

CHAPTER 13

BETWEEN SCIENCE AND ETHICS: WHAT SCIENCE AND THE SCIENTIFIC METHOD CAN AND CANNOT CONTRIBUTE TO CONSERVATION AND SUSTAINABILITY

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When David Lavigne first asked that I write this chapter, it was on the heels of a presentation on the ethics of wolf recovery. I have been arguing for years that wolf recovery has little to do with conservation science – the natural and applied sciences contributing to conservation.¹ This form of science and its search for causal knowledge is supposed to be the bedrock of environmental and wildlife policy (e.g. policy principles, laws, regulations, implementation, management and evaluation). I firmly believe that conservation science is necessary for the protection and recovery of wolves in particular, and for the protection of biodiversity more generally. Even so, to expect science to resolve what is at heart a moral conflict is to ask too much of one area of human learning. Conservation science can help inform us about the choices and consequences of our actions. It can even give us insight into what actions produce better or worse outcomes in the world, and these insights may help form better policy. But it cannot resolve for us the deeply rooted ethical conflicts over whether and how we should share the landscape with large carnivores like wolves, with a diverse array of life forms, or with manifestly different ways of life. To answer these questions, we require ethics.²

David's charge to me was straightforward. He asked that I answer the following question: "What is it that conservation science and its method can and cannot contribute to wildlife conservation and ecological sustainability? Oh, and please note the place of ethics in this framework". Deceptively straightforward. With this charge in mind, I want to articulate the following argument.

There is no doubt that the world is facing a biodiversity crisis.³ Responding to this crisis poses a challenge for wildlife conservation and ecological sustainability. The customary response is to emphasize conservation science as the evidenced-based, theory-rich baseline for managing biodiversity, from which research agendas, education and policy follow. Without at all diminishing the importance of conservation science, this response invokes an overly simple understanding of science and the scientific method. Scientific reasoning and evidence does help distinguish better from worse causal explanations. Even so, scientific knowledge is always contingent, and laden with values, worldviews, and vested interests.

Moreover, science alone cannot speak to the origin of the "diversity crisis", a dual crisis impoverishing both humanity and nature. Instead, the origin lies in a deeply rooted cultural conflict over our coexistence with other forms and ways of life. Human land-use and wildlife management has direct consequences for the well-being of all human and non-human life. So too our motivations for learning to live in a more than human world is deeply informed by our moral sensibilities and cultural worldviews. Finally, science and ethics are indispensable to one another.

To answer questions of wildlife conservation and ecological sustainability, we must look between ethics and science. Neither one nor the other alone, nor one above the other, is sufficient to the task, as each has different strengths. Ethics provides insight into the "moral causation" of the diversity crisis, and a vision of a world that respects the diversity of life. Science provides insights into

what nature is, how it works, as well as our anthropogenic effects on the geosphere. Like landmarks used during route-finding, both ethics and science help us adjust our compass of environmental and social policy.

I want to make clear at the outset that I am not a conservation scientist, and I will not presume to tell others how to practice natural or applied science *per se*. Doing so violates my deeply held commitment to honouring the insights and skills of colleagues from diverse fields of study. Rather, as someone trained in ethics and the interdisciplinary science of geography, my purpose is to help clarify those elements in the overlapping domains of ethics and science. I also want to make clear that I do not pretend to have the final answer. Science and ethics are contested terrain. My articulations of each will not satisfy every critic.⁴ Rather I want to offer a set of comments on how we might think about conservation science and ethics. I mean these comments to be suggestive, not conclusive, and hope they may serve as a point of departure in future discussions.

THE DIVERSITY CRISIS

As Gary Snyder notes, our world is a vast system of flowing energy and cyclic matter, in his poetic vision, a “breathing planet” nested in “sparkling whorls of living light.”⁵ One of the signature elements of our world is its diversity. Our planet is alive with diverse forms of life and ways of living, human and non-human alike. This diversity is multiform: people,⁶ animals, plants, individuals, packs, tribes, populations, societies, ecosystems and cultures (to name but a few). And this diversity is found in a wide variety of places – in the sea, on land, deep underground, and in the air – each interacting with the other at varied scales, from the micro to the macro, from local to regional to global.⁷

Tragically, we also live in a world facing a biodiversity crisis of global proportions. Modern human activity is accelerating the loss of species and ecosystems at a rate and scale unparalleled in natural or human history. With species already disappearing at many times the rate of natural extinction, up to a quarter of the world’s land animals and plants may be extinct or endangered by 2050.⁸ Conservation scientists have generated a substantial stock of knowledge regarding the factors diminishing biodiversity. The causes of this crisis include habitat degradation, landscape fragmentation, urban sprawl, human population growth, increasing consumption and pollution, and over-exploitation of resources. All of these causes are further complicated by the shifting context of global climate change.⁹

Less understood are the normative¹⁰ values at stake – how humanity should value biodiversity, and how such values should inform our response to the crisis of extinc-

tion. Together, these constitute the non-instrumental¹¹ and normative dimension of biodiversity. Some of these values are about nature itself. One hotly contested issue is whether non-human life is simply a resource for human use, or has a significant value of its own. Another issue is whether our concern for biodiversity should encompass more than wild flora and fauna, and include domestic plants and animals. Other values are about culture and the human interaction with nature. For instance, the cultural diversity of humanity makes cross-cultural norms for ethical decision-making difficult to formulate. Moreover, we have pressing needs to alleviate poverty, advance social justice and defend human rights. These and other particularly human values raise difficult issues about the different range of responsibilities of the world’s peoples for protecting biodiversity. Altogether, questions about these broader natural and cultural values go to the heart of “how we ought to live” with non-human life, and how both human communities and the natural world can and ought to flourish together.¹²

What this means is that we are in the midst of a *diversity crisis*. The diversity crisis is really two interrelated crises – a crisis of nature and a crisis of culture. The crisis of nature is driven by humanity’s “geographic agency”, our power to do good or ill to the living systems of the planet. The effects of this agency are the proximate cause of nature’s decline. Using the theories and methods of science, we can hope to measure and model these impacts, gain a measure of prediction and control over them, and thereby alleviate or reverse some of their most deleterious effects. It is for this reason we place a legitimate measure of hope and faith in scientific-technical approaches to wildlife conservation and ecological sustainability.

Unfortunately, our cultural crisis is a bit harder to comprehend. At its heart is a clash of ethics-laden worldviews. These worldviews describe visions of the good life, definitions of moral community, norms of conduct, and attributions of culpability. How we understand and respond to the natural world, not the physical consequences of our actions, is the focus of analysis here.¹³ This distinction is crucial. It is our worldviews and ethical sensibilities that not only inform human agency, but characterize the ultimate causes of the diversity crisis. And because the cultural crisis is so morally and socially complex, it spawns ramifications that complicate its resolution. Examples abound. The diversity crisis:

- threatens the cultural survival of the worlds Totemic Peoples whose modes of thought and livelihoods are rooted in the indigenous animals and resources of a region,
- creates a demographic trap whose cycle of spiraling population growth, increasing poverty and degrading habitats besets the so-called developing world, and

- exacerbates the kind of globalization that facilitates irresponsible consumption, the centralization of political-economic power, and the shifting of environmental burdens from areas of wealth to areas of poverty.

Whether humans are a part of the natural world, while at the same time, distinct enough as a species to take moral responsibility for their actions, is the pivotal problem on whose resolution rests any possibility for sustainability. And this has occasioned a global debate over the ecological, social and ethical values that ought to inform our thoughts and practices regarding animal welfare, wildlife conservation and ecological sustainability.¹⁴

SCIENCE AS THE CUSTOMARY RESPONSE

The customary response to this challenge is to emphasize conservation science, demand science-based environmental policies, and redouble efforts at research and education. This response is conditioned by three presuppositions. First, science provides an objective knowledge of nature, and of our human interactions with nature. Second, this knowledge should be the basis for public policy. Third, education in the methods and facts of science will produce the political and social paradigm shift to motivate and guide a sustainable relationship with the Earth. Thus conservation science becomes the evidenced-based, theory-rich baseline for managing biodiversity in wild and humanized landscapes, from which research agendas, education and policy follow.¹⁵

Given the interconnected ecological, social and ethical dimensions of the diversity crisis, it may seem incongruous to rely primarily on conservation science as the solution to our problem. Yet the reasoning is simple enough. Ours is a world of facts, and science is best suited to explore, describe and explain these facts. Conservation science therefore provides the data and analyses that inform the purpose and outcome of public policy as it relates to wildlife conservation and ecological sustainability.

In this mindset, the natural sciences tell us the truth about nature, while the social and interdisciplinary sciences model the human interaction with natural systems. If through scientific inquiry we can correctly model the causal interactions within nature, as well as between nature and humanity, then we will be able predict human and natural events, identify and forecast trends, mitigate undesirable outcomes, and manage for certain goals, such as ecological sustainability. This is well expressed in various formulations of the widely adopted “ecosystems management” approach to natural resources. Ecosystems management uses both the natural and social sciences to establish baselines for biodiversity and ecosystems integrity,¹⁶

assess the social and economic needs of a given community or society, and manage the landscape (or seascape) in accordance with desirable social outcomes. Conservation science is a success if it contributes to outcomes that are ecologically sustainable and democratic.¹⁷

LIMITS OF SCIENCE

Without at all diminishing the importance of conservation science, the customary response invokes an overly simple understanding of science and the scientific method, ignores our historical and philosophical knowledge about science and society, and fails to grasp the tight connection between science and ethics.

Science is not a means for obtaining certain and predictive knowledge about our world, and the hope for a unitary method or conciliant theory is a caricature and pipe-dream respectively. Science is rather a set of theories and methods for seeking causal explanation of natural and/or human phenomena. These theories and methods necessarily differ with respect to the phenomena at hand, and modeling all the sciences on a single model (such as the experimental method) has proved illusory. We can certainly distinguish better from worse causal explanations on the basis of reason and evidence. Even so, scientific knowledge is always contingent, value-laden, informed by larger worldviews, and beholden to systems of power.¹⁸

Why is this the case?

Modern science was founded on the belief in an orderly universe. Matter and energy conformed to rules that could be measured and modeled. Armed with knowledge of these “laws of nature”, scientists could peer into the determinative nature of reality, predict events and control outcomes. Like its ancient and medieval counterparts, science concerned itself with finding causal explanations for the world’s phenomena. It differed, however, in its worldview of the universe, and thus the kinds of theories and methods that were needed to produce causal explanations. It no longer focused on an admixture of explanations rooted in theology, human agency, proximate causes and natural processes (the “four causes” of Aristotle), but set its sight squarely on what its precursors labeled “material causation”, that is, explanations for natural and social events rooted in the material world. The forces and effects that early modern science both looked for were found in the physical world. Correspondingly, the fields of investigation they praised most were physics, mechanics, optics and chemistry.¹⁹

At first this worldview was applied to animals and the rest of nature, but not to humankind. Because most scientists of the time believed in a supernatural power (God) that had created an orderly universe (the concept of deism), they also believed that God had invested

humankind with a soul. Because they were given souls, humans had “free will” and were exempt from the determinism of natural law. This was especially true of educated white men who most closely resembled the mien of the deity. Very quickly, however, the same concepts of order, determinism, predictivism, measurement, modeling and control were applied to human beings and their societies. Thus the natural and moral philosophy of medieval and early modern Europe was transformed into the natural sciences (e.g. physical, biological), the social sciences (e.g. behavioural, psychological), and the humanities (e.g. history, philosophy) of today. The ultimate goal was the determinative prediction of all natural and human phenomena, a grand theory of nature and society that E. O. Wilson well describes as consilience, or “the unity of knowledge”.²⁰

Accompanying this faith in consilient theory is a distinctive approach to the method of inquiry. Because it allowed for controlled tests in closed systems that could, with precision, describe chemical and mechanical cause and effect, the “experimental method” became the model for scientific investigation. As our knowledge of the world grows more nuanced, from subatomic particles to complex and chaotic systems – this method is supplemented by others – field trials, statistical techniques, mathematical modeling, etc. Even so, the double blind, controlled experiment remains the touch-stone of scientific methodology to many researchers. It is this basic worldview of science and its method that we teach to schoolchildren, that knocks around inside graduate students heads, and forms the public impression of science. In the philosophy of science we call this the *naturalistic model* of the sciences.²¹

Of course, when we explore the history and philosophy of the natural and human sciences, we quickly learn this worldview is false. It is not false because it is wrong *per se*, but because it conveys only a partial notion of causation. To be fair, the naturalistic model has vastly extended our knowledge of the physical and biological world. It sparked and sustains a technological revolution of unparalleled proportions. It works well at explaining what it was designed to explain – tangible phenomena in relatively closed systems, things we can touch and measure whose causal interactions are bounded and knowable. When scientists say they study facts and produce objective knowledge about the world, they are usually speak from the perspective of the naturalistic model of science.²²

Yet we live in a world of values as well, which requires an interpretive model of science, one designed to investigate the cultural and social worlds of human and many non-human animals. Values are also facts of life, but they are intangible phenomena that elude capture through quantitative methods. Alongside values, the world of intangible phenomena is large, and includes feelings,

thoughts, intentions, reasons and culture (to name a few). These phenomena are just as real, but they cannot be measured and modeled in part or whole. They need to be apprehended if we are to understand their meaning. Questions of meaning, intention and the like are thus qualitatively different phenomena, the sort of facts that the naturalistic sciences were never designed to investigate. What this means in practice is that living beings who are sentient and/or sapient, creatures such as cats and cows and wolves and people, do not completely fit into the theories and methods of the naturalistic model. You cannot describe or explain what people and many animals do, without causal reference to the agency that motivates their behaviour. This is as true with respect to the hunting styles and skills of wolf packs, as it is of the collective decisions of democracies over its economic policy. To study human and animal agency,²³ we require distinctive theories and methods appropriate to the investigation of these phenomena. The development of moral-social theories, cognitive ethology and qualitative methods reflect this distinction between the naturalistic and interpretive models of science.²⁴

Most of conservation science is beholden to the naturalistic model, and therein lays its limits. Clear-sighted as it can be when quantifying the functions of ecosystems, its vision is progressively foggy as it passes through animal sociality and on to human agency. Recognizing the limits of conservation science does not imply it is flawed or unimportant. Conservation science is crucial to our efforts at protecting and restoring wildlife, as well as creating greater well-being for people, animals and nature.²⁵ Even so, the natural sciences cannot on their own circumnavigate the entire landscape of our concerns for diversity.

FACTS AND VALUES

When we discuss questions of facts and values, we quickly run up against the *fact/value dichotomy*. This dichotomy is ingrained in the naturalistic model discussed above, and serves as the justification for making the natural sciences the gold standard of causal explanation. In this dichotomy the natural sciences are associated with facts, reason, empirical truth and objective modes of analysis. The humanities are associated with values, emotions, personal and social preferences, and subjective modes of experience. Science is believed to produce an objective knowledge of the world, while the humanities create subjective states of experience.²⁶ For some the causal insights of science are so unique, it becomes the only form of true knowledge, a position known as scientism. This scheme marginalizes “non-scientific” modes in knowledge, while valourizing “scientific truth”. Sadly, to the degree that we take this dichotomy to heart, we impoverish our understanding of the world in general and our scientific

understanding of causation in particular. There are several aspects of this dichotomy we might explore, e.g. its historical development, the logic of the “naturalistic fallacy”, and its implications for ontology and epistemology (philosophy of science terms for theories of knowledge and existence, respectively).²⁷

Here I want to focus on the most common claim associated with the fact/value dichotomy, the position that science is (or should be) value-free and value-neutral. The reasoning for this runs as follows. Science provides an unbiased outlook on the world, and the scientific method ensures the objectivity of scientific knowledge. Science is therefore free of value claims in itself and neutral with respect to differences over values. In this respect science is like a “tool”, neither good nor bad. It simply provides information. Science may therefore inform the policy process of possible options and likely outcomes, but it cannot choose for us the values we should believe in, much less act upon. In this sense, a science free of values may still be relevant to the public good.²⁸

There is something salutary here, especially if we consider objectivity as a commitment to honesty in research. It is even better if we take a broad view of scientific methods, seeing them as systematic practices using reason and evidence in a progressive process of learning. Considered so, objectivity and method can help us expose invidious bias, and avoid errors of fact and interpretation. Based on conversations I have had with scientists, I think this is what most of them really mean when they strive for an “impartial” point of view. And to preserve the appearance and substance of impartiality, many (but not all) avoid taking politically sensitive positions on issues of animal welfare, social justice and environmental protection.

Pushing the notion of objectivity farther, to claim that science is free of values, or that scientists should be neutral with respect to the uses and consequences of science, is to go too far. Science is never value-free and, for better or worse, is laden with value implications. The reason is that a host of moral sensibilities are embedded within the intentions, actions and/or consequences of science.

Scientists are people after all, and their research is unavoidably inflected with values. Many of these values have obvious ethical overtones. We learned to our shame of the scientific abuse of human research subjects through the Nuremberg trials (re: Nazi racism and science) and the Tuskegee experiments (re: American racism and science). We are coming to grips with similar issues involving animal subjects research as well. In addition, science depends on its practitioners telling the truth about their findings, and trusting in the good will of other scientists. Understanding and acting on these values in the form of ethically informed best practices is crucial to maintaining the integrity and credibility of science. Further, science can help us discriminate between better and worse ways of

valuing the world. A case in point is the growing recognition that many animals are not automatons, but individuals nested in social groups (e.g. wolves and house cats). This has transformed our beliefs about what responsibilities we have to other animals, whether at home, in the laboratory, in the farm yard, or in the wild.²⁹

Science therefore operates in two value-laden *domains of significance*. Both domains are crucial to the integrity and credibility of conservation science. The first is the internal domain, that is, the methods of research and the production of scientific knowledge. We often hear this domain referred to in terms of “professional ethics” or “codes of conduct”. Ethics in the internal domain helps ensure the integrity of research. While there are many ways of defining this integrity, it basically serves to uphold two core moral values of science – truth and trust. When speaking of truth, we are referring to such matters as the collection, analysis, interpretation and communication of research. With respect to trust, we are thinking primarily about academic freedom, honesty, transparency, collegiality and conflicts of interest. Along with upholding truth and trust as core values, ethics also helps us 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.³⁰

The second is the external domain, referring to the uses of scientific knowledge, and the applications of its theories, methods and associated technologies. We often hear this domain referred to in terms of “animal welfare” or “environmental ethics”. The reason for this external domain 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. Ethics helps elucidate the best uses of science by noting how the research practices and knowledge products of science produce more or less well-being in the world.³¹

If we can let go of the fact/value dichotomy and its self-privileging of the naturalistic model in science, then another point swims back into focus: the welfare of animals, the conservation of wildlife, and the integrity of nature are not only, or primarily about, science. The ongoing debate in the United States and elsewhere over the disposition of wildlife in terrestrial and aquatic military zones is a case in point. It raises value-laden questions about our compassion for sentient animals, our commitment to preserving species diversity and the integrity of ecosystems, and our legitimate concerns for national secu-

riety. The work of scientists will help us determine some of the consequences of military activity on endangered and threatened species, as well as their critical habitats. We could connect this example of value-laden environmental questions into many other areas of wildlife management and landscape protection. Nonetheless, science cannot answer how we ought to balance the well-being of people, animals and nature in a world beset by human violence. Rather it is the ethics-laden discourses of morality, religion, politics, spirituality and the like that generate the moral insights to make discriminating judgments about how we ought to live.³²

PRACTICAL ETHICS

Up to this point, I have outlined a set of insights and limitation to conservation science. I hope it is now clear why science alone cannot adjudicate (as in justify and choose between) the cultural norms and socio-political structures that generate a constructive or destructive relationship with nature. Having sorted out some of the confusions introduced by the fact/value dichotomy, we are now in a better position to apprehend that ours is a world of both facts and values. To understand and improve our world, the facts of science are never enough. Facts must be complemented by values. Or to put it another way, values are an indispensable kind of intangible fact, much like the tangible facts of the global water and carbon cycles, or trophic energy flows. Both are empirical.

Allow me to caution that adding values to facts does not require changing the way science is done. We gain nothing by side-tracking scientists from what they do well. Even so, conservationists will benefit from a robust ethical analysis that ponders the values that motivate and impact their work. A particularly useful framing of value questions is achieved through ethics. Ethics is not the only way to explore the normative aspects of our relationship to people, animals and nature. Nevertheless, it is an indispensable tool for exploring the meaning and significance of those values that serve the well-being of the human and natural world. Ethics is adept at understanding and adjudicating (i.e. describing, explaining, justifying, choosing) the normative dimensions of human life.

Ethics can be a subject that is difficult to discuss, raising fears that it imposes a rigid or ideological view of the world. There are people who use ethics to shame others, or score debating points. There are also people who justify their dogmatic approach to life with a veneer of ethics. But this is not the main tradition of ethics, or the kind of ethics I am recommending here.

At its best, ethics is an exploration of "how we ought to live".³³ It is a conversation about the moral values that ought to inform our way of life. This search for the moral

values we ought to live by involves a twin-fold process of critique and vision. We criticize what detracts from the well-being of ourselves and others, and we envision how we might improve our lives by proactively pressing for positive change. Ethics may be informed and enriched by religion, spirituality, personal experience or social custom, but it is not reducible to these sources. Instead, ethics is a cross-cultural and cross-disciplinary dialogue that uses reason and evidence while discriminating between moral values. Put into practice, ethics helps develop moral principles to guide our thought and action, and improve the well-being of ourselves and others. These others can include different entities (human or non-human) considered at different scales (individuals, social groups, systems). Thus ethics may concern itself with the well-being of individual people and animals, communities, populations and species, as well as cultural, social and ecological systems.³⁴

Ethics is also a form of discursive power. Ethics has the power to reveal moral concerns, guide our thought and action in addressing moral problems, and hold people accountable for their (un)ethical actions (irrespective of legalities). Moral critique is the foundation for all movements of social change, whether these are for animal, environmental or social causes. It is for this reason that ethics is indispensable in political life (broadly understood). Moral norms are the foundation of our social customs and laws. This is not to say these norms are always or mostly right. We need only to look at the transformation of norms regarding race, gender and sexual identity for examples of moral progress. Even so, ethics-based arguments motivate the struggle to change and evolve customs and laws. If the process seems a bit unclear, think of it as akin to the development of law. There is much wrangling and many errors, but over time, a trend emerges towards better and deeper understandings. Reason and evidence can do much to contest custom and prejudice. And while there are no external, God-given, *a priori* moral truths to set our sights upon, we can adjust our moral compass to distinguish better from worse ideas and practices based on how they improve or detract from human and non-human well-being.³⁵

How then should ethics inform the activities of conservationists? What constitutes a practical ethics for science in the service of wildlife conservation and ecological sustainability? What moral understandings should we consider as we advocate for animal welfare in wild and humanized landscapes? There are several directions we might take to answer this. For the purpose of this chapter, I will focus on the core question of animals and their *moral value*. An analogy may help set the stage for this topic. The moral value of human beings motivates our protection of human subjects in scientific research and

civic life. So too, the moral value of animals is motivating our ethical concerns for wildlife conservation and ecological sustainability.

Any practical ethics for conservation must recognize the moral value of animals. While controversial and frequently avoided as a topic of dialogue, one cannot sidestep this issue. Doing so simply undermines the rigour and credibility of one's efforts to inform science with ethics. Discussing the moral value of people, animals and nature can be difficult. It raises a suite of philosophical, religious and social issues that many activists and scientists are uncomfortable discussing. We therefore tend to shy away from the issue completely, or we speak about "social attitudes" with a posture of non-committal objectivity. Being objective as a way to avoid invidious bias in scientific research is a good. Objectivity as an excuse to marginalize value-laden issues in science and society is a mistake. When we misuse objectivity in this way, we simply avoid the root questions that need answering, and this serves conservation poorly.³⁶

The justification for protecting human subjects in North America is human rights and civil liberties, both of which are rooted in the dignity and worth of human beings. In ethics-talk, we say that people have *moral value*, that as feeling and thinking creatures we have a responsibility to treat each other with care and respect. It is for moral reasons that we as a society have instituted research rules and human subjects review committees to ensure informed consent, psychological and physical integrity, and justice for vulnerable populations. When it comes to animals we are not so well agreed as a society. The range of species and their differences makes it impossible to simply map human ethics onto animals. Still, virtually all informed ethicists would say that many animals, including most mammals and birds (to name but two evolutionary lineages) are to varying degrees feeling and thinking creatures. Because of their sentience (awareness) and sapience (self-awareness), these creatures have what ethicists call *moral standing*: their moral value demands our attention, consideration and inclusion in a more-than-human moral community. There is broad agreement here based on the facts of biology, ethological studies, and analogies to human welfare.³⁷

Please note that neither moral value or moral standing should be equated with "animal rights" *per se*. Animal rights is a broad term, most used to describe an advocacy position, or a philosophical doctrine. Associated with groups like People for the Ethical Treatment of Animals (PETA) and the philosopher Tom Regan, animal rights makes a powerful argument for the recognition of moral rights for sentient animals, rights that are akin to human civil and political rights. Yet to the degree that there is overlap between these arguments, it is more along the lines that there are right and wrong (or better versus

worse) ways to treat animals, not an endorsement of particular policies or theories. In addition, also note that the recognition of moral standing does not imply equal treatment between humans and other animals. Moral standing means that being part of a broader moral community, the well-being of animals must be taken into account, not that different individuals or groups need to be treated in exactly the same way.³⁸

The ethics of wolf recovery in North America is a good example. For some, wolves are a biological heritage we ought to restore and conserve for our children, citizenry and the world. Future generations will condemn us for failing to take reasonable steps in this regard. Many see in wolves the hand of a Creator for whom the natural world, including wolves, is good. Humans are thereby the stewards of Creation, and wolf recovery is a sacred obligation. Others believe wolves are more than functional units of ecosystems, more than resources for human use. Rather, wolves are self-aware and social beings. This gives wolves, as it does people, a moral standing when it comes to human actions that, for better or worse, have consequences for individuals, packs, populations and species. In this worldview, wolf restoration is an act of restitution for past harms done to creatures with whom we share a common landscape. For still others, wolves are top predators contributing to the health and well-being of the larger community of life. Wolves generate a kind of "natural good" that, while unintentional on their part, is indispensable to ethical adjudications of how we ought to live with the natural world.³⁹

In addition, there are a series of value paradigms that stake out distinct positions and implications in this debate – anthropocentrism, biocentrism, ecocentrism and geocentrism. Briefly, *anthropocentrism* gives moral standing to humans alone. *Biocentrism* affords moral standing to living beings, especially the more sentient and sapient. *Ecocentrism* is primarily concerned with the web of life than it is the well-being of individual life-forms. To my way of thinking, articulations of these value paradigms have bogged down in unnecessary and unproductive arguments pitting humans against nature, people against animals, and individuals against systems. For my part, I defend a geocentric approach to moral standing. In *geocentrism*, one values people, animals and the rest of nature, both as individuals and/or collectivities when appropriate. While this paradigm does not eliminate conflict of values, it does recognize the reality of multiple values, as well as our ability to balance those values. For instance, we do this when we balance individual civil liberties against questions of public safety and national defense. Balancing moral-political values is a fact of life in every dimension of human activity, and it should not be seen as an insuperable barrier when it comes to questions of animal-human relationships.⁴⁰

Embracing the moral standing of animals has immediate implications, two of which I will note here. First, it highlights the *moral significance* of conservation. The reason for this is obvious. Our actions have real consequences for the well-being of wildlife and the integrity of their habitats. We can do good or ill to the lives and livelihood of people, animals and nature. Because of this, whether intentional or not, our work is laden with moral implications. In our hearts and minds, the vast majority reading this chapter already will know this. Most of us chose this area of work to make a positive difference in the world. We care for human and non-human individuals, communities and systems. While our reasons and experiences may vary, the caring remains, and it is caring that is perhaps the primary source of our moral sensibilities.⁴¹

Second, it highlights the *practicality* of ethics in conservation. It reminds us that the stickiest problems in ecosystem and wildlife management are deeply rooted moral conflicts over whether (or how) to coexist with other forms and ways of life. These problems have little to do with a lack of empirical data, quantitative theories or management techniques. Instead, they are a consequence of differing moral visions of how we ought to live with non-human others. To resolve such conflicts, we have to address their moral roots by directly and respectfully engaging the moral differences that divide us. Resolving these differences may be crucial, but doing so is a long process. Fundamentally, it is a matter of instituting an ongoing community dialogue. The dialogue must respect a diversity of opinions, avoid polarization, and focus on best concepts and practices. It is also a process of struggle and the exercise of political power – mobilizing support, negotiating with opponents, and marshalling the agreement of third parties.⁴² Overall, it is an effort of cultural transformation that needs to be embraced by advocates and scientists alike. Simply bandaging the wound in our relationship with nature will not heal the dysfunctions. If our efforts at wildlife conservation and ecological sustainability are to succeed, we need to look to the long-term “health” of the geosphere.

Finally, there are different styles of ethics, some of which are more helpful to conservationists than others. One approach to ethics has been to create a body of internally consistent and empirically ungrounded hypotheses (e.g. formal ethics, analytical ethics), and then deductively apply these hypotheses to determine the proper moral outcome in the world (e.g. applied ethics). If this sounds vaguely familiar, it should. It is a model of ethics that mimics the naturalistic model of science.⁴³ This model of ethics does contribute to the clarification of concepts and systems of thought. I do not mean to undermine its importance. It is, nonetheless, a poor compass in a complex moral landscape. In an article on dueling moralities over feral horses in Australia, I remind readers that:

Ethics has historically been a form of practical reasoning. Practical reasoning differs markedly from the analytic reasoning that dominates modern moral philosophy (e.g., utilitarianism, deontology, contractarianism). Modern moral philosophers seek a trans-geographical truth, which is to say, deductive axioms of conduct, derived without the benefit of geographic or historical contextualization, and equally applicable to all people, places and circumstances. This not the case, however, for the practical reasoning that is part of alternative traditions of moral philosophy (e.g., casuistry, hermeneutics). Practical reasoning seeks to articulate situationally sensitive principles to guide us in moral and political deliberation. In this view, ethics is not a timeless and placeless code of rules, but the use of moral concepts as rules-of-thumb that help us answer “how we ought to live”.⁴⁴

An ethics founded on practical reasoning is what I call *practical ethics*. Practical ethics resonates with Socrates’ original question of “how we ought to live”. In the contemporary era, this question applies to both humans and non-humans. It focuses on the moral sensibilities that inform (or ought to inform) our individual and collective lives. It seeks to help people make better decisions, incorporating dialogue, democracy and diversity as serious elements in moral deliberation. Taking the failings of analytic and applied ethics to heart, practical ethics looks to diverse moral principles, rooted in the empirical reality of cases, to triangulate on the reasons and resolutions to our moral concerns.⁴⁵

Two insights of practical ethics should be emphasized here. First, ethical concepts cannot be applied by rote, like a grid of latitude and longitude from which we read off the correct “position”. Rather, moral understanding is akin to triangulating on the best of several positions, using a plurality of principles (understood as “rules of thumb”). Second, the ethical principles we use should be selected in light of the case at hand. Obviously this relates to the point above, but it is more than a simple statement of conceptual pluralism. It recognizes the interpretive nature of ethics. Our prior understandings condition our current insights. As our presuppositions change, so do our moral insights. Moral principles actively and dynamically reveal the ethical issues at stake, as well as provide guidance on what we ought to do about them. Thus whalers and scientists might argue interminably over the sustainable yield of whale populations.⁴⁶ And yet, the insight that whales may have moral value and standing cuts through

this debate to reveal fundamental problems in “taking” sapient creatures, especially from their family groups.⁴⁷

The value paradigms mentioned above are also a good case in point. There are times when we may want to take a biocentric point of view, focusing our concern on individual animals and their social groups. This is most useful when the animals in question evince a high degree of sapience. There are other times when we may want to take an ecocentric point of view, shifting the scale of our questions and interpretations to the ecosystems of which individuals are a functional part. Where the creatures in question closely resemble human beings, the arguments for biocentric animal rights carry weight. The great apes fit well in this system of ethics. If the species differs significantly from human beings, the power of biocentric arguments fades. Spiders manifest none of the features that animal rights advocates use to defend primates, and should be thought about in ethically distinct ways. These are not opposing points of view *per se*. They do, however, raise distinct questions and reveal different moral issues.

At the same time, we may wish to take a geocentric point of view when weighing multiple values between different species who share a natural environment. Whales and krill exemplify this point. Using biocentric arguments to defend individual krill against the needs of baleen whales is a concept error in moral understanding. Yet we should still value krill as elements of an ecosystem, an ecocentric insight. Failing to employ biocentric concerns about whales as individuals or social groups is another failure in judgment. Their sapience entitles them to such consideration. Yet we do not want to miss the forest for the trees, valuing whales but not krill. Employing a geocentric paradigm of moral value, we can value both whales and krill, treating them differently in thought and action as is fitting to their distinct natures.

DEEP SUSTAINABILITY

Shortly before the conference that led to this book, *BBC Wildlife* magazine published a cogent article by David Lavigne on wildlife conservation and “wise use”.⁴⁸ In this article, Lavigne argues that the language and agenda of sustainable development has been hijacked by a “wise use” movement that is hostile to wildlife conservation and ecological integrity. Shielded by a façade of eco-newspeak, this discourse appears to protect animals and their environments while pursuing development, even while their policies and practices are abetting the exploitation of wildlife and wildness. This takes a variety of forms, from creating markets for the natural services of the commons, commodifying wildlife and wild landscapes, dismantling national parks and reserves, and privileging human development over the protection of nature.

Some readers may interpret Lavigne’s essay as misanthropic, the perspective of a privileged white Canadian concerned with questions peripheral to the well-being of billions of people from the developing world. For those comfortable with a style of identity politics that accepts or dismisses a perspective based on one’s geographic and social location, this will be enough to end the matter. It is not for me.

There are good reasons for worry about the state of nature under the rubric of sustainable development. The steady degradation of ecological integrity through integrated conservation and development strategies is well established.⁵⁰ Much of the sustainable development literature is openly anthropocentric, privileging humans above nature, and marginalizing concerns about animal welfare and ecological integrity.⁵¹ Academics provide a mantle of respectability through ill-conceived theories about stages of development, political-ecology, or the social construction of nature.⁵² International agencies, transnational corporations and human rights activists further exacerbate this with a myopic focus on the economic, social and technological aspects of human health and welfare.⁵³

This is not to deny or diminish the manifest responsibilities we owe human beings who are near or far, or of this and subsequent generations. Basic human rights, the empowerment of women, ridding the world of hunger, malnutrition and disease, ending poverty and illiteracy, creating infrastructures of hope and opportunity for every person and community – these are positive moral goods that we ought to proactively honour, endorse and support.

Yet there is no ethical need or requirement to marginalize the well-being of animals and the rest of nature, while we meet our human responsibilities. And there is a perverse blunder in demanding we sacrifice what little is left of wildlife and wildness, in the vain hope that this will alleviate the burdens of global inequities. Doing so not only dismisses our legitimate moral concerns for the non-human world, it diminishes the sources and resources of cultural diversity and integrity the world over.⁵⁴

Lavigne is not alone in identifying the mendacity of eco-newspeak.⁵⁵ Rather, he is cautioning against blind faith in practices that may sound good, but hide a sinister agenda. He is not denying our shared responsibilities to the human world. Nevertheless, what is absent from Lavigne’s article, and I mean this in the sense of silence not error, is an articulation of the moral sensibilities that he brings to the table. An ethical framework that will help people understand that his arguments are not misanthropic but geocentric – a positive valuation of people, animals and the rest of nature.

Many people of the world, from all walks and ways of life, have articulated powerful critiques of “sustainable

development”⁵⁶ and “conservation” as it is envisioned or practiced by the world’s elite nations, corporations, social classes or non-governmental organizations. Some of these critiques are motivated by an ethic sensitive to wildlife and wildlands. Those involved in the drafting and dissemination of the Earth Charter are a case in point.

The Charter is “a declaration of fundamental principles for building a just, sustainable and peaceful global society in the 21st Century”.⁵⁷ Drafted in a 10-year cross-cultural conversation of global reach, the Charter articulates an ethically grounded vision for a sustainable global society that protects and defends its citizens and the earth. The foci of this vision are respect and care for the community of life, ecological integrity, social and economic justice, and democracy, nonviolence and peace. The Charter notes that “environmental protections, human rights, equitable human development, and peace are interdependent and indivisible”. The ethical principles of this vision are not meant to be a rule-book or code of conduct (the applied ethics approach), but rules-of-thumb to help civil society, nationalities and international organizations develop best concepts and practices while working towards sustainability (the practical ethics approach).⁵⁸

The genesis of the Charter intersects many other declarations, petitions and social movements committed to environmental protection, social justice and peace. Perhaps the immediate precursor was the report by the World Commission on Environment and Development entitled *Our Common Future*.⁵⁹ Shocked by the pace and scale of environmental degradation and inequitable human development, the members of the Commission saw a need for a new moral paradigm centred on the earth and sustainable development – “human survival and well-being could depend on success in elevating sustainable development to a global ethic”.⁶⁰

The Charter directly challenges mainstream philosophies of sustainable development, redirecting the concepts and language to the goal of “sustainable communities” and a broader norm of “sustainability”. Mainstream discourses of sustainable development emphasized sustaining growth to alleviate poverty. Its commitment to wildlife conservation and ecological integrity could be superficial. The framers of the Charter felt more was needed to properly envision and defend the well-being of humans and nature.⁶¹

In the Charter, sustainability becomes a moral imperative to remove the cultural, social, economic and political causes of injustice and privation, while simultaneously valuing the creatures and resources on which human flourishing depends. The Charter is thus principally concerned with securing ecological integrity and equitable human community, especially in the face of undemocratic and unegalitarian trends in globalization.⁶² As I note elsewhere:

By broadening the largely economic and technocratic notion of sustainable development into the moral-political concept of sustainability, the drafters of the Charter were able to emphasize the ethical dimensions that give meaning and direction to human development and environmental protection...⁶³

In a similar vein, Denis Goulet notes that:

The single greatest threat to nature – menacing, irreversible destruction of its regenerative powers – comes from “development”. This same development is also the major culprit in perpetuating the underdevelopment of hundreds of millions. The task of eliminating degrading underdevelopment imposes itself with the same urgency, as does the task of safeguarding nature.⁶⁴

I heartily agree, and I refuse to accede to a world made right for people, but at the expense of animals and nature. There is no ethical reason or political-economic necessity that this be so.

It is this geocentric valuing of life — human and non-human, individual and collective — that I believe is at the heart of Lavigne’s critique. His anger as a global citizen at eco-newspeak is understandable, especially given its justifications for the swath of destruction our sprawling species cuts through the air, over land and in the seas. More to the point, as a scientist it does not bias his research and writing, it sharpens it. Though implicit, his moral sensitivities intensify his analytic acuity, helping him to espy one cause of the world’s biological impoverishment. And is this not one goal of all science, clarity of causal insight?

How then might we express our multiple commitments to people and animals and nature in the context of development? The Charter’s norm of sustainability points the way. It simultaneously acknowledges the crying human need that must be met, as well as the responsibility to respect and care for the natural world. Because the Charter is a relatively brief document, it cannot cover each and every contingency in which questions of wildlife conservation, ecological integrity and sustainability intersect. Yet as an open-ended document, it is ripe for further specification.⁶⁵

I suggest we begin to talk and act in terms of *deep sustainability*. By deep sustainability, I mean a way of human life that ethically values, equally respects and proactively cares for the biological and cultural diversity of our world. Obviously, I do not mean sustainable devel-

opment in the standard anthropocentric and economic mode, as providing a steady supply of material to this and future generations. Nor do I mean ecological sustainability in the sense that Goulet uses it, as preserving the regenerative powers of nature as a whole. Goulet's ecocentric presuppositions are not wrong; preserving the evolutionary-ecological functions of nature is requisite. But a commitment to ecological sustainability does not go far enough in defending the present abundance and distribution of life, or in explicitly recognizing the moral value of non-human forms of life.

Rather, deep sustainability should be an ethics-laden worldview that makes room in our hearts, minds and landscape for the rich diversity of biological and cultural life. It should articulate a true alternative to mainstream as well as "wise-use" notions of sustainable development. It should take a practical approach towards ethics, and emphasize the role of values in defining and creating sustainability. It should be geocentric, and acknowledge the moral value and standing of wild and domestic animals, as well as wild and humanized landscapes. It should embrace both the naturalistic and interpretive sciences as indispensable sources of causal knowledge. In responding to the diversity crisis, it should defend the well-being of people as assiduously as it does wildlife and habitat, but not at the expense of one over the other. It is this kind of sustainability that should envision a world made right for people, animals and the rest of nature.

Aldo Leopold, one icon of North American conservation, says "there are some who can live without wild things and some who cannot".⁶⁶ Leopold was someone who could not. He required wildlife and wildness in his life. Please note that he was not stating this solely as a matter of personal preference, but in recognition of his common citizenship and moral responsibilities to what he termed the "land community", a moral community embracing people, animals and places. If we want to live with wildlife and wildness, if we mean to meet our responsibilities for animal welfare and ecological integrity, we must make morally informed choices about "how we ought to live". And if we allow conservation science and ethics to inform one another, then we have not only a better prospect of a broad recovery of wildlife and habitats, but the (re)discovery of a deeper and more sustainable relationship between humanity and the natural world.

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NOTES AND SOURCES

- ¹ By conservation science I am referring to the natural and applied sciences in the service of conservation (e.g. ecology, ethology, fisheries and wildlife). As the baseline for developing policies covering wildlife conservation and ecological integrity, conservation science impacts public policy principles, statutory laws, administrative regulations, schemes of implementation, techniques of management, and forms of evaluation. The behavioural and social sciences are represented to a limited degree through the study of "human dimensions" in conservation. Conservation science overlaps with conservation biology and environmental geography, but it emphasizes a larger range of disciplines.
- ² See Lynn, W. S. 2002. *Canis Lupus Cosmopolis: Wolves in a Cosmopolitan Worldview*, *Worldviews* 6 (3), 300-327.
- ³ For more on the biodiversity crisis, see Willison, Chapter 2.
- ⁴ Then again, satisfying every critic is not a concern of mine. I am highly suspicious of assertions of finality in the theory and method of either science or ethics, suspecting that claims to comprehension mask dogmatic assertions. For a recent example of such claims for science, see Wilson, Edward O. 1998. *Cosmogenesis: The Unity of Knowledge*, New York: Alfred A. Knopf. A useful critique of Wilson's vision of cosmogenesis is articulated by Niles Eldredge and Stephen J. Gould in a dual book review in *Civilization* magazine. See Eldredge, Niles, and Steven J. Gould (1998) *Biology Rules*, *Civilization* 5 (Oct/Nov), 86-88.
- ⁵ Snyder, G. 1974. *Mother Earth: Her Whales*. *Turtle Island*, New York: New Directions, p. 49.
- ⁶ For an explanation of how I conceptualize the relationship between people, animals and nature, please see endnote 25.
- ⁷ Kellert, Stephen R. 1996. *The Value of Life: Biological Diversity and Human Society*, Washington, DC: Island Press; Mayr, Ernst. 1982. *The Growth of Biological Thought: Diversity, Evolution, and Inheritance*, Cambridge: Harvard University Press; Mittermeier, Russell A., and Cristina G. Mittermeier. 1997. *Megadiversity: Earth's Biologically Wealthiest Nations*, Mexico City: Cemex; Wilson, E. O. (ed.). 1988. *Biodiversity*. Washington, DC: National Academy Press; Wilson, Edward O. 1992. *The Diversity of Life*, Cambridge: Harvard University Press.
- ⁸ Thomas, Chris. 2004. Extinction Risk from Climate Change, *Nature* 427, 145-148.
- ⁹ Eldredge, Niles. 1998. *Life in the Balance: Humanity and the Biodiversity Crisis*, Princeton: Princeton University Press;

- Meyer, Stephen. 2004. End of the Wild: The Extinction Crisis is Over. We Lost, *Boston Review* (April/May), Available at www.bostonreview.net; Noss, Reed F., and Allen Y. Cooperrider. 1994. *Saving Nature's Legacy: Protecting and Restoring Biodiversity*, Covelo, California: Island Press; Terborgh, John. 1999. *Requiem for Nature*, Washington D.C.: Island Press; Wackernagel, Mathis, and William Rees. 1996. *Our Ecological Footprint: Reducing Human Impact on the Earth*, Gabriola Island, British Columbia: New Society Publishers.
- ¹⁰ Another way of speaking about ethics is through the concept of “norms”, a term that is quite common amongst social scientists. The word norm and its cognates derive from the Latin “*norma*” meaning a carpenter’s square, a pattern, or a rule. In modern English, a norm may be many things — a standard or model, the mean value, the average phenomena, or a social custom. In ethics, a norm is a standard for proper conduct. For more on norms in ethical and social theory, see Habermas, Jurgen. 1998. *Between Facts and Norms: Contributions to a Discourse Theory of Law and Democracy*, Cambridge: MIT Press; Selznick, Philip. 1992. *The Moral Commonwealth: Social Theory and the Promise of Community*, Berkeley: University of California Press.
- ¹¹ Non-instrumental values are often referred to as “intrinsic values” or “inherent worth”, although the concept is more complex than this simple duality reveals. Modern debates over this and related terms stem from Immanuel Kant’s distinction between intrinsic and extrinsic values. For Kant, only God and humans have intrinsic value — value in and of themselves. All other things, from rocks to animals to technology, had extrinsic value, that is, value to humans for some instrumental purpose. Thus in Kant’s formulation, we refrain from torturing the neighbour’s dog because we have duties to respect her property, even if we have no duties to the dog himself. For a detailed discussion of intrinsic, instrumental and other values, consult Rolston, Holmes, III. 1994. *Conserving Natural Value*, New York: Columbia University Press.
- ¹² Engel, J. Ronald, and Joan Gibb Engel (eds.). 1990. *Ethics of Environment and Development: Global Challenge, International Response*. Tucson: University of Arizona Press; Lynn, William S. 2004. Situating the Earth Charter: An Introduction, *Worldviews* 8 (1), 1-15; Rolston, Holmes, III. 1991. Life in Jeopardy on Private Property, in Kohm, Kathryn A. (ed.). *Balancing On the Brink of Extinction: The Endangered Species Act and Lessons for the Future*, Washington, DC: Island Press, 43-61; Rolston, Holmes, III. 1994. *Conserving Natural Value*, New York: Columbia University Press.
- ¹³ Lynn, William S. 2002. Canis Lupus Cosmopolis: Wolves in a Cosmopolitan Worldview, *Worldviews* 6 (3), 300-327; Lynn, William S. 2004. Animals: A More-Than-Human World, in Harrison, Stephan, et al., *Patterned Ground: Entanglements of Nature and Culture*, London: Reaktion Press, 258-260; Sheppard, Eric, and William S. Lynn. 2004. Cities: Imagining Cosmopolis, in Harrison, Stephan, et al., *Patterned Ground: Entanglements of Nature and Culture*, London: Reaktion Press, 52-55.
- ¹⁴ Other troubles of our world intersect with the diversity crisis. A partial listing should include war, ethnic cleansing, genocide, poverty, malnutrition, hunger, racism, sexism, nationalism, corporatism, the neglect of children, and the abuse of companion, farm and research animals. Again, globalization makes these problems increasingly complex, and terrorism — especially the prospect of bioterrorism — adds yet another illness to burden our social and environmental health. See Dower, Nigel. 1999. *World Ethics: The New Agenda*, Edinburgh: Edinburgh University Press; Harvey, David. 1997. *Justice, Nature and the Geography of Difference*, Cambridge: Blackwell; Harvey, David. 2001. *Spaces of Hope*, Baltimore: Johns Hopkins University Press; Jones, Charles. 1999. *Global Justice: Defending Cosmopolitanism*, New York: Oxford University Press; Lynn, William S. 2003. Act of Ethics: Ethics and Global Activism, *Ethics, Place and Environment* 6 (1), 43-45; Porter, Philip W., and Eric S. Sheppard. 1998. *A World of Difference: Society, Nature, Development*, New York: Guilford Press.
- ¹⁵ Chicago Wilderness. 2000. *Biodiversity Recovery Plan*, Chicago: Chicago Wilderness. Available at www.chiwild.org/biodiversity.html; Orr, David. 1992. *Ecological Literacy*: Albany: State University of New York Press; Orr, David. 1994. *Earth in Mind: On Education, Environment, and the Human Prospect*, Covelo, California: Island Press; Orr, David. 2002. Four Challenges of Sustainability, *Conservation Biology* 16 (6), 1457-1460; Salafsky, Nick, Richard Margoluis, Kent Redford, and John Robinson. 2002. Improving the Practice of Conservation: A Conceptual Framework and Research Agenda for Conservation Science, *Conservation Biology* 16 (6), 1469-1479; Westley, Frances, and Philip Miller (eds.). 2003. *Experiments in Consilience: Integrating Social and Scientific Responses to Save Endangered Species*. Washington, DC: Island Press.
- ¹⁶ The definition of ecosystem integrity, like ecosystem health, is slippery. Most often integrity and health are used as a metaphor, juxtaposing the well-being of homeostatic organisms with self-organizing systems, e.g. people and ecosystems, respectively. Health and integrity are also ethics-laden concepts from medicine speaking to the physical flourishing of an organism. In this sense, health is akin to the Greek concept of eudaimonia, e.g. well-being. Bryan Norton attempts to operationally define ecosystem health and integrity by associating health with the autonomous functioning of complex natural systems, and integrity with maintaining the historical diversity of an ecosystem. See Norton, Bryan G. 2003. *Searching for Sustainability: Interdisciplinary Essays in the Philosophy of Conservation Biology*, Cambridge: Cambridge University Press, 176-179. For alternative perspectives on ecological health and integrity, see Aguirre, Alonso, Richard Ostfeld, Gary Tabor, Carol House, and Mary Pearl. 2002. *Conservation Medicine: Ecological Health in Practice*, New York: Oxford University Press; Pimentel, David, Laura Westra, and Reed F. Noss. 2001. *Ecological Integrity: Integrating Environment, Conservation, and Health*, Washington, DC: Island Press; Rockefeller, Steven C., Peter Miller, and Laura Westra ed. 2002. *Just Ecological Integrity: The Ethics of Maintaining Planetary Life*. Lanham: Rowan & Littlefield; Westra, Laura. 1998. *Living in Integrity: A Global Ethic to Restore a Fragmented Earth*, Lanham: Rowan & Littlefield.

- ¹⁷ See Grumbine, R. Edward. 1994. *Environmental Policy and Biodiversity*, Washington, DC: Island Press; Grumbine, R. Edward. 1996. Reflections on "What is Ecosystem Management", *Conservation Biology* 11 (1), 41-47; Lee, Kai N. 1993. *Compass and Gyroscope: Integrating Science and Politics for the Environment*, Covela: Island Press; Machlis, G. E., J. E. Force, and W. R. Burch. 1997. The Human Ecosystem, Part I: The Human Ecosystem as an Organizing Concept in Ecosystem Management, *Society and Natural Resources* 10, 347-367; Salwasser, Hal. 1994. Ecosystem Management: Can It Sustain Diversity and Productivity?, *Journal of Forestry* August, 6-10.
- In public debate, various terms reflect different evaluations of the quality and uses of conservation science. For example, non-governmental organizations frequently describe their advocacy as "science-based". They may even employ staff scientists or consultants to ensure the rigour of their policy recommendations (for an example, see the Annual Reports from Defenders of Wildlife, available at www.defenders.org). Professional societies of scientists, such as the Union of Concerned Scientists (UCS) recommend the use of the "best available science" in the formation of public policy. The UCS also has a "Sound Science Initiative" that tracks the integrity of science used in government reports (see Union of Concerned Scientists. 2004. Scientific Integrity in Policy Making, Cambridge: Union of Concerned Scientists). Yet sound science means different things to different constituencies. It is also a term adopted by political conservative and religious extremists to justify an ideological driven interpretation of scientific inquiry. It is what Paul and Anne Ehrlich term "junk science" in the service of anti-environmental agendas (see Ehrlich, Paul R., and Anne H. Ehrlich. 1996. *Betrayal of Science and Reason: How Anti-Environmental Rhetoric Threatens Our Future*, Covelo, California: Island Press; Lutz, William. 2004. "Sound Science" = Junk Science, *Defenders* (Spring), Available at www.defenders.org).
- Interestingly, while members of these three camps would certainly disagree on the character and rigour of science as it relates to environmental questions broadly (e.g. the "reality" of global warming) and wildlife conservation specifically (e.g. the "effectiveness" of the US Endangered Species Act), they all claim science is the basis for their approach to questions of sustainability. Such is the cultural power of science to valorize or marginalize a policy position or a worldview (see Editors. 2004. *Cheating Nature: Science and the Bush Administration*, *The Economist*, available from www.economist.com; Wakefield, Julie. 2004. *Sciences Political Bulldog*, *Scientific American*, available at www.scientificamerican.com).
- ¹⁸ Lynn, William S. 2004. The Quality of Ethics: Moral Causation in the Interdisciplinary Science of Geography, in Lee, Roger and David M. Smith, *Geographies and Moralities: International Perspectives on Justice, Development and Place*, London: Routledge, 231-244.
- ¹⁹ Dampier, William Cecil. 1984. *A History of Science, and Its Relations with Philosophy and Religion*, Cambridge: Cambridge University Press; Lindberg, David C. 1982. On the Applicability of Mathematics to Nature: Roger Bacon and His Predecessors, *British Journal for the History of Science* 15, 3-25; Lindberg, David C. 1992. *The Beginnings of Western Science: The European Scientific Tradition in Philosophical, Religious, and Institutional Context, 600 B.C. to A.D. 1450*, Chicago: University of Chicago Press.
- ²⁰ Damasio, Antonio, Anne Harrington, Jerome Kagan, Bruce McEwen, Henry Moss, and Rashid Shaikh (eds.). 2001. *Unity of Knowledge: The Convergence of Natural and Human Science*. New York: New York Academy of Sciences; Wilson, Edward O. 1998. *Consilience: The Unity of Knowledge*, New York: Alfred A. Knopf.
- ²¹ Bhaskar, Roy. 1975. *A Realist Theory of Science*, Leeds: Leeds Books; Mill, John Stuart (1987) *The Logic of the Moral Sciences*, La Salle: Open Court. Originally published in 1872; Nagel, Ernest. 1979. *The Structure of Science: Problems in the Logic of Scientific Explanation*, Cambridge: Hackett; Sayer, Andrew. 1984. *Method in Social Science: A Realist Approach*, London, UK: Hutchinson.
- ²² Chalmers, Alan. 1978. *What is This Thing Called Science? An Assessment of the Nature and Status of Science and its Methods*, London, UK: Open University Press; Chalmers, Alan. 1990. *Science and Its Fabrication*, Minneapolis: University of Minnesota Press; Wallerstein, Immanuel. 2001. *Unthinking Social Science: The Limits of Nineteenth Century Paradigms*, Second Ed., Philadelphia: Temple University Press.
- ²³ The definition of agency is usually tied to human beings. An "agent" is the author of his or her own actions, a person who acts out of cultural knowledge and authentic intention. Modern ethology makes it clear that agency is not a feature restricted to people and ethnology, but to many non-human animals. Obviously, human and non-human animals vary greatly in their cognitive capacities. Agency is therefore the ability of a self-conscious being to choose those actions that are within its power to do so. For more on human agency, see Taylor, Charles. 1985. *Human Agency and Language: Philosophical Papers 1*, Cambridge: Cambridge University Press. For animal agency, see Bekoff, Mark, Colin Allen, and Gordon Burghardt ed. 2002. *The Cognitive Animal: Empirical and Theoretical Perspectives on Animal Cognition*. Cambridge: MIT Press.
- ²⁴ Bekoff, Mark, Colin Allen, and Gordon Burghardt (eds.). 2002. *The Cognitive Animal: Empirical and Theoretical Perspectives on Animal Cognition*. Cambridge: MIT Press; Bellah, Robert N., Norma Haan, Paul Rabinow, and William Sullivan. 1983. *Social Science as Moral Inquiry*, New York: Columbia University Press; Bernstein, Richard J. 1991. *Beyond Objectivism and Relativism: Science, Hermeneutics and Praxis*, Philadelphia: University of Pennsylvania Press; Crease, Robert (eds.). 1997. *Hermeneutics and the Natural Sciences*. Dordrecht: Kluwer Academic Publishers; Denzin, Norman K., and Yvonna S. Lincoln (eds.). 2000. *Handbook of Qualitative Research*. Second edition, Thousand Oaks, California: Sage.
- ²⁵ Throughout this chapter I tend to speak in terms of "people, animals and nature", and it may be helpful to explain why I do so. The usual practice is to think in terms of binary opposites (paired but mutually exclusive categories), with one pole being humans, and the other pole being animals or wildlife or nature or the environment. Thus in various contexts we might hear about humans and nature, or culture and nature, or people and wildlife, or society and natural resources, or

the human-animal bond. What this practice tends to do is centre human beings (and our social institutions) in a moral and conceptual cosmos, orbited by various subjects such as domestic animals, wildlife, or wildlands.

Some believe this makes perfect sense because of humanity's putatively unique status in the universe. Common justifications include our favour in the eyes of a Creator, or our role as the most powerful creatures to evolve on the planet. Others believe these binaries are counterproductive, and would collapse one pole into the other. For example, at one extreme are sociobiologists who say human individuals and society are artifacts of genetic phenomena. At the other are "social construction of nature" theorists who claim nature is the artifact of socioeconomic forces. I cannot explore the details of these perspectives in this endnote or chapter, but one thing is obvious – their self-absorption with humanity.

It is to contest this self-absorption without diminishing the importance of human beings that I speak about people, animals and nature (PAN). PAN is not meant to be a mutually exclusive, empirical categorization of the world. *Homo sapiens* is certainly one kind of animal, with an evolutionary heritage and ecological relationship to a wider natural world. Rather, PAN is my attempt to direct our attention to three equally important spheres of moral concern. In this way, I may share in common with others a concern for the well-being of people, non-human animals, and the rest of the natural world. As importantly, I want to ensure that animals are not collapsed into an all inclusive nature, or that natural systems are not ignored when think about people and other animals. This is too often the case in environmental ethics and animal ethics respectively, where it works mischief in diverting or denying our attention to important moral questions.

- ²⁶ The social sciences are situated between the natural sciences and the humanities, and are alternatively praised or damned depending on where a commentator sits in this dichotomy.
- ²⁷ Readers interested in these and other fact/value questions may wish to consult Sorell, Tom. 1991. *Scientism: Philosophy and the Infatuation with Science*, London: Routledge.
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- ³⁴ Lynn, William S. 2005. *Practical Ethics: Moral Understanding in a More than Human World*, Book in progress; Weston, Anthony. 1997. *A Practical Companion to Ethics*, New York: Oxford University Press.
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- ³⁶ A provisional definition of scientific objectivity should centre on fair mindedness, that is, a willingness to change one's mind, an openness to evidence and argument, as well as an absence of prejudice and/or conflicts of interest.
- ³⁷ Attfield, Robin. 1999. *The Ethics of the Global Environment*, Purdue: Purdue University Press; Gales, Nick, Andrew Brennan, and Robert Baker. 2003. Ethics and Marine Mammal Research, in Gales, Nick, et al. (eds.), *Marine Mammals: Fisheries, Tourism and Management Issues*, Collingwood, Australia: CSIRO; Jamieson, Dale. 2002. *Moralities Progress*, New York: Oxford University Press; Midgley, Mary. 1984. *Animals and Why They Matter*, Athens: University of Georgia Press.
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- ⁴⁶ For more on whales and whaling, and sustainable yields, see Holt, Chapter 4, and Papastavrou and Cooke, Chapter 7.
- ⁴⁷ For more on the history of practical reason (in ancient Greek, *phronesis*), see MacIntyre, Alasdair. 1966. *A Short History of Ethics*, New York: MacMillan; MacIntyre, Alasdair 1984. *After Virtue: A Study in Moral Theory*, Notre Dame: University of Notre Dame Press.
- ⁴⁸ Lavigne, David. 2004. The Return of Big Brother, *BBC Wildlife Magazine* 22 (5), 70-72.
- ⁴⁹ Some of the ideas in that article are reiterated in Lavigne, Chapter 1.
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- ⁶⁴ Goulet, Denis. 1990. Development ethics and ecological wisdom, in Engel, J. Ronald and Joan Gibb Engel, *Ethics of environment and development: global challenge, international response*, Tucson, AZ: University of Arizona Press, p. 36. As one of my colleagues points out, this sensibility also applies to the maldevelopment of the so-called developed nations.
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