aggressive than the spotted owl. It also has a broader diet and wider preference of habitat types. Barred owls will eat both the small mammals that spotted owls prefer, as well as a range of other prey (e.g., crayfish,

small birds, mollusks, amphibians), and they can be found inhabiting both old-growth and moderate-age forest types (NatureServe Explorer; Gutierrez et al., 2007; U.S. Fish and Wildlife Service, 2008, 8, 64-66; Livezey, 2009).

It appears that barred owls are displacing northern spotted owls through interspecific (inter-species) competition for food resources, nesting sites, and preferred habitats, further exacerbating the threats from forestry and other causes. With the threat posed by barred owls in mind, the Revised Northern Spotted Owl Recovery Plan identifies management actions needed for the conservation of the northern spotted owl. One recommended action is the experimental removal of barred owls from northern spotted owl habitats. The USFWS wishes to conduct these experiments to determine if removing barred owls may help maintain northern spotted owls in the wild. The results of these experiments will then be used to consider future policies and management practices to promote northern spotted owl survival (U.S. Fish and Wildlife Service, 2008, 29-35; U.S. Fish and Wildlife Service, 2011, III: 62-III: 67.).

Undertaking these experiments requires compliance with NEPA, in this case through the development of an EIS. As part of this assessment, the USFWS had the foresight to acknowledge that removal of barred owls from the wild raised significant ethical questions and concerns. In an effort to grapple with these in a forthright manner, the USFWS held a preliminary meeting on 14 November 2009 at the Oregon Fish and Wildlife Office in Portland, OR. Shortly thereafter, the Barred Owl Stakeholders Group was formed under the umbrella of the Barred Owl Work Group, itself an instrument of the Recovery Plan. The Barred Owl Stakeholders Group was composed of over forty invited representatives from relevant government agencies, the forest product industry, Native American tribes, wildlife rehabilitators, environmental organizations, and animal protection groups. The Barred Owl Stakeholders Group operated as part of a *scoping process*, that is, to help the USFWS establish its scope of analysis for the EIS. It was not formed to formally advise or seek consensus on a proposed policy or management action by the USFWS. To help the Barred Owl Stakeholders Group explore the ethical dimensions of barred owl removal experiments (and by extension, barred owl management), the USFWS contracted with an ethicist, William Lynn (myself), with expertise in the area of ethics, environmental policy, and wildlife management.

Methodology

Discussions of ethics tend to fail when the participants lack a basic understanding and common language for discussing ethics, and the content is too abstract as to be applied to concrete cases. In consultation and collaboration with the USFWS team responsible for the northern spotted ow recovery effort, a mixed methods approach was designed to explore the ethical questions surrounding barred owl management in northern spotted owl habitat. Our goal was not the creation of a determinative or predictive method that would provide "the answer" to the ethics of owl management. Rather, we sought after two more reasonable goals. The first was to help the Barred Owl Stakeholder Group and USFWS identify and clarify the moral values and issues that are woven into this case. The second was to provide conceptual tools for ethical guidance in the development of relevant environmental policies and wildlife management practices.

Image: Barred owl distribution map provided by Birds of North America Online and the Cornell Lab of Ornithology: http://bna.birds.cornell.edu.

In this instance, the methods chosen pivoted on the creation of a learning community and a policy dialogue. To achieve both goals, we combined ethics training, presentations, field trips, focus groups, and facilitated group discussion. This suite of methods sought to triangulate on the meaning and significance that barred owl management has for individual and collective stakeholders from the public, private and non-profit sectors.

Learning Communities

A *learning community* is a group of individuals who participate in a collaborative and proactive partnership to help each other learn. Learning communities are especially useful in the exploration of environmental issues, typically involving a variety of biological and physical phenomena, as well as a wide range of cultural, economic, ethical, social, and political features. Learning communities provide a process that is both interdisciplinary in its knowledge and responsive to a variety of stakeholders (Smith, 1993, 79 , 32-39.). As a consequence, they are well suited to the interdisciplinary knowledge and dialogue of environmental concerns.

The power of learning communities comes from their ability to transcend the limitations of strictly lecture-based education by allowing the experiences and knowledge of group

members to form part of the learning process. Learning is thus not a one way affair, as from professor to student, but a multidirectional process whereby the insights of the group are encouraged and welcomed. This does not mean that learning communities eschew expertise or lectures per se. Rather they embed those experiences in the dialogue of the group as a whole, empowering members of the learning community to make proactive contributions of their own (Wenger, 1998). Wikipedia is one example of an learning community (www.wikipedia.org). Other examples include the educational and policy ventures of the Platform of European Social NGOs (www.socialplatform.org), and the European Animal Welfare Platform (www.animalwelfareplatform.eu).

Policy Dialogues

A *policy dialogue* is one of a suite of policy making innovations that arose in response to the perceived failures of technical administration. To understand what this means a bit of background is helpful.

In order to root out widespread political corruption in the United States, the progressive movement of the late nineteenth and early twentieth centuries sought to create politically neutral government agencies to implement legislative intent, executive decisions, and judicial rulings. As they stand today, these agencies use regulation, rule-making, inspections, oversight, permits and other administrative procedures to achieve the public good. The conservation of natural resources (e.g., watersheds, forests, soils, wildlife) saw some of the earliest efforts in this respect, with the United States Forest Service, USFWS, Bureau of Land Management, and National Marine Fisheries Service arising to fulfill specific regulatory needs (Meine, 2004, 12-41.).

Only the most libertarian of critics would deny the necessity and benefits of agency regulation, including that of wildlife and the environment. Yet technical approaches to public policy do suffer several drawbacks. They tend to be administered by scientific and technical elites who hold the public at arm's length, assume a unitary public interest in the face of many competing priorities, are often inflexible and unresponsive to changing circumstances and social norms, and sometimes fail to secure legitimacy for their decisions. Because of all this, agency regulation faces increasing levels of opposition and resistance (Dryzek, 2005b, 75-98.).

This does not mean that agency regulation has failed, or that its role as a bulwark against political and corporate corruption is any less important than it was during the heyday of progressivism. Rather, it means there is a substantial desire to improve agency regulation by addressing its deficits. Democratically oriented policy making innovations such as public consultation, alternative dispute resolution, lay citizen

deliberation, public inquiries, right-to-know legislation, public-private partnerships, and the like are efforts to overcome the drawbacks of technical approaches by injecting a dose of democratic deliberation into the administrative process. The public consultations mandated by NEPA are case in point (Dryzek, 2005b, 99-120.).

Policy dialogues are one of these democratic innovations. Most of the aforementioned innovations focus on case-specific or site-specific issues, or on establishing legal standing for the public to monitor and intervene in the policy making process. Policy dialogues are different in that they focus on the values and principles that go into making concrete policy decisions. While such values and principles are inextricable to policy-making, they are rendered invisible through a focus on technical and procedural details. This allows policy elites and powerful interest groups to shape policy according to their own values, while at the same time maintaining that the policy process is value neutral and fair to all concerned. This is patently false, and policy dialogue helps make manifest the latent values and principles that lay at the foundation of policy making (see Fischer, 1993; Lakoff, 1995; Lakoff, 2004; Rich, 2005).

The goals of a policy dialogue may include enhanced knowledge, mutual learning, the networking of political adversaries, and an evolving understanding of a common policy problem. While a discreet policy consensus is not the goal of a policy dialogue, finding common ground from which to create better policies is. There are no short-cuts to accomplishing this goal, and the investment of time, resources and personnel is high. The investment is justified, however, by the prospect of a deeper and better understanding that can generate win-win resolutions to the most pressing policy issue of the day (Dryzek, 2005a).

Creating the Barred Owl Stakeholder Group

To become an effective learning community and engage in a robust policy dialogue, the Barred Owl Stakeholder Group needed to be a free space for convening and catalyzing dialogue. In particular, we wished to avoid arguing over the prior position statements of our stakeholder's home organizations. Instead, we sought to use the Barred Owl Stakeholder Group's own wealth of knowledge as a point of departure in a searching conversation. Our desire was to allow participants to think out load without worrying whether his or her view conformed to an institutional policy or the worldview of their immediate peer group.

Creating a free space requires mutual respect and trust, especially amongst individuals and groups that at other times may be political adversaries. To foster this trust, we instituted an informal *safe harbour agreement*. We agreed to forego audio or video recordings of the process, to summarize points of view and positions without

attribution to individual members, and to exercise good judgment in characterizing each other's positions to parties outside the Barred Owl Stakeholder Group. There was no gag order, and members were free to discuss the work of the group as they saw fit. Even so, we established a normative environment that successfully discouraged attempts to embarrass individuals, and promoted the consideration of views at odds with those held by the participants when they first joined in the process.

Establishing the learning community took several steps. The first of these was a series of planning conference calls in January and February of 2009. These involved key members of the Barred Owl Work Group and myself. In these calls we laid plans for a series of presentations, workshops, facilitated dialogues, focus groups, and field trips for the Barred Owl Stakeholder Group.

We followed these conference calls with a webinar led by Paul Phifer (Northern Spotted Owl Recovery Coordinator, USFWS) and Jim Thraikill (Lead Biologist of the Barred Owl Work Group, USFWS) on 25 March 2009. Representatives from the federal, state and tribal agencies, the forestry industry, as well as animal and environmental protection groups were present as members of the Barred Owl Stakeholder Group.

Phifer summarized northern spotted owl recovery efforts, outlined the roles and responsibilities of the Barred Owl Stakeholder Group as part of a scoping process, and discussed the logistics of the upcoming April workshops (see below). Thrailkill summarized the research on barred owl interactions with northern spotted owls, updated the group on the status of the northern spotted owl as a threatened species, and answered questions from participants. The volume of factual information here was large, and a traditional pedagogy of presentation followed by questions and answers was judged the most efficient manner of sharing the latest information.

Shortly after the webinar, we held an ethics and policy training workshop on 02 April 2009. Chaired by Phifer and Thrailkill, and attended by approximately 40 stakeholders, the workshop was held at the USFWS's Pacific Regional Office in Portland, Oregon. Our overall goal was to discuss the NEPA process and the role of the Barred Owl Stakeholder Group regarding experimental barred owl removal, as well as related questions of ethics in environmental policy and wildlife management.

Readings on ethics, animals and the environment by David Lavigne, Aldo Leopold and myself had been distributed ahead of time to help provide an intellectual context. We discussed the meaning of ethics, and its relevance to matters of environmental science and policy. We also explored the major paradigms of moral value (i.e., anthropocentrism, biocentrism, ecocentrism, geocentrism), and how these paradigms

help us understand why and how people care about the fate of owls and their habitat (Leopold, 1968; Lynn, 2005; Lavigne and Menon, 2006; Lynn, 2006; Lynn, 2007).

Several sessions within the workshop provided opportunities for participants to explore how ethics informed the social and ecological objectives of environmental policy and wildlife management, as well as how to identify ethical presuppositions about animals and the environment through statements drawn from literature, research articles, public hearings, and so on. The workshop ended with a facilitated, round-table discussion where individuals, reflecting on what they had learned throughout the day, sought to identify, clarify and evaluate the ethical dimensions of barred owl management. Towards the end of the meeting, the protocol for lethal removal of barred owls came under intensely scrutiny as a critical yet unclear element of the management options. All parties agreed that clarifying the protocol was essential. Altogether, this workshop established a shared language for ethical discussion, and improved communication among specialists of various fields.

In May 2009, we held a series of three conference calls. Participants in the calls were assigned to one of three focus groups -- federal, state and tribal agencies; the forest products industry; and non-governmental organizations representing animal and environmental protection. The focus groups were created to encourage the honest and comprehensive expression of interest-based concerns. Focus questions were sent to each member of the group before the conference call took place. The questions were developed out of the most significant ethics and policy issues that arose during the webinar and workshop. Once the calls began, these questions served as a starting point for a facilitated, semi-structured conversation.

The final leg of our process was a field trip and summit meeting on 17 and 18 July 2009, respectively. On the 17th, the Barred Owl Stakeholder Group traveled to a northern spotted owl study site outside Venetia, Oregon. The group observed both northern spotted and barred owls, and discussed the logistics of both lethal and non-lethal management of barred owls in rugged, heavily forested terrain. On the 18th, the stakeholders met at the Eugene Hilton in Eugene, Oregon for its final meeting. At this meeting I shared the results of the Focus Group conference calls, and we then sought ideas from the group on how to manage barred and northern spotted owl interaction.

Ethics and Environmental Policy[3]

The Barred Owl Stakeholder Group began with the presupposition that ethics informs environmental policy. Not everyone in the group agreed with this at first, and while a majority embraced the presupposition in time, a small minority maintained the value-neutrality of environmental science as the ideal for policy making. Even so, all the stakeholders understood why others believed there was a relationship between ethics and environmental policy. This section spells out that relationship in some detail as a precursor to the findings of the group.

Ethics can be a subject that is difficult to discuss, as it raises fears of imposing a rigid or ideological view of the world. There are indeed people who use ethics to shame others, or score debating points. There are also people who justify a dogmatic approach to life with a veneer of ethics. Moreover, definitions of ethics can differ greatly. Most of these differences are rooted in attempts to explain ethics in terms of something else. For example, various thinkers have tried to reduce ethical concerns to personal preferences, emotional responses, religious beliefs, social expectations and genetic determinism. Personality, empathy, spirituality, custom, and science may all enrich our understanding of ethics at various points and times. Yet we should be careful not to let this obscure the independent meaning and importance of ethics itself (Singer, 1993).

To discover what ethics means, we can look to Socrates, a Greek philosopher whose definition of ethics lies at the core of ethical thought. Socrates saw himself as a gadfly and midwife. As a gadfly he pushed people to think harder. As a midwife he helped them develop their thoughts to a higher level of expression and rigour. For he and his followers, *ethics* is about "how we ought to live" (from Plato's *Republic*, Book 1, 352d). What this brief statement means is this: ethics is about the moral values that inform (or should inform) our life. When we engage in ethics, were are not only exploring principles about what we think is good, right, just and valuable, but we are also articulating maxims of conduct based on these ideas. Overall, ethics helps us formulate rules-of- thumb that provides guidance as we strive for what the ancient Greeks termed *eudemonia*, and what we now refer to as flourishing and well-being (Rachels and Rachels, 2009).

To help us thrive as both individuals and communities, ethical dialogue has two interrelated functions -- one of critique and the other of vision. As part of the *critique*, we examine what promotes or detracts from the well-being of ourselves and others. In so doing, we identify how our worldviews, social institutions, decisions and actions affect

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[3] This section on ethics and environmental policy draws heavily from my book chapter, "Between Science and Ethics" (Lynn, 2006).

our lives. As part of the *vision*, we consider how we might improve our individual and collective lives by proactively pressing for positive changes in states-of-affairs that are either wrong or in need of improvement. Because these functions are connected, ethics is not a static ideology of absolute right versus wrong. Instead, it is a living tradition of thought that, in light of reason and evidence, is continually revising and renewing itself .

Socrates' view of ethics stands in stark contrast to those that claim *a priori* moral truths derive from God or logic, as well as those who claim that ethics is entirely relative to one's culture or subjective moods. Debates over these claims constitute a large fight in a corner of moral philosophy, and this brief is not the place to settle them. My own view is that while there may be no absolute moral truth to call upon, we are not left to the mercy of moral relativism and the nihilistic world such relativism justifies. Instead, using reason and evidence, we can make good faith interpretations of our responsibilities in the world. Doing so allows us to adjust our moral compass to distinguish better from worse ideas and practices. In this way ethics empowers us to improve the well-being of ourselves or others (Bernstein, 1991; Midgley, 1993a; Lynn, 2004; Lynn, 2006)(Toulmin and Jonsen, 1988; Weston, 2006).[4]

Ethics is also a form of power. While not a physical power like military force, it is rather a form of *discursive power*. It binds together our ideas and actions about what we ought to do (or ought not do). It provides a powerful motivational force that explains and justifies how we treat others and the earth. In this sense it is a causal factor that needs to be understood if we have any hope of explaining why people and groups do what they do. Ethics can reveal the moral issues at the heart of a situation. Once a problem is made visible through ethical reflection, it can then guide our responses in trying to resolve that problem. It also is an indispensable means of holding people and social systems accountable. Think of what it means to call someone a liar. If the claim is accurate, and the lie has injured people, then an ethical judgment about the lie's intentions and subsequent actions has persuasive power that is difficult to deny. The discursive power of ethics is thereby indispensable in community life. It is an element of our social customs and public policies, as moral norms help justify and critique our individual and collective beliefs and behaviour. It is also the inspiration for social movements seeking animal and environmental protection, human rights and social justice, local

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[4] There is a related claim that what is customary or legal defines what is ethical. A moments thought dispels this idea. We are familiar with unjust customs, e.g., racial and ethnic prejudice. We are also familiar with unjust laws, e.g., Jim Crow laws in the United States. What is customary or legal is not necessarily ethical, and social norms and laws that were once widely accepted are rightly critiqued and changed.

autonomy and economic vitality, or any other form of public good. (Gross, 1997; Jasper, 1997; Ansbro, 2000).

Environmental policy and its relationship to ethics is as complex an animal as ethics itself. Let us start with a definition of public policy generally. Perhaps the most bare boned is "what governments say and do" (see Birkland, 2005, Chapter 1.). This is a good starting point, and serves to highlight the role of governmental policy positions, legislation, executive action, regulatory agencies, rule-making and enforcement, judicial review, and the like. It also allows us to note that governments may have unarticulated policies that are seen through its actions, as well as announced policies that lack implementation and enforcement mechanisms. With this definition in mind, we might say that environmental policy is what governments say and do about the environment.

When we consider the full range of non-governmental policy actors who also make environmental policy, however, the bare-bones definition comes up wanting. For instance, it leaves out the wider community that shapes such policies -- advocacy groups, corporations, lobbyists, educational and religious organizations, and so on. This is especially important given the ever widening range of stakeholders claiming an interest in environmental matters. It is for this reason that environmental policy has grown beyond a focus on game laws and the conservation of resources. Today it encompasses a much broader array of concerns, including animal protection, endangered species, biodiversity, public health, aesthetics, environmental justice, and national security.

The bare-boned definition also fails to emphasize the connection between environmental policy and the common good. Some environmental policies may promote the common good while others may harm it. While undoubtedly a pragmatic matter of economics and politics, this is also an ethical matter. Whether through the preparation of environmental impact statements, mitigation of global warming, or endangered species protection (to name but three examples), someone in the public somewhere will reap a benefit, while others will claim a harm. Whether those benefits and/or harms to the public can be justified is in part a moral question.

In addition, we might ask, who the "public" is? The bare-boned definition takes this for granted, but the answer is not as clear as one might think. Everyday usage elides "taxpayers" with the public, but surely that cannot be correct. Is it only citizens then? Absolutely not, as the human and civil rights of resident aliens are well established under the Unites States Constitution and the International Declaration of Human Rights. Generally, then, the public is considered to be the community at large. Yet even this is subject to interpretation. As Aldo Leopold noted, community can be interpreted

narrowly to refer only to human beings, or more broadly, as encompassing some or all of the natural world. Following Leopold, environmental policy may be responsible to both a human public and a wider community of life (Leopold, 1968).

Moreover, the bare-boned definition ignores the normative context in the formation of policy. Policy communities approach policy making with a variety of values in mind, visions of the good life, and beliefs about what is best for the common good. The norms of a political community thus shape what is considered good or bad environmental policy. These norms are found across the board, from statements of principle and policy white papers, to putatively objective and quantitative analyses, to the implementation and evaluation of regulatory action (Jennings, 1983; Rein, 1983; Caldwell and Frechette, 1992; Shrader-Frechette and McCoy, 1994; Yanow, 1999).

As an alternative, I define environmental policy as what governments, and others, say and do, that affects the well-being of the community of life. This is an attempt to acknowledge the full range of policy actors, highlight explicit and implicit policy actions, recognize the diverse meanings of community, and emphasize the ethical dimensions of environmental policy. Such a definition has a number of moral implications for barred owl management.

First, environmental policy is "ethics writ large". How human beings manage wildlife has real consequences for their well-being, the integrity of their habitats, and the livelihoods of other humans. Barred owl management will therefore be laden with moral implications.

Second, the stickiest problems in environmental policy are deeply rooted moral conflicts over whether (and how) to coexist with other forms of life. Wolves, bears, coyotes, whales, seals, and many other creatures are at the heart of heated controversies. Given the northern spotted owls' symbolic meaning, barred owl management raises similar prospects.

Third, policy decisions about wildlife management cannot rest on ecological science or economic forecasts alone. Accumulating more empirical data, developing better quantitative theories, or inventing new management techniques, will not resolve the issues before us. Removing barred owls is an ethics-laden question that requires an ethical response.

Fourth, ethics is indispensable to understanding the moral sensibilities of our policy communities. We cannot properly characterize the meaning of white papers, public comments, public testimony, policy decisions, management action, protest movements,

and so on without ethical analysis. This will be true of those policy communities concerned with the barred and northern spotted owls.

To be fair, not everyone agrees that ethics is, or should be, an element of environmental policy. There are two main sources for this, both of which were discussed individually and as a group in the stakeholder meetings.

The first source is the simple denial that moral questions are relevant to non-human nature. This is known as the position of *absolute dismissal* (Midgley, 1984, 45-52.). Advocates of this position believe that only human well-being is a moral concern. Other matters may be important in so far as they have an impact on humankind, but ethical concerns about the non-human world per se can be dismissed out of hand. Examples of this abound in both religious and political ideologies (White, 1968; Pepper, 1984). Despite that, the development of robust ethical thinking about animals and the environment has debunked this position. From an ethical perspective, claiming animals and environments are beyond the scope of morality is akin to claiming evolution is 'just' a theory or global warming is a hoax.

The second and more substantive source is the belief that science is the true foundation of a rational and evidentiary environmental policy. *Scientism*, as this position is sometimes called, believes that the natural and social sciences provide an objective outlook on the world, and the scientific method ensures the objectivity of this knowledge (Sorell, 1991). In this view, ethics is the realm of emotional and subjective responses that have no place in the formation of policy. A neutral science -- neutral with respect to social and moral values -- is thus the foundation for the development of good environmental policy. Several common discourses of environmental policy are associated with scientism, including administrative rationalism (let the experts decide) and economic rationalism (let the economists decide). While broadly subscribed to in schools of public policy, neither has proved fully adequate to the task of developing or interpreting public policies that promote individual or collective goods (Fischer, 1993; Dryzek, 1996; Fischer, 1998; Dryzek, 2005b).

How then should we think about this claim? If we consider objectivity and the scientific method as indicative of honesty in research, or the systematic practice of using reason and evidence in a progressive process of learning about the world, then there is much to praise in this position. Science can help us expose invidious bias as well as avoid errors of fact and interpretation. It is thus indispensable to our understanding of the environment and the creation of sound environmental policies.

At the same time, and without contradiction, science is never value-free, whether of moral or other values. Moral sensibilities and other values are embedded within the intentions, actions and/or consequences of science itself. One way to express this is to say that science operates in two value-laden domains, one internal and the other external to science itself. Both domains are crucial to the integrity and credibility of science and its contribution to environmental policy.

The *internal domain* refers to the methods of research and the production of scientific knowledge. Terms such as professional ethics, codes of conduct, and scientific integrity implicitly reference this domain. Ethics in the internal domain helps ensure the integrity of research, upholding two core moral values of science itself -- truth and trust. By truth I am referring to the rectitude of scientists in the collection, analysis, interpretation and communication of research. By trust, I am thinking about the inescapable role of academic freedom, honesty, transparency, collegiality and the avoidance of conflicts of interest.

The *external domain* refers to the uses of scientific knowledge, and the applications of its theories, methods and associated technologies. The reason the external domain exists is that science, for better or worse, has direct and indirect impacts on the health and well-being of people, animals and nature. These impacts have consequences at a number of distinct if interconnected scales on individuals, populations, species, and communities, in natural and social systems, and in geographic space and historical time. So we often discuss this domain in terms of animal welfare, sustainability, environmental justice, and the like.

Early recognition of both domains is embedded in professional oaths and codes of conduct. The best known example is the ancient Hippocratic Oath of human (and now veterinary medicine) to "first do no harm". Originally, these oaths were aspirational and unenforceable. After World War II, however, the Nuremberg Trials sparked a movement for mandatory ethical rules of scientific research in Europe, North America, and elsewhere (Resnik, 1998; Rollin, 2006).

A growing body of statutory and regulatory oversight of both human and animal research is the result. This takes the form of human and animal subject review committees in medicine, as well as the biological and social sciences. In the United States, these are known as Institutional Review Boards and Institutional Animal Use and Care Committees, respectively (Kimmel, 1988; Gluck et al., 2002)(Monamy, 2000) (National Academy of Sciences et al., 1992; Orlans, 1993; Rollin, 1999).

Because of this movement, ethics is now part of the institutional framework of much policy-making. In the medical and health sciences, the signature example is the Ethical, Legal and Social Implications Research Program (ELSI) of the National Human Genome Research Institute (NHGRI). In the physical, social and engineering sciences, it is two National Science Foundation (NSF) programs -- Ethics and Values Studies (EVS) and Ethics Education in Science and Engineering (EESE). ELSI was formed by NHGRI to explore ethical, social and legal question about sequencing the human genome. The NSF established the EVS and EESE to develop and disseminate ethical knowledge about the conduct and impact of science, engineering and technology (Ethical; National Science Foundation).

Nothing quite like these programs exists for the ecological and wildlife sciences. Even so, to the degree that the National Environmental Policy Act (NEPA) exemplifies precautionary approaches to policy making, it too mandates the consideration of crucial ethical and social values in the making of environmental policy (Ashford, 1999; O'Brien, 1999; O'Brien, 2000).

Contrary to the notion, then, that ethics and science are polar opposites in the formation of environmental policy, they are really two compass points along the same path (Lynn, 2006). Along with upholding truth and trust as core values, ethics helps science define best practices for implementing those values in research. Common examples of best practices include prohibitions against plagiarism, falsification of data, the manipulation of research results, as well as guidelines on avoiding and/or disclosing conflicts of interest, the prior restraint of knowledge, and self-censorship. Ethics also helps elucidate the best uses of science by tracking how the scientific research and technology produce more or less well-being in the world.

Findings

Findings are the conclusions reached as part of a authoritative inquiry -- academic, governmental, or otherwise. The term is a metaphor for discovering or uncovering something about the facts of an event or issue. Findings are vital in law and policy, as they determine the facts used to reach a legal or policy decision.[5] The idea of an *ethics finding* draws from these meanings. It is the result of an inquiry that vitally contributes to our understanding of a real world moral question or controversy. An ethics finding is not concerned with establishing scientific, legal or social facts per se. Rather it seeks to investigate the *moral facts* -- those real if intangible ethical beliefs, dispositions and concerns -- that are part and parcel of an issue. The discussions of the Barred Owl Stakeholder Group explored such a real world controversy with an eye to the moral facts that inform the management of barred owls in the Pacific Northwest.

These findings were elicited through a Quaker-style "sense of the meeting" process. After a thorough dialogue had explored the various dimensions of an issue, the facilitator (myself) briefly summarized what the participants agreed to and differed upon (the sense of the meeting), and asked if this summary accurately represented the participants point of view. These findings came in no particular order. I have arranged them in the following sequence to provide a coherent narrative.

The findings include the following, which are discussed in turn below.

- Science and ethics are complementary and equally necessary to understand the implications of barred owl removal.
- Reverence for life is a broadly shared value amongst those concerned with barred owl management.
- Compassion and the avoidance of suffering are crucial values when managing barred owls.
- Humans may or may not be culpable for barred owl in-migration, but they are responsible for protecting the well-being of both barred and northern spotted owls, as well as the biodiversity of forests.
- Barred owls may at some point become native to the Pacific Northwest. Whether they do or not does not change our ethical responsibilities to help the northern spotted owl.
- The threats facing northern spotted owls are of crisis proportions, and hard choices may be necessary.

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[5] In law, findings of fact are distinguished from conclusions of law. In the latter, a member or members of the judiciary applies the principles, statutes, and precedents of law to interpret the facts and reach a legal judgment (see Garner, 2009)

- Removal experiments may be justified, but they should be limited and humane, with a defined protocol conducted by professionals.

Presenting these findings up front (literally and figuratively) creates a chicken or the egg dilemma. Understanding these findings presupposes an understanding of the relevant conceptual tools from ethics. Discussing those conceptual tools first, however, will divert attention from the substance of this brief. With this in mind, I have kept the findings section as descriptive as possible, and phrased moral concepts in everyday language. A more detailed discussions of the relevant ethical concepts, their use in environmental policy, and their applicability to barred owl management is presented in the section, "An Ethical Toolbox for Owls".

Science and Ethics

When the Barred Owl Stakeholder Group began its discussions, many of its participants believed barred owl management was a simple matter of biological science. Barred owls were the invasive species that were either threatening northern spotted owls or being used to divert attention away from habitat degradation. Either eliminating barred owls or protecting more habitat were the obvious, scientifically sound actions to take. This perception quickly changed as we explored the various ethical values and questions embedded in this issue.

As noted in the previous section on ethics and environmental policy, science is an indispensable element of policy making. Science can show us the facts of a case, revealing the natural and anthropogenic forces that threaten natural and public goods. In so doing, it provides us information to help evaluate past, present and future policy-making. Science cannot, however, make our policy choices for us. Policy is as much about values as it is about facts. Whenever governments and other organizations undertake policy initiatives to improve economic growth, or protect public health, or preserve biodiversity (to name just three), they are acting upon a set of values they believe (or should believe) contributes to the public good.[6]

By exploring the various ethical dimensions mentioned below, all members of the Barred Owl Stakeholder Group came to see ethics as a useful if not necessary complement to science. Science helps us develop our causal knowledge about the natural systems affected by public disputes over values. Ethics provides us with the moral knowledge to make discriminating judgments between those values. Together

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[6] The fact that any system of policy making is susceptible to vested self-interest and corruption does not negate this point.

they hold forth the prospect of helping us triangulate on the best policies and management practices in our relationship to the environment.

Reverence for Life

In 1915 Albert Schweitzer coined the phrase *reverence for life*, and made this the foundation of his ethics (Schweitzer, 1987; Free, 1988). The concept has been interpreted in a variety of ways, from Christian mysticism and eco-theology, to Gandhian nonviolence and animal protection. I am not using the concept in any of these particular senses per se. Rather, the phrase captures how members of the Barred Owl Stakeholder Group manifested a shared wonder and esteem for the natural world.

For some, this translated into an abiding concern for the well-being of individual owls and their families. For others, it was the flourishing of native biodiversity and the maintenance of ecological integrity that moved them most. For still others, it primarily meant the livelihoods of local communities, as well as the public's relationship to the forest as a biological resource, a natural heritage, and a source of spiritual renewal.

Despite these differences in emphasis, there was a broad agreement that individual owls (and other animals), ecological systems, and human beings all matter from a moral point of view. While individuals might weigh one or another more heavily, all were part of a remarkable, intricate and threatened landscape. This deep respect and appreciation for living beings and life-forming processes is well captured in Schweitzer's phrase, reverence for life.

Because this idea was broadly shared, it made possible the bridging of moral and political differences over the barred owl. When the stakeholders first met, they came with well-formed policy positions on the causes and solutions to northern spotted owl survival in the wild. For some this included the elimination of barred owls, for others, the protection of all owls and the restoration of habitat. These policy positions were rooted in interpretations not only of the scientific literature, but also presuppositions about whose well-being counts from a moral point of view. Is it only people? The forest? Owls too?

For example, animal protectionists and wildlife rehabilitators in the group were strongly focused on the well-being of individual animals, and the harm that would befall barred owls in a removal experiment. Conservationists and environmentalists were strongly focused on native biodiversity, and believed individual owls may be sacrificed for ecological integrity. Yet no one really wanted to actively harm barred owls, much less cause them suffering. And over time, the fondness for owls as individual creatures, remarkable species, and apex predators was readily acknowledge by virtually

everyone. By identifying their common reverence for life, these groups came to see each other's focus as complementary. A previously unrecognized source of agreement was highlighted, which opened the door to win-win dialogue over how to balance the protection of owls, biodiversity, and the natural heritage of society.

Compassion and Suffering

The expression of a reverence for life did not mean the Barred Owl Stakeholder Group adopted an animal rights perspective, narrowly understood as the abolition of all human use and management of animals, wild or domestic. Instead, members either expressed or were willing to consider that barred owls and other creatures were part of a shared moral community. Within this moral community, the well-being of the owls and the flourishing of forests matter from a moral point of view. The ethical beliefs undergirding this view varied. Some were rooted in the cognitive ethology and social structures of owls themselves. Others were based on ecological insights into the inextricable interconnections between all forms of life. Still others were more spiritual in nature, wherein people, owls and the forest were part of a larger morally inflected reality.

Stakeholders with roots in the animal protection and wildlife rehabilitation community made a special contribution via their commitment to compassion. This took form in speaking up for the well-being of barred owls themselves, resisting experimental protocols that would too easily take the lives of owls without sufficient reason and reflection, pressing for a full consideration of non-lethal alternatives, and insisting that future policy or management decisions do everything possible to respect the physical and psychological integrity of owls. The prior identification of a common reverence for life helped members from other communities accept or sincerely consider the importance of compassion in barred owl management. Thereafter, the value of compassion and the avoidance of unnecessary suffering informed the rest of the group's discussions.

Culpability and Responsibility

One issue that vexed the Barred Owl Stakeholder Group was culpability and responsibility. Were humans culpable for the spread of barred owls into northern spotted ow habitat? If humans were culpable, what subsequent responsibilities might we have in light of this anthropogenic impact?

On the question of culpability, there was no agreement amongst the stakeholders. One outlook held that the burning of the prairies by the First Peoples/Native Americans delayed a natural range expansion of the barred owl from east to west. Another outlook claimed that European style farming and settlement created islands of habitat which

barred owls used to migrate west. In either case, the interspecific competition between barred and northern spotted owls was thus delayed or promoted by human action. A third outlook held that barred owl migration was by and large natural, even if it was hindered or promoted on the margins by anthropogenic causes. If an otherwise natural expansion was delayed by anthropogenic action, then the persistence of northern spotted owls in the Pacific Northwest may be an anthropogenic artifact. This is to say that the northern spotted owl may be a species that would have been extirpated in this portion of its range anyway.

A related concern was that culpability also raised the question of responsibility. Whether or not humans were culpable for the range expansion of barred owls, we certainly are responsible for the widespread habitat destruction and degradation that constitutes the primary, long-term cause of the northern spotted owls decline. Under this reading, there are still good ethical and ecological reasons we should act in defense of the northern spotted owl and afford it the protections of the Endangered Species Act. Their existence in the wild is arguable a natural and ethical good, contributing to long-term biodiversity, ecological integrity and the public's natural heritage. It was because of this felt responsibility that the group chose to not let the unanswered question of anthropogenic influence obstruct the wider finding that people have responsibilities for the well-being of the owls and the flourishing of their forest.

Becoming Native

Whether barred owls should be considered part of the native biodiversity of the forest was a companion issue to that of culpability and responsibility. Defining native biodiversity is a tricky matter. It involves establishing a temporal and spatial baseline by which to compare the composition, structure and function of a natural ecosystem. Where one draws those lines in history and geography, who one counts as being part of or alien to an ecosystem, is not an exact science. This is not to say it is merely one of opinion, especially self-interested opinion. Historical and contemporary studies of ecology can help us discriminate better from worse claims about native biodiversity. Rather this is to acknowledge not only limits to our certainty, but that the baselines change. Given enough time or a different space, a formerly exotic species may co-adapt to a new environment, new trophic webs and ecological patterns are established, and the species might now be considered native to its place (Noss and Cooperrider, 1994).

The point is driven home by considering human evolution and migration. Originating in the northeast portion of Africa, humans have expanded their range -- invaded the habitats -- of many other species. This includes other hominids, including the Neanderthals with whom some of our ancestors interbred. Until sometime in the late Holocene, humans were not present in North America. We were arguably an exotic,

invasive species when we crossed the Bering land bridge and sailed across the Pacific Ocean to inhabit North and South America. Does this mean that we are not native to any place on Earth except the Northeast corner of Africa from which our maternal ancestors arose? One might argue that case, but it would take an extreme interpretation of what it means to be native to justify believing it. So too, it would be an extreme interpretation to assume that barred owls might never be considered native to the temperate forests of western North America.

Whether or not barred owls are or may become native to the forests of the northwest was a matter of strong disagreement between individuals in the Barred Owl Stakeholder Group. Some argued that we are witnessing the establishment of a new biotic community. Barred owls are recent immigrant, but are nonetheless becoming native to the habitats of the Pacific Northwest. Others argued the opposite, that barred owls are an exotic species degrading native biodiversity, specifically the population of northern spotted owls. Until it can be demonstrated that barred owls do not threaten other forms of biodiversity, they should be considered as outsiders in the region's biotic community.

Out of this discussion emerged a third alternative. Barred owls are now so widely distributed throughout the Pacific Northwest that wildlife managers are unlikely to ever eliminate them from the landscape entirely. Unknown technologies in immuno-contraception or the like may change this in the future, but for now, and for better or worse, they are de facto members of the biotic community. In this respect, they are much like coyotes who, despite every effort to eliminate them wholesale from various landscapes, continuously increase their range (Cadieux, 1983; Fox and Papouchis, 2005; Way, 2007). In light of these facts on the ground, the task of environmental policy and wildlife management should be to help northern spotted owls cope with the threats of habitat loss and interspecific competition. This means maintaining viable and distinct breeding populations of northern spotted owls in the wild. This became the opinion of the majority of members over time.

Crisis and Triage

The Barred Owl Stakeholder Group was united in acknowledging the threats to northern spotted owls in the wild, including habitat destruction, barred owl incursion, fire, disease and climate change. There were different emphases on the importance of extant threats (e.g., habitat degradation versus interspecific competition) as well as the likelihood of future threats (e.g., avian diseases and climate change). Even so, there was no marginalizing of one threat or another in order to pursue the prospect of advantage in a future policy negotiation, or to blindly support the policy position of an agency, advocacy or industry group.

Moreover, the magnitude of these threats was judge severe enough to present a crisis scenario. This finding was based on the extensive evidence in the published literature, as well as the considered professional judgment of experienced agency, environmental, and industry scientists. The crisis was truly brought home during our field trip near Veneta, Oregon on 17 June 2009. As part of this field trip, the group discussed recent interaction studies focused on barred and northern spotted owls. A time-indexed series of GIS maps was used to visualize the inhabitation of forest stands by northern spotted owls before and after they began competing with barred owls. Both the spatial displacement of northern spotted owls, as well as the rapidity with which this process occurred, was astonishing to the stakeholders (see Appendix II: Consequences).

Thereafter, a triage situation was widely believed to exist. If northern spotted owls were to remain in the wild, urgent action was necessary. Triage is commonly associated with medicine, where degrees of urgency are assigned to the treatment of large numbers of patients. It implies that those with comparatively minor injuries are wait listed for treatment, those who have serious condition but are likely to survive are treated first, those less likely to survive are treated second, and those unlikely to survive are treated last, if at all. The point to make here is that triage is a not only a medical practice but a moral decision about preserving some life in difficult situations where not all life can be saved. As a threatened species, northern spotted owls are high on the priority list, both legally and morally. After all, extinction is forever. If the necessary treatment means others in the forest community may be negatively affected (e.g., barred owls), then that may be morally justified.

For some in the group, this was reason enough to justify the removal of barred owls. Reasoning that barred owls were a significant threat, they were willing to consider humane methods of removal in order to prevent the extinction of northern spotted owls, preserve native biodiversity, and contribute to ecological integrity. Others agreed that a state of triage existed, and agreed that removal may be justified. At the same time, they saw lethal removal as potentially inhumane, ineffective and ultimately counterproductive to other actions that might preserve forest habitat and create a brighter future for northern spotted owls. Redoubled measures at habitat protection and fire suppression were their management actions of choice. These two lines of thinking were well represented in the group as a whole, and held simultaneously by individuals who saw merit to both arguments. Out of this sense of crisis and triage developed a sharp focus on the removal experiments themselves.

Removal Experiments

In its first meeting, some on the Barred Owl Stakeholder Group expressed deep reservations about lethal methods for removing barred owls. Stakeholders hotly debated whether lethal removal was necessary, what alternatives to lethal removal might exist, and whether removing barred owls could ever be accomplished humanely. The focus of discussion thence turned to alternatives to lethal removal, and whether lethal methods could be humane (see Appendix III: Management Options).

Amongst the alternatives, the favoured options were protecting more northern spotted owl habitat, managing that habitat for them, supplementing their food sources, and diversionary feedings of barred owls. Unfortunately, because barred and northern spotted owls share overlapping niches, creating new habitat does little to resolve the specific threat of interspecific competition. Since owls eat live food, supplemental and diversionary feedings would also mean sacrificing a large number of mice, and exposing the northern spotted owls that remain to routine human interaction. The concern for mice elicited a bit of tittering early on, but as members thought through their reverence for life, concern for the well-being of the mice took on a more serious tone. Members agreed that mice should only be fed to owls if the management technique were effective in reducing interspecific competition. As this has yet to be demonstrated, supplemental feeding fell into disfavour.

Disrupting barred owl reproduction by oiling eggs or removing them is also an option. Unfortunately, this would not prevent barred owls from attempting to nest again, and continuing to occupy northern spotted owl habitat. Removing nestlings and sterilizing adults were also considered. High levels of stress and mortality from the capture and handling of nestlings and adults would be the likely result. This is arguably no better than straightforward lethal removal in many cases, and was therefore likely to be inhumane as well.

Stakeholders discussed translocating barred owls in some detail. While seemingly an attractive alternative, the likely stress and injury to owls during translocation, the poor survival rates of translocated individuals, the growing populations in other locales, and the possible genetic effects of cross-breeding sub-populations were all cause for substantial humane and ecological concerns.

This did not mean the stakeholders thought non-lethal methods should be abandoned. Rather, the crisis facing northern spotted owls requires a more immediate response. With this in mind, the group as a whole believed that continuing research into non-lethal methods should be a top priority, and conducted simultaneously with any lethal removal experiments.

When all the non-lethal alternatives had been considered, what remained was a proposal to kill barred owls with shotguns. This method of population management was envisioned in the 2008 recovery plan for the northern spotted owl, and the ethical implications of this proposal was itself one reason for the existence of the Barred Owl Stakeholder Group.

If the killing of owls was necessary, and most members of the stakeholder group agreed that it might be, the number and manner of barred owls killed was of special concern. These numbers were not precisely calculated at the time of our meetings. In the field experiments being proposed, professional judgment held that shooting hundreds of owls would do, spread over several field sites in Washington, Oregon and perhaps California.

Because of this, members of the group had a set of tough questions for the removal experiments. Was the scientific merit of the study areas and owls to be killed sufficiently rigorous to merit the removal experiments? What was the protocol for lethal removal? Could such killings be accomplished humanely? Who would conduct the removals? The group could not answer all these questions to its full satisfaction. Even so, it did develop strong leanings on the matter.

First, many of the stakeholders did not believe themselves competent to judge the full scientific merit of the removal experiment. Others noted that the experimental merit was unlikely to lay in clarifying how barred owls competitively interact with northern spotted owls. Those causal dynamics are arguably well understood, and it may be unnecessary to kill barred owls to replicate what we already know. Instead, the scientific merit of the removal experiments lay in identifying the most effective and least harmful means of removing barred owls for the benefit of northern spotted owls. There are a large number of variables to be considered here, and the stakeholders did not seek to interfere with the study design being developed by the Barred Owl Work Group. Nonetheless, they did ask that the USFWS clarify the study's methods and outcomes in the hopes of minimizing unnecessary harm.

Second, experiments on wild animals are frequently judged by different standards than those applied to laboratory animals. Laboratory animals in the United States and elsewhere are minimally protected by humane standards that can only be violated by an overriding need for experimental knowledge. This state of affairs exists elsewhere under different regulatory environments and with different degrees of stringency. The United States has one of the more permissive environments, the European Union and

New Zealand two of the more exacting, while Canada and Great Britain fall somewhere in between.

In the United States, it is common for experiments on wild populations to be exempted from detailed review by attesting that there will be no significant impact on the population of the species itself. This permits procedures to be undertaken on wildlife that would be subject to greater scrutiny if the creatures were laboratory animals. Currently, there are no regulations in the United States that vigorously protect the well-being of individual wild animals in field experiments. Many in the Barred Owl Stakeholder Group believed that the USFWS should take a strong leadership role in developing ethical guidelines for field experiments that explicitly take into account the well-being of individual wild animals (Brown, 1999; Monamy, 1999; Cooper and Cooper, 2001; Monamy and Gotti, 2001; Russow and Theran, 2003; Swart, 2004; Hadidian et al., 2006).

Third, if barred owls are to be killed, then the protocol for doing so is of central importance to the ethics of the removal experiments. The protocol should provide specific guidance on how to remove barred owls humanely. Capturing and chemically euthanizing barred owls was considered, but determined to be too difficult to accomplish in the field, and so stressful to the owls as to be inhumane. A quick and relatively painless death was preferable. The remaining alternative is to shoot these owls with shotguns under exacting conditions. No one was enthusiastic about this alternative, and yet few saw any other viable methods at this time. The detailed protocol in Appendix IV was developed by the Barred Owl Work Group in light of these concerns.

Finally, the very last thing the Barred Owl Stakeholder Group wanted to see was an open season on barred owls undertaken by untrained hunters who might hurt themselves, other hunters and non-target wildlife. Nor did they want the participation of the United States Department of Agriculture's Wildlife Services, whose track record on killing animals is so deeply checkered by inhumane past practice and present controversy. Instead, stakeholders strongly preferred the use of professional sharpshooters expressly trained in a protocol developed for barred owl removal. The bodies of those barred owls killed should be recovered and donated to a suitable scientific or educational institution. This was variously described as a way to honour the sacrifice of those owls (a best practice in laboratory animal and veterinary research settings), educating the public in natural history, and contributing to other forms of scientific research. The unifying sentiment here was that their deaths would not be in vain.

Future Considerations

This is not the first nor will it be the last time that the USFWS or another wildlife management agency faces difficult questions of removing one species for the benefit of another. Assuming the removal experiments move forward and are successful, a policy of managing barred owls through removal may be one of several options chosen by the USFWS to benefit northern spotted owls. In light of the previous finding and insights from the stakeholder process, what lessons might be applicable as future considerations for barred and northern spotted owl management?

Embrace Moral Complexity

Balancing the harm done to individuals against the benefits to a group is one of the most difficult and contentious issues in ethics. In public debate, this can take the form of an ideological division between animal rights and traditional conservationists. The former focuses on the individual moral rights and liberty of animals, while the latter emphasizes the management of populations, species and ecological communities. These positions represent moral extremes, and neither is suitable on its own to grapple with the conundrums posed by barred owl management, much less other hard cases where any choice entails harm of one sort or another.[7] Such moral complexity should not be an excuse for inaction or dogma. It is, instead, an opportunity that calls for good faith and situated ethical reasoning about how we fulfill our moral responsibilities to people, wildlife and biodiversity.

Periodic Ethics Reviews

During the stakeholder process, the USFWS asserted its commitment to undertaking another EIS on a final policy and management plan for barred owls. As part of this, the USFWS should also re-review the ethical implications. The scale and extent of barred owl removal as part of a post-experimental management plan may be be quite different than that of the experiment itself. Those differences deserve ethical evaluation.

Additionally, the USFWS uses adaptive management to fine-tune its policies and management practices in a progressive and iterative process. With this in mind, the full range of ecological, social and ethical values should be incorporated into the adaptive management at appropriate intervals. This will give both the USFWS and the public an

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[7] There is an emerging discourse of *compassionate conservation* in wildlife management that attempts to negotiate between these two positions. See the Born Free Foundations website on compassionate conservation (http://compassionateconservation.org), and the Compassionate Conservation Symposium held at Oxford University (http://www.bornfree.org.uk/comp/compconsymp2010.html).

opportunity to identify ares of current success, future improvement, and best practices that have been implemented or will be undertaken.

Humane Methods

As discussed in the findings, the prospects for non-lethal removal of barred owls is poor at this time. A variety of ecological, economic and technical problems have yet to be overcome in finding effective, long-term and non-lethal means of removing these owls. Management techniques that are not directly lethal (e.g., capture and release) may also carry a high if indirect lethality. These should not be considered as non-lethal. As it stands, barred owl management will by and large be accomplished through lethal means.

With this in mind, removing barred owls should be as humane as possible, where this is understood as using those methods that produce the least physical harm and psychological suffering. This maxim applies to both lethal and non-lethal removal. While arguably justifiable as benefiting northern spotted owls, the harm to be done individual barred owls cannot be overlooked. If harm is to be done to barred owls, then it must be as humane as possible.

Non-Lethal Alternatives

If this removal is successful, it may eventually lead to a policy of removing many thousands of barred owls each year in the Pacific Northwest. That level of killing, especially as it accumulates over time, should be of significant concern to all. All the more so if the benefits to the northern spotted owl turn out to be marginal or non-existent. "Doing something" for northern spotted owls does not justify an unlimited killing of other creatures. Instead, it requires a very difficult moral judgment.

The legitimacy of using lethal methods arguably rest on exhausting non-lethal alternatives. Targeted immuno-contraceptive for barred owls is an example of a method that would avoid the moral conundrums raised by lethal removal, despite it being entirely speculative at this time. To date, the USFWS has done its best to explore the non-lethal alternatives. Even so, the USFWS and its academic partners should continue active and ongoing research into non-lethal methods of barred owl and wildlife management.

Humane Endpoints

Humane endpoints are established to avoid prolonged suffering and ongoing harm without medical or scientific benefit. The practice is rooted in our collective experience with human and animal experiments gone bad, whose manifest suffering and lack of countervailing good egregiously violates the psychological, physical, and social well-

being of the subjects themselves. Unethical experimentation also coarsens people to the suffering of others. Humane endpoints are one attempt to respect the intrinsic value of all research subjects, while cultivating our ability to respect that intrinsic value.

Defining terminus points for ending an experiment is a standard protocol in animal testing. When an experiment will yield sufficient results, produce no further significant results, or causes harm without counterbalancing good, then the experiment has reached an endpoint and should be halted. If barred owl removal has a positive impact on the population of northern spotted owls, then the benefits arguably outweigh the harms. If those benefits do not appear, are insignificant, or substantially diminish over time, the ethical justification for killing barred owls becomes correspondingly weak or non-existent.

Even the most humane methods can have unacceptable consequences, especially when practiced over a long period of time. When negative outcomes outweigh positive consequences, then it is time to stop and rethink one's policies and practices. Humane endpoints are thus a firebreak that will help the USFWS implement the removal experiment while meeting its ethical responsibilities to all the species under its care.

Collect Data

All good policy is informed by the specifics of empirical cases. This is true of environmental policy, and is no different when that policy is informed by ethics. A straightforward and common sense implication, then, is that data on the welfare of barred owl be collected during the experiments. Important information might include the number of barred owls killed, the time, place and manner of their killing, the number of recovered owls shot dead or wounded, the number unrecovered or escaped, the estimated impact on barred owl nestlings including predation and starvation, and so on. Over time, this data will help the USFWS and the public evaluate the ethical implications of the removal experiment.

An Ethical Toolbox for Owls[8]

In order to fully appreciate the ethical findings developed through the Barred Owl Stakeholder Group process, one needs to be familiar with a set of ideas common in ethical theory. Think of these ideas as *conceptual tools* that can be used in virtually any case where the well-being of people, animals or nature is at stake. Like any tool, one needs to know what it is and how to use it before one can become skilled in its practice. While these may not be the only tools of use, they are indispensable to understanding ethical issues about the environment and wildlife (Midgley, 1996, 1-14.).

These ideas were introduced to the participants through prior readings and the ethics and policy training workshop, as well as through individual conversations and the focus group conference calls. These ideas were selected as being especially informative for the debate over barred owl management, based on their use to understand other controversies in environmental policy and wildlife management. They also served as a lingua franca, so that the participants might better reflect on their own moral presuppositions, as well as to think together on the ethical issues before them.

Moral Agents and Moral Beings

Human beings are probably the only creatures on Earth who have abstract systems of thought labeled ethics. In this sense, ethics is an artifact of human culture. This does not mean, however, that our ethical considerations must exclude other creatures like owls. One need not be a moral agent to be a moral being. *Moral agents* are able to think about and act on ethical decisions. *Moral beings* should be considered from a moral point of view. While all moral agents are also moral beings, the opposite is not true. Infants, the insane, and people otherwise incapacitated are not fully or even partially capable of the reflection necessary to think and act morally. Yet we rightly extend them moral consideration, believing they must be treated in an ethical manner without demanding that they exercise independent moral judgment (see Feinberg, 1981; Goodpaster, 1978).[9]

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[8] This section draws from my article "Contested Moralities" (Lynn, 1998b).

[9] This distinction between moral agents and moral beings emerges from "the argument from margin cases", and is one of the older insights of animal and environmental ethics. Such cases are not marginal because they are unimportant, but because they push the boundaries (margins) of ethical thinking. They are hard cases that test and often break safe and familiar arguments in ethics, which so often presume adult, rational human beings.

Moreover, many traditions of both western and non-western thought believe we are part of a larger moral community, one in which people have an obligation to consider the well-being not only of themselves, but of non-human animals and nature as well. Judging by the growth of animal and environmental protection organizations, this is an increasing concern in our own society. It is also one that drives many of the controversies involving environmental policy and wildlife management (Underwood, 1994; Peterson, 2001; Preece, 2005).[10]

Moral Value and Moral Community

To understand this growing concern from an ethical perspective, we need to know something about the concepts of *moral value* and its implications. Indeed, these are the two primary stars that guide most practical moral reasoning. If you look for them in public and scholarly debate, you will find them as either explicit positions or tacit assumptions (Lynn, 1998a; Jamieson, 2008, 145-180.)

The term value derives from the Latin *valere* (to be strong, worthy) and connotes worth, goodness, or desirability (Runes, 1982, 346.). It is also a word with complex meanings, referring to personal, economic, social and moral values (to name a few). At the most basic level, *values* are those things (e.g., objects, beliefs, behaviours) that we think are important. For our purposes then, *moral values* are those things we believe important for moral reasons.

For example, I might say fairness or human dignity are moral values because they are important to protecting the well-being of other people. I might say that awareness and self-awareness -- sometimes termed *sentience* and *sapience* -- are moral values because creatures like ourselves who have these properties can be helped or harmed by our actions. Our awareness (sentience) allows us to feel, as well as to experience physical suffering. Our self-awareness (sapience) opens up even more possibilities, including fear, grief, empathy, reason, and social interaction (to name a few). In both these

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[10] Throughout this brief I use the terms animal, non-human animal, other animals, and related terms and phrases interchangeably. I do for the sake of clear expression, as well as to remind readers of the punctuated continuities between the biological, social and cognitive elements of human and non-human life. We are distinct from other life forms in a myriad of ways, but not so different as some would like to think. I also use the phrase people, animals and nature (or some variant) with frequency. I do so not because I think there is some essential difference between the three. People, after all, are animals and parts of nature. Rather I do so to emphasize three distinct spheres of life that are the focus of moral and policy concern today.

examples, what is of moral value helps us think and act in an ethically responsible manner (Lynn, 1998b, 226-228.).

Views on moral value lie at the core of ethics, and the reason for that is simple. Moral value, by whatever explicit or implicit name, is the criterion by which we determine who or what has *standing* in the *moral community*. Our beliefs about the moral value of people, animals or nature -- the reasons we would give for saying someone or something is morally valuable -- are used to decide who is inside a moral community and who is outside that community. If someone or something is inside the moral community, then it has to be considered from a moral point of view. If it is outside the moral community, then it doesn't have to be considered from a moral point of view.

Moral value also serves as the primary criterion with which to assess the *significance* of a moral issue, that is, the relative importance of competing ethical claims or concerns. In any moral community, there are going to be a variety of issues that need addressing, including how to distinguish and prioritize different moral issues from one another. While there are certainly many criteria to choose from -- immediacy, intensity, scale, magnitude, long-term impact, and so on -- the perceived moral value of the people, animals or nature in question also plays a role. If humans always come first, then that helps rank the issues that a human community will address as its first order of business. If you disagree that humans always come first, then you might assert a different ranking of issues (Fox 1990: 149-196; Simmons 1993: 124-125).

A human analogy may clarify all of this. Our society seeks at least minimal protections for human subjects in scientific research. The justification for this is human rights and civil liberties, both of which are rooted in the dignity and worth of human beings. When translated into ethics-talk, we say that people have moral value. As feeling and thinking creatures who can be helped or harmed, we believe we should treat other people with care and respect. Taken as a group, human beings are part of a *moral community* -- the community of all those who should be considered from an ethical point of view. In this moral community we have not only rights but responsibilities to others. It is for this reason that our society has instituted research rules and human subjects review committees to ensure informed consent, psychological and physical integrity, and justice for vulnerable populations. There are related rules in animal subjects research, though they are not so stringent as they are for humans. This is particularly true in wildlife research, where the claim that no impacts on the population of a studied species is routinely used to bypass significant ethical review (Rollin, 2006).

So too, moral value motivates ethical concerns for wild and domestic animals. The range of species and their differences makes it impossible to simply map human ethics

onto animals. We cannot think about or treat people and owls as exactly or even mostly alike. Still, if we are to take seriously everyday experience and ethological research, many lineages of animals are, to varying degrees, feeling and thinking creatures. Humans themselves are a distinctive group of animals whose feeling and thinking are the prime reasons we treat each other (or should) with dignity and respect. Because of their sentience and/or sapience, many non-human creatures have a moral value that deserves consideration and inclusion in a *more than human* moral community (Bekoff, 2006; Allen and Bekoff, 2007).

The idea of moral community is hardly alien to those working in the environmental and wildlife fields. Similar ideas are expressed in Charles Darwin's thoughts on the moral and social continuity of humans and other animals. So too by Aldo Leopold discussed humanity's place as a "plain citizen" in a larger community of animals and nature. Both Darwin and Leopold posited ethics as an emergent property of an evolved sense of care and responsibility contributing (but not reducible) to individual and group fitness. Indeed, many ethicists (including myself) look to the facts of evolutionary biology and ethological studies to both explain the existence and justify the importance of ethics in human society (Leopold, 1968; Darwin, 1981; Midgley, 1993b).

Finally, the *expanding circle* is a popular metaphor for visualizing a broader moral community. The idea behind the expanding circle is that we human beings have steadily learned to expand our understanding of who belongs within the moral community. From self, to family, to tribe, to nation, to the family of humankind, the expanding circle is a key element of what the philosopher, Immanuel Kant termed cosmopolitanism. Kant believed that the expanding circle of the human moral community would eventually lead to perpetual peace. Global activists call upon these cosmopolitan sensibilities when they urge the compassion, respect and solidarity with other human groups around the world. Indeed the expanding circle is the root metaphor behind the claims for universal human rights, enshrined in the French Declaration of the Rights of Man, the American Declaration of Independence, and the United Nations Universal Declaration of Human Rights.

In a related vein, some ethicists believe a moral cosmopolitanism is necessary to overcome a myopic concern for humans alone. The idea here is that the circle should expand beyond humanity to encompass a larger circle of life (Nash, 1989, 3-86; Lynn, 2002; Sheppard and Lynn, 2004; Singer, 2011) The moral wisdom of ancient and aboriginal peoples is of special relevance here. Specific worldviews may not map over precisely or even comfortably to current discourses of animal, environmental or sustainability ethics. Yet for many of our world's oldest cultures, animals were always

part of a larger moral universe that helped define ethical conduct here and now (Peterson, 2001; Harvey, 2005).

Intrinsic, Extrinsic and Co-Values

A key set of distinctions about moral value is between intrinsic, extrinsic, and co-values. These are terms used to distinguish whether something that has value in and of itself, is valuable because of its usefulness, or is valuable for both intrinsic and extrinsic reasons.

The idea behind *intrinsic value* is that one has importance or worth in and of oneself. Such value is intrinsic or "inside" oneself, and is not dependent on the use others have for us. To put it another way, we are an end in and of ourselves, not a means to someone else's ends. This reasoning has been applied to both individual people and animals, as well as to social groups and natural systems.

People have intrinsic value because we are intelligent and social creatures - we think, feel and relate. We are aware of our surroundings as well as our individual selves, which is to say we are both sentient and sapient. This is why we are termed *Homo sapiens sapiens*, the "wise earthly ones". Because of this marvelous consciousness, we have an individual worth independent of the use anyone has for us. This belief in our intrinsic value is the core reason why we are taught to treat people with respect, and why we have developed ethical principles to guide our thought and behaviour. Our well-being can be helped or harmed by others as well as by environmental and social policies. It is no wonder then that love and friendship, democracy and justice, pollution abatement and environmental health, are so important. They are interpersonal and institutional ways that help us treat individuals and communities with the respect that moral agents like ourselves deserve.

Since creatures like owls are not human beings or moral agents, some believe they cannot have intrinsic value. Instead they have *extrinsic value*. The functional roles played by owls in ecosystems is one example of the extrinsic value of owls. Another is the benefits or costs of owls to some group of human beings, even if those people argue over whether owls are a blessing or a curse. To have extrinsic value, then, is to be of use (or disuse) to someone or something else; one's value is extrinsic or outside of oneself. One is thus a means to someone else's end, and not an end in oneself. When owls are seen in terms of their extrinsic value, they remain outside the moral community.[11]

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[11] There are a variety of loose synonyms for intrinsic and extrinsic value. The most common terms are *inherent worth* and *instrumental value*, respectively.

Frequently, the extrinsic point of view asserts that we should manage owls as a "natural resource" requiring "rational" wildlife management as driven by "science". This is coded language. It implies that owls are no different than any other agricultural commodity, which is indeed the metaphor Aldo Leopold used to frame his original understanding of wildlife management (Leopold, 1986). People who think of owls as having intrinsic value are accused of being muddled, emotional and irrational.

Ethically, however, there is a problem with claims that owls or any other non-human creature is only of extrinsic value. The wisdom of native cultures, cognitive ethology and common sense tells us that many other animals are both intelligent and social creatures. Studies in cognitive ethology indicate that to a degree appropriate to their species, birds are creatures that are indeed sentient (aware and feeling) and sapient (self-aware and thinking). Assuming for the moment that this is true of owls, the well-being of owls can therefore be helped or harmed too, most particularly by human actions. From this point of view, owls have their own intrinsic value, and are thus members of a more that human moral community. They may not be moral agents with the capacity to make moral decisions and take ethically guided actions. Still, they are moral beings worthy of respect. That their consciousness is quite different from our own, is not an argument for denying their intrinsic value, or excluding them from the moral community, but for treating them in a way that is appropriate to their kind.

The concept of concurrent values or *co-value* creates a bridge between intrinsic and extrinsic value. Instead of being forced to choose between one or the other, co-value recognizes that both forms of value can simultaneously exist in the same person, animal or aspect of nature. One can thus be both an end in oneself, as well as a means to other ends. Thus a forest ecologist may argue that owls have an extrinsic ecological value as a top avian predator, while an animal advocate may argue that individual owls have intrinsic value irrespective of their functional role in an ecological system. Co-value acknowledges they may both be right.

Co-value is something people are quite adept at navigating. We are familiar with the instrumental value agencies, corporations and other organizations have for us as employees. Indeed, our frustrating interactions with a bureaucrtic department of "human resources" makes this point abundantly clear. At the very same time, we are quite aware of our own intrinsic value, and seek out others who value us as such. The love of a child, the care of a parent, the devotion of a dog, are all examples of the latter. We manage the tension between these concurrent values through griping, legal action, political activity, social protests, or otherwise rebelling when other's extrinsic value for us overbalances our intrinsic value.

The simultaneous existence of intrinsic and extrinsic value creates the possibility of *sad goods*. An example is the best way to explain this. Predation between animals is sad because it involves suffering and the taking of an individual's life. The prey of owls and wolves, for instance, are frequently both aware and self-aware. They are not only members of a population or species, they are sentient and sapient individuals. Their behaviour in the face of being stalked or attacked -- fight or flight -- certainly says something about how they value their own lives, if only in a deeply felt and embodied way. It is a strange myopia of a bloodless science that would deny the sensibilities deer and wood rats have about their own life-world. Thus when a wolf kills a fawn, or an owl snatches a rodent, it is not as simple as a surplus animal having been harvested. That is bloodless agro-economic language of wildlife management designed to anesthetizes us from the loss of life involved. Rather, an individual life has been taken.

Even so, predation is good because it is a dynamic and indispensable part of nature. Predation is an evolved and ecologically necessary process, part of the trophic (feeding) structure of the biotic world. Food webs of plants, herbivores and carnivores literally pass-on energy derived from the sun and recycle material derived from the earth. Predation is necessary for the well- being of predators *and* prey, as well as the ecological communities of which they are a part. It is a sad good. (Rolston, 1988, 56-62; Lynn, 1998b).

Visions of the Moral Community

Using the distinctions between intrinsic, extrinsic and co-values, we can describe four visions of moral community that commonly surface in debates over animal-based diets, hunting and trapping, environmental policy and wildlife management (to name a few) -- anthropocentrism, biocentrism, ecocentrism and geocentrism.[12]

Anthropocentrism claims that intrinsic value is found only in human beings, and thus only human are ends in and of themselves. An anthropocentric view is one that is human centred, to the exclusion or near exclusion of animals and the rest of nature. Non-human animals and systems like barred owls and forests have extrinsic value, and are means to human ends, resources to use as we please. Anthropocentrism's vision of the moral community is thus restricted to human beings. Only people have moral standing and significance, and are the subject of direct moral responsibility.

In contradistinction to anthropocentrism, there are other visions of the moral community. All of these are non-anthropocentric, in the sense that they find intrinsic

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[12] In other publications, I have used the term *value paradigms* to name these visions of the moral community.

value in animals and/or the rest of nature. They differ amongst themselves, however, over the standing and significance of nature's parts and wholes.

Emphasizing the parts, *biocentrism* emphasizes the intrinsic value of individual animals, particularly higher order animals that are sentient and/or sapient, such as owls, people, wolves and wood rats. While individual animals have intrinsic value, inanimate nature (e.g., rocks, soil nutrients) and nature considered as systems (e.g., biotic communities, biomes) have an extrinsic value for those life forms. Thus while people and owls may be members of the moral community, the old-growth forests in which owls might live or people might work lay outside that community. This is not to say a population of owls or a community of people are not important, but they are important only insofar as they promote the flourishing of individual lives.

Ecocentrism reverses this emphasis, and stresses the ecological wholes of nature. It is a vision that intrinsically values populations, species and living systems, while placing only extrinsic value on the individuals that constitute ecosystems and interact with the abiotic aspect of the atmosphere, hydrosphere and lithosphere. Individuals are of instrumental values as functional units of ecosystem processes and services, e.g., energy flow, nutrient cycles, speciation, food sources, and so on. Thus while the forest may have intrinsic value, the owls and people making their living there are of instrumental concern in so far as they contribute to the ecological health of the forest (Fox 1990; Rolston 1988; Taylor 1986).

The final vision of the moral community is that of *geocentrism*.[13] Geocentrism finds intrinsic and extrinsic value in people, animals and nature. It does so at multiple scales, in individuals and society, as well as in ecological communities and ecosystems. This means that intrinsic value is widely dispersed, from this person and that owl, to human communities and owls as a species, to cultural and natural systems. Geocentrism highlights how the other visions of the moral community artificially restrict the value-richness of our world. The other visions do so by making *a priori* judgments about what has or does not have intrinsic value. For anthropocentrism it is humans, for biocentrism it is individual animals, and for ecocentrism it is ecological communities and ecosystems. These *a priori* judgments obstruct equal consideration of moral values that lay outside their ambit, and impoverish our understanding of the value rich and pluralistic world we inhabit. Geocentrism considers this a set of false choices, and leaves the doors of ethics and policy open a broad set of co-values.

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[13] Some advocates and academics use the terms biocentrism and ecocentrism to mean geocentrism as it is defined here. This can lead to confusion if we only hear the terms themselves, instead of listening for their underlying meaning.

One common mistake is thinking that the non-anthropocentric visions would have us treat people, animals and nature in exactly the same way. Rather they ask that we give equal consideration to non-human forms of moral value. Amongst non-anthropocentrists there is a healthy debate over the degree and kinds of value to be found amongst the various parts of nature, e.g., animal, species, ecological community, ecosystem. Preference is generally given those creatures who are highly aware and self-aware, endangered species, and distinctive ecological communities and ecosystems.

Owls, for instance, have no capacity for democracy or advanced learning. We would not extend to them voting rights or tuition benefits. To do so would be inappropriate and irrational. What the non-anthropocentric moral visions do ask is that we recognize the intrinsic and/or extrinsic value of owls as individuals and a species, and treat them in a way that is morally appropriate to their kind. To protect their habitat, do them as little direct harm as possible, and make right anthropogenic threats to their survival, are three possible examples of morally appropriate treatment.

I hasten to point out that the map is not the territory. The visions of moral community do not map over perfectly onto one organization or another, much less to the individuals involved in those organizations. The point here is not to create an easy typology by which to categorize individuals and groups. That leads to over-interpretations of their thoughts, actions and policy positions. Rather it is to reveal the role that ethical presuppositions play in real-world policy and management contexts. Using these conceptual tools we can better describe and explain the orientations we as individuals and policy communities bring to such debates.

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These were not the only ethical tools discussed by the Barred Owl Stakeholder Group. Rather they were the requisite points of departure from which to explore the ethics of any environmental policy that affects the well-being of individuals and the flourishing of communities. Even so, the scope and depth of our ethical discussions was quite remarkable. This dialogue took place over meals, in small group exercises, during the field trips, over the phone during conference calls and focus groups, and in round table seminars. Overall, the sheer diversity of the ideas covered is a testament to the good faith and hard work of the participants, and the serious and sustained support of the USFWS. A comprehensive list of the ethical ideas discussed at length is found in "Appendix IV -- General Summary of Ethical Concepts Relating to Barred Owls".

Significance
Currently threatened throughout much of its range, a variety of anthropogenic and natural forces may soon drive the northern spotted owl to extinction in the wild. The interspecific competition between barred and northern spotted owls is a key factor in this situation. If the northern spotted owl is to be preserved in the wild, then the removal of barred owls from specific areas is one possible management option. The barred owl removal experiment is designed to test the efficacy of this option.

The experimental removal of barred owls will undoubtedly harm many barred owls. This harm will not pose a threat to the species as a whole, and the harm done individual barred owls is arguably outweighed by the good it may do for northern spotted owls. Such a calculation does not mean barred owl removal is morally neutral. Rather it means that hard cases -- situations where one must choose between difficult and morally painful options -- are a fact of life in environmental policy, wildlife management, and ethics.

It is for this reason that the USFWS formed the Barred Owl Stakeholder Group and contracted with an ethicist (myself) to help them understand the ethical issues embedded in the barred owl removal experiment, and by extension, future decisions on managing barred owls in recovery plans for the northern spotted owl.

Using a mixed methods approach to policy dialogue, the stakeholders undertook ethics training, interviews, focus groups, field trips and roundtable discussions. This enabled them to identify, clarify and evaluate significant ethical issues attending to the experiment itself, and provide ethical guidance for the development of environmental policy and management regarding barred owls in the Pacific Northwest. Key findings include:

- Science and ethics are complementary and equally necessary to understand the implications of barred owl removal.
- Reverence for life is a broadly shared value amongst those concerned with barred owl management.
- Compassion and the avoidance of suffering are crucial values when managing barred owls.
- Humans may or may not be culpable for barred owl in-migration, but they are responsible for protecting the well-being of both barred and northern spotted owls, as well as the biodiversity of forests.
- Barred owls may at some point become native to the Pacific Northwest. Whether they do or not does not change our ethical responsibilities to help the northern spotted owl.

- The threats facing northern spotted owls are of crisis proportions, and hard choices may be necessary.
- Removal experiments may be justified, but they should be limited and humane, with a defined protocol conducted by professionals.

While not exhaustive, these findings suggest that the USFWS take several future considerations into account when managing barred owls or any other species for the benefit of another.

- Embrace the moral complexity of the issues.
- Conduct periodic ethics reviews of wildlife policy and management practices.
- Chose the most humane methods of management whenever possible.
- Continue to develop non-lethal methods of management.
- Establish humane endpoints for all experiments on wildlife.
- Collect data on animal welfare to monitor the impact of policy and management.

There are two remaining lessons of significance that arise from the Barred Owl Stakeholder Group.

The first is the pathbreaking role this ethics review plays in environmental policy and wildlife management. The USFWS is to be commended for having the vision and wisdom to understand that they needed to apprehend the ethical concerns about barred owl management, in order to fully understand the ecological and social impact of the removal experiment. No society or social group can be abstracted from the moral norms that inform our individual and collective behaviour. Ethical concerns are thus inextricably embedded in a wide variety of environmental issues that come before the USFWS. The stakeholder group serves as a template for how to study and incorporate ethical insights into environmental impact statements.

The second is the growing recognition in policy communities, including the USFWS, that good environmental policy and wildlife management is never the product of science alone. Science helps us understand the causal dynamics of the world and our options for policy and management interventions. It cannot make, however, the value-based choices that lay at the heart of all public policy decisions. Good policies and management are always the product of science and ethics as complementary and mutually informing discourses. The stakeholder group illustrates how this can be implemented in an efficient, respectful and productive manner.

Note on Appendixes

The information in the following appendixes was distributed as handouts at the final meeting of the stakeholders in Eugene, Oregon on 17-18 July 2009. Their purpose was to remind the members of the Barred Owl Stakeholder Group of the ethical, ecological and technical information that had been covered in the previous meetings, training seminar, and focus groups.

Four handouts were distributed at the beginning of the meeting, each of which was assembled by members of the Barred Owl Work Group (Kent Livezey, Paul Phifer, Jim Thrailkill, John Buchanan) and myself (William Lynn).

Appendix I -- Consequences [Hypotheses and Outcomes of Barred and Northern Spotted Owl Interaction]
Appendix II -- Management Options
Appendix III - Protocol Elements
Appendix IV -- General Summary of Ethical Concepts Relating to Barred Owls

Appendix I -- Consequences
[Hypotheses and Outcomes of Barred and Northern Spotted Owl Interaction]

What are the consequences to Northern Spotted Owls due to Barred Owls?
Compiled by the Barred Owl Work Group (from Courtney et al 2004).
See Gutierrez et al. 2007 for additional thinking on the subject.
June 2, 2009

The following hypotheses represent a range of possible outcomes with respect to the Barred Owl's effect on the Northern Spotted Owl. This is not an exhaustive list of potential outcomes; rather, this list is primarily intended to illustrate a range of potential outcomes relative to interspecific interactions.

Hypotheses	Outcome	Evidence
1. Barred Owls will replace the northern spotted owl throughout its range (behavioral and competitive dominance hypothesis).	Clearly Plausible	A failure to reject this hypothesis clearly confers the most serious risk to the Northern Spotted Owl. The panel was in disagreement about the likelihood of this outcome. The evidence in favor of this hypothesis was both theoretical and observational (empirical). A position favoring this outcome is based on the theoretical prediction that the similarity in morphology, diet, and feeding habits of these two species will lead to strong competition if not competitive exclusion. In addition, there is no indication at this time, based on field observations from the northern part of the range, that Barred Owls are limited to specific habitats; 1) that they appear to be increasing across most of the range, 2) that they occasionally hybridize with Spotted Owls, and 3) that there are anecdotal observations that Barred Owls are behaviorally dominant to Spotted Owls. A position not favoring this outcome is based on the lack of information about the process of (or lack thereof) presumed displacement of Spotted Owls by Barred Owls, a lack of knowledge about the synergistic effects of weather, past habitat loss, and Barred Owls on loss of Spotted Owls, the lack of increase in Barred Owls in the southern part of the range, and the anecdotal data that Barred Owls might be stabilizing in number in some northern areas of the range. In addition, there are no explicitly designed studies of interspecific interactions, displacement probabilities, trends and abundance estimates of Barred Owls, diet similarity in all areas of sympatry, physiological tolerances of Barred Owls, and detailed mode of foraging of either species (such information could be key to predicting the strength of the Barred Owl threat). Moreover, much of the data we have concerning Barred Owls effects on Spotted Owls are confounded statistically. All of the former favoring categories bode poorly for Spotted Owls, while all of the latter suggest that Spotted Owls might be capable of neutralizing the competition in certain habitats or parts of its range.

Hypotheses	**Outcome**	**Evidence**
2. Barred Owls will replace the northern Spotted Owl in the northern, more mesic areas of its range (moisture-dependent hypothesis).	Clearly Plausible	This alternative has support from the panel because the pattern of Spotted Owl decline is strongest in the northern part of the range and less in the south. However, the panel recognized that this difference could simply be due to the phase of colonization in more southern areas.
3. Barred Owls will replace northern Spotted Owls over much of its range, but the Spotted Owl could persist in some areas with management intervention (management hypothesis).	Clearly Plausible	Barred Owls and Northern Spotted Owls will compete, with the outcome being an equilibrium favoring Barred Owls over Spotted Owls in most but not all of the present NSO habitat range (quasi-balanced competition hypothesis). This alternative has support from the panel as a viable hypothesis because such situations have occurred in other species.
4. Barred Owls will replace northern Spotted Owls over much of its range, but the Spotted Owl will persist in refugia (refugia hypothesis).	Not Plausible or Clear	This alternative is unlikely because should Barred Owls effectively colonize all the range of the Spotted Owl, no refugia are conceived that could allow persistence of Spotted Owls without some Barred Owl presence or interference.
5. Barred Owls will replace northern Spotted Owls in the northern part of its range but the Spotted Owl will maintain a competitive advantage in habitats where its prey is abundant and diverse (specialist vs. generalist hypothesis).	Plausible	The Barred Owl will replace the Northern Spotted Owl over much of its range, but the Spotted Owl will persist in some areas with management intervention (management hypothesis). If Alternative Hypothesis 1 appears to be a reality, Northern Spotted Owls could very likely be maintained in limited areas by control of Barred Owls. This would be particularly true in areas that are isolated or otherwise "defensible" (e.g., National and State Parks in Marin County, California).

Hypotheses	**Outcome**	**Evidence**
6. Barred will replace Spotted Owls only where weather and habitat change have placed Spotted Owls at a competitive disadvantage (synergistic effects hypothesis).	Plausible	This alternative could be explored by defined studies investigating key areas of uncertainty, but is not implausible given the specialist nature of the Spotted Owl, and its rather limited prey base in the northern part of its range. Limited evidence on food habits suggests that there may be some food partitioning occurring, at least in the northern part of its range where Spotted Owls take more arboreal mammals than do sympatric Barred Owls.
7. Barred Owls will replace northern Spotted Owls in some habitats but not in others (habitat hypothesis based on structural elements of forest, which confer a maneuverability advantage to the smaller Spotted Owl).	Not Plausible or Clear	Although this alternative is not entirely implausible given the ability of Spotted Owls to inhabit some very dense habitats (e.g., second-growth redwood forests, complex structured mixed conifer forests of the Klamath Mountains), the similarity in wing loading between the two species suggests that Spotted Owls may not have greater maneuverability that Barred Owls.
8. Barred Owls and Spotted Owls will compete, with the outcome being an equilibrium favoring Barred Owls over Spotted Owls in most but not all of the present NSO habitat range (interference competition hypothesis).	Not Plausible or Clear	This alternative is not clear given the anecdotal evidence that this may be occurring in at least one area (but the data are not extensive), and this pattern has been seen in other invasive species.

Hypotheses	**Outcome**	**Evidence**
9. Barred Owls will increase to a peak number, then decline or stabilize at a lower density, which will permit the continuation of Spotted Owls (dynamics hypothesis).	Not Plausible or Clear	This alternative is not inconsistent with the current state of Barred Owl expansion and Spotted Owl ecology (they are known to be negatively affected by weather and habitat loss), where northern areas that have had significant past habitat loss and poor weather show the primary Barred Owl effects.

Appendix II -- Management Options

Comparison of methods to control effects of Barred Owls (BDOWs) on Spotted Owls (SPOWs)
BOWG (K. Livezey, P. Phifer, J. Thrailkill, J. Buchanan) and B. Lynn; June 11, 2009

Method	Established techniques?	Economics	Effectiveness at addressing BDOW threat	Ethical considerations
No action				
No Action	NA	No additional costs from current activities if the decision for no action is permanent. Subsequent decisions to take action – whether in the name of SPOWs or other species – may incur greater costs due to lost opportunities to take action sooner.	Almost certain not likely to be effective.	Allows negative effects of BDOWs on SPOWs to continue; no negative effects to BDOWs.
Habitat management				
1. Protect more SPOW habitat	Yes	Presumably very expensive.	Effectiveness in doubt as BDOWs use virtually all areas of habitat used by Spotted Owls	Would provide more habitat for SPOW; whether this will mitigate the BDOW threat is uncertain, as BDOWs use all habitat conditions suitable for SPOWs; there are also social and economic issues to consider (e.g., community livelihoods).
2. Manage habitat to benefit SPOWs over BDOWs	No	Presumably very expensive; requires large-scale management of SPOW habitat; requires unprecedented level of alternative management strategies to investigate the possible forest conditions that would benefit SPOWs	Unknown; however the length of time required to evaluate the response of owls to habitat manipulations – due to the slow rate of tree growth and forest development – suggests that this option is not very practical.	This ideally would provide more effective habitat for SO; the same issues as above apply.
Feeding				

Method	Established techniques?	Economics	Effectiveness at addressing BDOW threat	Ethical considerations
1. Supplementary feeding of SPOWs	Yes, in some regard.	Expensive; requires surveys to locate nesting, floating or dispersing SPOWs and repeat visits to feed SPOWs.	Ineffective; could help adult SPOWs survive and reproduce, but BDOWs would remain and defend their territories from occupation or breeding by SPOWs, so SPOW fecundity and habitat availability would be reduced; methods for such activity not developed; might require assessment of SPOW condition at capture.	Sacrificing of many mice; people would enjoy helping SPOWs in this way; could negatively affect foraging ability of SPOWs (esp. young ones) who become dependent on being fed by people; continual interaction and possible handling of SPOWs
1. Diversionary feeding of BDOWs	Perhaps.	Expensive; requires surveys to locate nesting, floating or dispersing BDOWs and repeat visits to feed them.	Ineffective; not clear that this would work, as BDOW might respond numerically to food augmentation; BDOWs would remain and defend their territories from occupation or breeding by SPOWs, so SPOW fecundity and habitat availability would be reduced.	Sacrificing of mice; may exacerbate problem with SPOWs if BDOWs respond numerically.
Disruption of BDOW reproduction				
1. Oiling of eggs	Conceptually, yes; there are limitations, however.	Expensive; would require surveys to find BDOW nests and access (via repeat visits) to nests when eggs are present (impossible for many cavity nests); would require use of tree climbers.	Ineffective; BDOWs would either remain and defend their territories from occupation or breeding by SPOWs or would vacate (due to disturbance) and possibly affect other SPOWs	Killing of eggs; disturbance to adult BDOWs
2. Removal of eggs or nestlings	As above.	As above.	As above; removal of eggs could lead to additional nesting attempt.	Killing or hatching of eggs; if eggs are hatched, would require keeping BDOWs in facilities or translocating them; disturbance to adult BDOWs
3. Sterilization of adults	????	Expensive; requires capture of BDOWs and costs of treatments; ongoing.	As above; trials with other species indicated temporary effectiveness; technique not developed for this species.	Stress to captured BDOWs; deprivation of sterilized BDOWs the opportunity to raise young;
4. Noise disturbance	Perhaps	Expensive; repeat visits may be required to sufficiently disturb owls such that they abandon nesting attempt at site.	Not certain that disturbance would disrupt breeding; territorial BDOWs would remain in area.	Repeated disturbance of BDOWs; possible disturbance of nearby SPOWs and other species.
Translocation				

Method	Established techniques?	Economics	Effectiveness at addressing BDOW threat	Ethical considerations
Translocation of BDOWs	Yes	Very expensive; requires locating BDOWs, attracting them to trap (on-site time needed to capture each BDOW is variable); translocation by vehicle and plane to area well outside of SPOW range; care / maintenance and veterinary inspection of owls prior to actual translocation; coordination with biologists in area of translocation, and costs associated with post-release assessments (e.g. radio-tracking).	Effective; directly addresses issue of competition; likely less efficient than removal, but it possibly of similar effectiveness (the net result is potentially similar).	Stress and possible injury to captured/ translocated BDOWs; difficulty of translocated BDOWs to find food and territories in new areas; competition with resident BDOWs in translocated area; possible genetic effects to resident BDOWs if relocated in areas of different subspecies
Lethal removal				
Lethal removal (shooting) of BDOWs	Yes	Least expensive of all options; requires locating and removing adult BDOWs.	See translocation (e.g. more efficient but effectiveness may be similar).	Death of many individual BDOWs; potential regional effects to BDOW community.

Appendix III -- Protocol Elements

Considerations in conducting lethal removal of barred owls
Developed by the Barred Owl Work Group
May 28, 2009

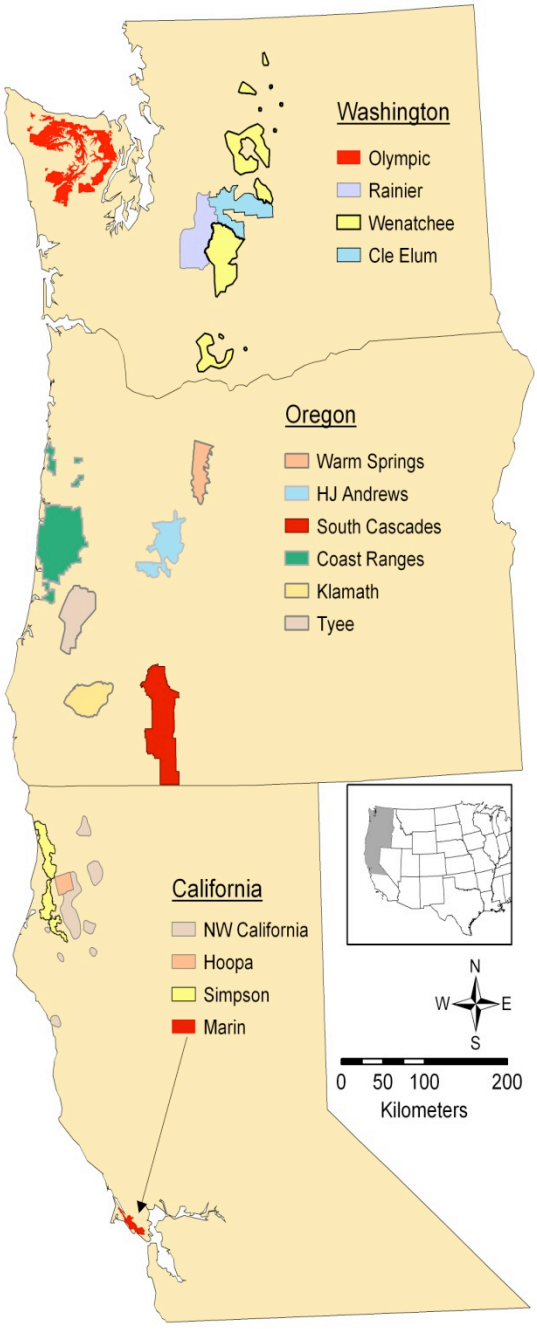
- Conduct removal during the early breeding period, to just before hatching (use the protocol dates to inform this date).
- Juvenile removal will occur only after juveniles are fully independent of adults.
- Removal can also occur by waiting until late summer or fall and take all birds that can respond to territorial call. By waiting to this time will help eliminate behavioral avoidance of surveyors.
- Post fledgling period (after September 1) (use protocol dates) to earliest date when eggs have hatched provides high level of confidence that dependent young will not be orphaned.
- Shotgun should be used and not a rifle, with a night-vision scope for night work. Gun of choice is 20 gauge, #6 shot, full choke. Shot pattern should be tested for effectiveness.
- Owl needs to be perched, not flying, unobstructed sight, for removal.
- Positive visual identification needs to occur; vocal identification if necessary.
- Researchers need to identify appropriate preservation techniques for studies of carcasses.
- It is desirable to give Cal Academy first choice of carcasses, as they have demonstrated need for such material. However, identification of other venues for scientific purposes will be investigated (museums, universities, etc).
- Field staff doing removal should contact local law enforcement prior to work to avoid public concerns over night discharge of firearms and avoid inadvertent LE notifications.
- Training of personnel involved in removal will occur. The training will cover weapons familiars, along with the ethical, logistical, and safety considerations of conducting removal.

Locations for Potential Experimental Removal of Barred Owls

The following northern spotted owl demographic study areas are being considered for experimental removal of barred owls: Olympic, Cle Elum, Coast Ranges, Klamath and South Cascades.

From statistical analyses conducted to date, the Barred Owl Work Group is advising that the Coast Ranges, Klamath and Cle Elum areas, together, be experimental removal areas because these areas include three different provinces and varied densities of barred owls. This combination of factors will provide a better scope of inference in the results.

Additional consideration is also being given to locating experimental removal on the spotted owl – barred owl interactions study area. This area is just east of the Coast Ranges study area in Oregon.


Washington
Olympic
Rainier
Wenatchee
Cle Elum
Oregon
Warm Springs
HJ Andrews
South Cascades
Coast Ranges
Klamath
Tyee
California
NW California
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Appendix IV -- General Summary of Ethical Concepts Relating to Barred Owls

Barred Owl Stakeholder Group
Eugene, OR

June 17-18, 2009

Conceptual Tool	Meaning
Ethics	How we ought to live with others, human and non-human.
Well-being and Flourishing	Ethics seeks the well-being of individuals and the flourishing of communities. This may include people and animals, society and nature.
Ethical Language	When we hear "ought" language, this is an indication that moral concerns are at stake. Examples include terms like justice, rights, duties, responsibility, culpability, good and bad, moral and immoral, etc.
Values	What is of value to us.
Moral values	What is of value in ethical thinking. For example – sentience, sapience, ecological values, social values
Sentience	Awareness, the capacity to feel and experience. Usually associated with the ability to feel pain, pleasure, satisfaction of wants, etc.
Sapience	Self-awareness; awareness of self and others. Also the capacity to make decisions. To be active not reactive. A prerequisite for a creature to exercise "agency".
Moral Agents	Moral agents are creatures like ourselves who are capable of making moral choices.
Moral Wards	Creatures that do not make moral choices (e.g owls), but may still be members of a moral community.
Intrinsic value	Sometimes "inherent value". Other people, animals or nature hold value in and of themselves, and are not simply means to someone's ends.
Extrinsic value	Often "instrumental value". Other people, animals or nature lack value in and of themselves, and are a means to someone's ends.
Co-Value	Concurrent moral values. The co-mingling of intrinsic and extrinsic value. The idea that people, animals and nature may be appreciated for both their intrinsic and extrinsic values.
Moral Community	All those people, animals and nature who because of their intrinsic or co-value, have moral standing and significance in our ethical and political reasoning. This includes policy and management as an outcome of that reasoning.
Sad Goods	An application of co-value. Deer and wolves may both have intrinsic value. Still, predation is a natural, ecological value and the death of the deer at the jaws of the wolf is a sad good. Sad for the deer. Good for the wolf and the ecological community.
Value paradigms	Families of moral value orientations to people, animals and nature.
Anthropocentrism	A value paradigm where moral value is centered in human beings alone. All other animals and nature only have instrumental value to human beings.

Conceptual Tool	Meaning
Biocentrism	A value paradigm where moral value is centered in individual creatures. Ecological communities and abiotic life process only have instrumental value to those individual creatures.
Ecocentrism	A value paradigm where moral value is centered in communities. Individual people and animals only have instrumental value to the broader social or natural community.
Geocentrism	A value paradigm where moral value is centered in people, animals and nature. In addition, this value is scaled from individuals to communities (social or natural). Co-value is always assumed in this value paradigm.
Policy Baselines	Ethical, ecological and social values form the baseline by which to judge the quality of a policy or management practice.
Principles and Maxims	Principles are moral guidelines for our thinking; maxims are moral guidelines for our actions. The two are closely related, but differ in terms of their scale and concrete application.
Principle of Equal Consideration	The well-being and flourishing of all members of the moral community ought to be given equal consideration.
Principle of Hard Cases	When faced with a situation pitting one animal against another (human or non-human), first solve the underlying problem, then look for alternatives, and as a last resort, chose a geographic compromise that protects the entire community's well-being.
Principle of Culpability	"We broke it, we ought to fix it". Often applied to questions of anthropogenic damage to the natural world. For example, humans facilitated the migration of Barred Owls to the Pacific Northwest. We therefore ought to act in defense of Spotted Owls.
Principle of Responsibility	"We may not have broken it, but still, we ought to fix it". Often applied to questions of non-anthropogenic change in the natural world. For example, the migration Barred Owls may be natural, but since other important ethical, ecological or social values are at stake, we still ought to act in defense of Spotted Owls.
Principle of Non-interference	We ought not interfere with natural changes in ecological communities. For example, the migration of Barred Owl may be natural, and while sad in some respects, the rearrangement of the owl species of the Pacific Northwest should not be interrupted.
Principle of Precaution	"First do no Harm". "Look before you leap". The precautionary principle is an awkward translation of the German word *vorsorgeprinzip* or the *principle of forcaring*. Amongst other things, it references proactive procedures to forestall unnecessary harm, and the search for alternatives that produce the best outcomes.
Maxim of Harms and Benefit	The possible harm done through an experiment or management practice should not exceed the potential good it tries to achieve.
Maxim of Integrity	In experiments and management practice, we should endeavour to respect the psychological, physical and social integrity of animals by minimizing stress, using non-invasive and non-lethal techniques when possible, and avoid the disruption of social organization and ecological relationships.

Conceptual Tool	Meaning
Maxim of Reduction, Refinement, Replacement (the 3Rs)	When using invasive or harmful procedures in the laboratory or the field, we should practice the three Rs --reduction of their number of actions, refinements in their technique, and replacement with non-invasive and non-harmful procedures.
Maxim of End-Points	Invasive or harmful actions should specify end-points so that if an action does more harm than good, we know when to stop. After the action is brought to a halt, the situation should be reassessed to produce a better course of action.

Note: Throughout our discussions the stakeholders unknowingly recovered or recreated many of the moral insights used by ethicists to interpret problems of human-animal relations. My role was akin to the midwife and gadfly of Socrates -- first prodding moral reflection into being, and then helping the stakeholders sharpen and apply their newfound ethical tools. I think this was as empowering for the stakeholders as it was gratifying for me.

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