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The Infirm Ethical Foundations of Conservation

John A. Vucetich and Michael P. Nelson

Introduction

THAT CONSERVATION HAS an ethical foundation is widely appreciated. Less appreciated is the shambled condition of that ethical foundation. This condition is revealed by our inability to answer questions like, What is population viability and ecosystem health? and, Is conservation motivated only to meet the so-called needs of humans, or also by respect for nonhuman populations and ecosystems? Some argue that this ethical uncertainty does not impede the effectiveness of conservation. We provide examples that suggest otherwise. We also explain how the source of ethical uncertainty is our mistaken tendency to think that the morality of our behavior should be judged more on the consequences of our actions and less on the motivations that underlie our actions.

Conservation's aim is often thought or said to be to maintain and restore population viability and ecosystem health. Achieving conservation is difficult, but the framework for conservation's goals seems in place: Use the best available science and the precautionary principle as input for a decision-making process that will suggest which actions will most likely lead to the most desirable outcomes; use politico-legal force to turn desired actions into law or policy; and include some environmental education (e.g., media and formal curricula) to build social support. That education almost always reduces to describing how humans affect natural systems, as if that will shock or shame us into supporting conservation.

This framework rests, unfortunately, on an infirm foundation that casts doubt on whether we really understand the aim of conservation.

The answers to three questions illuminate the inadequacies of the foundation of conservation:

1. What is population viability and ecosystem health?
2. How does conservation relate to and sometimes conflict with other legitimate values in life, such as social justice, human liberty, and concern for the welfare of individuals, nonhuman animals? How should we resolve such conflicts?
3. Do populations and ecosystems deserve direct moral consideration?

These are the most important unanswered questions in conservation. Not having answers that are well defended and widely agreed upon has practical, on-the-ground consequences for conservation. Moreover, none of these questions are purely science questions. They are all philosophical or ethical in nature. This is disturbing because the ethics and philosophy of conservation may well be the most undertreated aspects of conservation. The very nature of conservation is, therefore, up for grabs because its ethical foundation is up for grabs. All the while, few people seem concerned. The need is not for each individual to answer the question in his or her own way; what is needed is the development of ethical consensus, which arises from ethical discourse (Nelson and Vucetich 2011).

An interlocutor might express skepticism: developing ethical consensus where there is none is impossible—not even among conservation professionals. Much evidence, however, speaks to our ability to develop ethical consensus (witness the abolition of slavery, women’s suffrage, civil rights). Moreover, if we cannot arrive at a reasonably broad consensus about the three big questions above, then conservation’s relationship to society will remain like a nation’s tax policy: everyone agrees that tax policy should balance equality and fairness, socialism and libertarianism—but no one agrees on what that means. Instead, we should want conservation’s relationship to society to be more like human medicine, which proceeds efficiently because we all agree on the aim (human health) and we all agree, more or less, on what human health means.

Answering “What is the aim of conservation?” is challenging because the question is broad and abstract, while at the same time the particulars of real conservation issues are so varied. It is difficult to identify principles that are general enough to entail most real issues, but not so broad and general as to be vacuous. To say that conservation is about maintaining and restoring population viability and ecosystem health is a bit too vacuous. By answering the three big questions, much that is vacuous will become firm. What follows is an exploration of how to approach the three big questions of conservation and the consequences of failing to take them seriously.

The Three Big Questions of Conservation

1. *What is population viability and ecosystem health?* Conventionally, population viability is assessed by estimating the probability that a population will go extinct over some time frame (Akçakaya, Burgman, and Ginzburg 1999). In principle, it is straightforward to estimate a population's extinction risk and to rank order extinction risk among a set of populations. In practice, both tasks tend to be especially difficult, in large part due to the limited availability of empirical data for most real populations.

Perhaps even more difficult is the task of determining the amount of extinction risk (the probability and time frame) beyond which a population would be considered endangered or not viable. For example, is a 5 percent chance of going extinct in 100 years an acceptably low chance of extinction? Or is a 10 percent chance of going extinct over 200 years more appropriate? No matter how extinction risk might be quantified, why is there so precious little discussion about such a profoundly basic question as, What is an unacceptable risk of extinction?

It seems straightforward to judge ecosystem health in the terms we use to describe ecosystems, that is, by: (i) their species richness and diversity; (ii) the nature of their ecosystem processes (e.g., nitrogen cycling) and ecological processes (e.g., predation or herbivory); (iii) temporal dynamics in these processes; and (iv) the spatial variation of ecosystems across landscapes (e.g., relative frequency of different kinds of ecosystems across landscapes).

One extreme, well-rehearsed perspective considers an ecosystem healthy to the extent that humans have not impacted it. From this perspective humans are a pathogen. Another extreme, well-rehearsed perspective considers an ecosystem healthy to the extent that it can continue providing resources and services that humans need. From this perspective humans are a parasite.

Our attempts to navigate this dichotomous notion of ecosystem health have been inept. For example, as we are increasingly faced with decisions about how to handle conservation-reliant systems (Scott et al. 2010), we find ourselves unable to avoid odd questions like, Is a human-altered ecosystem healthier when humans stop intervening, or when human intervention is used to return it to its prealtered state?

Another circumstance rises from our stumbling through the dichotomous view of ecosystem health. This circumstance, as odd as it is general, is represented by the question: On what portion of the landscape should we protect ecosystem health, and on what portion of the landscape should it be sacrificed for our use? The more familiar forms of this question are: How much wilderness

and bioserve area do we need? and, Should human impact be concentrated (e.g., intensive forestry on a small area) or diluted (e.g., less intensive forestry over a larger area)?

This attitude raises serious ethical questions, such as, On what ethical grounds can we justify respecting some ecosystems, but sacrifice others? This is *Sophie's Choice* manifest in our relationship with nature. The question also represents an ethical tragedy, a situation of our own making that seems to leave us with no acceptable choice. Moreover, this handling of the dichotomy never answers the question, What is a healthy ecosystem?

Despite the well-rehearsed problems with each perspective, each is rooted in a fundamental truth: humans can ruin ecosystems and humans need what ecosystems provide. But these perspectives also require believing that humans are separate from nature and require denying nature's intrinsic value. Both beliefs are unwise. Is it possible to develop a unified notion of ecosystem health that simultaneously recognizes: (i) humans can ruin ecosystems; (ii) humans need what ecosystems provide; (iii) humans are not separate from nature; and (iv) the value of healthy ecosystems for the sake of the ecosystem's interest, not just our own interest? What portion of conservation professionals concern themselves with this problem?

2. *How does conservation relate to and sometimes conflict with other legitimate values in life, such as social justice, human liberty, and concern for the welfare of individuals, nonhuman animals? How should we resolve such conflicts?* One approach to this question is to consider a useful definition of sustainability, which is "meeting human needs in a socially just manner without depriving ecosystems of their health [or populations of their viability]" (Nelson and Vucetich 2009c; Vucetich and Nelson 2010). Received definitions of sustainability suggest our unwillingness to, for example, sacrifice social justice in exchange for conservation and raise more particular questions like: Is it socially unjust to deprive a human community of their mode of living, if their mode of living deprives a nonhuman population of its viability or an ecosystem of its health? This question can be answered, but doing so requires: (i) a better understanding of what ecosystem health is; and (ii) an interest and ability to understand the nature of social justice, an interest and ability that seems well beyond the majority of conservation professionals and outside of the realm of what we normally think of as conservation science.

These questions would be ridiculous for anyone thinking that a particular conservation action was absolutely necessary for the survival or basic welfare of humanity. In that case, one might willingly pay almost any price for the conservation. The circumstance is, however, far more complex. Survival of the human

species does not, for example, depend on Kansas having intact grassland ecosystems or the Pacific Ocean having blue whales. We already have a pretty good idea about how humans can survive without these populations or ecosystems.

Still, we cannot ignore the “13th rivet” metaphor, which explains how the loss of any particular species or ecosystem may not be important for the welfare of humanity, but the collective loss of many populations and ecosystems is. This raises the problem of *how* we go about deciding how we ought to treat any particular population or ecosystem. For every proposed conservation action, we must know how/whether the benefits of that particular action are worth the ethical costs that action might incur on social justice, or animal welfare, or whatever the costs may be.

The point is, conservation is not the only legitimate value in society. Particular conservation actions sometimes conflict with other values, and no particular conservation action always and automatically trumps every other value. Consequently, knowing conservation’s role in society requires knowing how and why populations and ecosystems are valuable. In particular, we need to know how they are valuable beyond their utility to humans.

3. *Do populations and ecosystems deserve direct moral consideration?* This question is critical not only for conservation, and the academic field of environmental ethicists has generated a great deal of insight about how the question might be answered,¹ though it is largely unknown to many conservation professionals.

An important line of reasoning has been that direct moral consideration should be extended to anything possessing a morally relevant trait. Many consider sentience and the capacity for reason to be morally relevant traits, and some consider them to be the only morally relevant traits. If so, ecological collectives would not deserve direct moral consideration because they are not sentient or capable of reason. Another school of thought known as *biocentrism* argues that being alive is the morally relevant trait. While some of these scholars argue that ecological collectives are morally relevant because they are living *things*, others argue they do not deserve moral consideration because they are not living *individuals*. Each of these approaches represents a kind of thinking known as *extensionism*.

By contrast, some professional ethicists have argued that ecological collectives deserve direct moral consideration because they are the will of some deity. Ironically, some theological consideration suggests that only humans deserve direct moral consideration.

Another more secular approach has been to argue that ecological collectives deserve direct moral consideration because they and we are members of a shared biotic community, and all community members deserve moral

consideration. This was Aldo Leopold's contribution to environmental ethics. Deep Ecologists approach this question by first recognizing that humans deserve direct moral consideration, and then by recognizing that humans and ecological collectives are indistinguishable, and for these reasons ecological collectives deserve direct moral consideration.

In the process of developing these insights, some environmental ethicists have discovered a more basic challenge, which is, knowing what exactly is meant by the term *direct moral consideration*. First, as a matter of vocabulary, environmental ethicists generally say that a thing deserves direct moral consideration if it has intrinsic value, in contrast to having only instrumental (or use) value. The trouble is, what exactly is meant by intrinsic value.

Intrinsic value could be something that exists within certain things; implying intrinsic value is an objective property that can be discovered. In this case ethicists say to be intrinsically valuable is to be valuable in and of itself. However, intrinsic value may only exist in the mind of the valuer. In this case, intrinsic value would be value in addition to use value. Alternatively, intrinsic value may be more relational, that is, something that emerges from a valuer's relationship with certain things. Uncertainty about the meaning of intrinsic value amplifies the difficulty of answering the question, Do populations and ecosystems deserve direct moral consideration?

Answering this question would solve a great challenge for conservation. However, answering this question in the affirmative creates even more difficult ethical questions for conservation. Specifically, how to weigh and adjudicate among the disparate interests of humans and nonhumans.

Practical Implications

We have made a case that conservation's meaning, purpose, and relationship to the rest of society are inadequately understood. While many people believe that an infirm ethical foundation is no impediment to conservation (Norton 1994), there are many examples to the contrary, for example:

- *US Endangered Species Act*. The definition of endangered species in what is, arguably, the most powerful environmental law in the world is one that is not "in danger of extinction throughout all or a significant portion of its range." So, how much risk is too much risk? In general, judgments about excessive risks depend upon the consequences. For example, what counts as excessive risk for having rain on your picnic differs from what counts as excessive risk of dying due to the failure of your car's brakes. Similarly, what counts as an excessive risk of extinction will depend upon whether we think the American burying beetle is valuable only for human welfare or if it is also intrinsically valuable. In other words, appropriate conservation requires answering the

three big questions of conservation. The same conditions arise when considering the meaning of “significant portion of range” (Vucetich, Nelson, and Phillips 2006; Nelson, Phillips, and Vucetich 2007; Waples et al. 2007a, b; Carroll et al. 2010).

- *Conservation-Reliant Species*. There is an increasing awareness of the difficulty of knowing how to manage species that require perpetual human support or that may never be recovered (Scott et al. 2010). Polar bears and caribou are important examples. The great concern here is spending resources that will lead to no benefit. If ethics depend on consequences then this concern is appropriate. However, if ethics depends importantly on motivation, which it does, and if these species are intrinsically valuable, then this concern is moot. Our obligations to other humans, as a parallel, are not reducible to their benefit to us because we believe all humans possess intrinsic value. In other words, appropriate conservation requires us to answer the second and third big questions of conservation. These questions about conservation of reliant species, unrecoverable systems, and other hopeless cases apply to hundreds of species and hundreds of thousands of square miles of the earth’s surface.
- *Conservation’s Conflict with Animal Welfare*. Many conservation actions, including the control of exotic and invasive species, involve killing individual creatures. Is the cost of killing hundreds of individual barred owls worth the benefit of protecting populations of northern spotted owls (Welch 2009)? A common response is that the needs of conservation (here preserving northern spotted owl populations) trump the welfare of individual animals. However, one of the greatest developments in twentieth-century ethics has been the development of reasons to think that nonhuman animals and ecological collectives deserve direct moral consideration. Society’s appreciation for these reasons is increasingly apparent (e.g., Animal Welfare Act and Endangered Species Act). The ethical thing to do is not to deny the validity of one of these moral developments but to work toward an ethic that accommodates this conflict (Vucetich and Nelson in review). In other words, appropriate conservation requires answering the second big question of conservation.

The Ethics of Control and Consequence

We are all familiar with the narrative explaining how our conservation crisis has roots in our historic fetish for controlling nature (White 1967; Holling and Meffe 1996). However, this pathology has roots in a more basic limitation of Western ethics, which is—ironically—its failure to seriously confront the question: What deserves direct moral consideration?² Despite this long-standing limitation of Western ethics, its history provides important clues for how we might approach the question.

To capture the salient elements of this history in a few hundred words we paint with the crudest strokes:³ The ethic of those living prior to Aristotle, represented by characters of Homeric literature, was built on a belief that life had a purpose (what Aristotle referred to as *telos*), and that purpose was to be a good warrior. Moreover, ethics were the vehicle between how-we-are and how-we-ought-to-be, and the engine of this vehicle was virtues that, when manifest, give rise to how-we-ought-to-be. In Homeric days, the virtues included courage and cunningness, which were apropos given the purpose.

As the Homeric period gave way to the rise of Greek city-states, Aristotle codified the purpose of human life as being a good citizen of the city-state, and the accompanying virtues included justice, prudence, temperance, and magnanimity. As Europe fell into the Dark Ages, theologians and monarchs dictated a person's purpose, which was to atone for original sin and get to heaven. The virtues giving rise to this purpose were faith, hope, and humility. Importantly, Aristotle would have considered humility a vice. This basic framework for ethics (i.e., a conjoining of purpose and virtue) remained unchanged for more than two millennia. Today we call this framework *virtue ethics*. The essence of this ancient ethic focuses on how a moral agent should behave without much attention given to understanding who the moral patients are.⁴ That is, virtue ethics does not, by itself, try to answer the question, What deserves direct moral consideration?

With the Enlightenment, as the story goes, reason overthrew religious and monarchical tyranny. Another victim of the coup was Aristotle's metaphysics, especially his *telos* or notion of purpose, and subsequently our interest in virtue ethics. The difficulty had been that a sense of *telos* conjoined to religious and monarchical tyranny had been the primary motivators for behavior for the past thousand years. An ethical crisis emerged: On what now would ethics and behavior be based?

Ethicists occupied themselves with this question for the next couple of hundred years: Kant suggested that reason alone could be the foundation for determining what is ethical; and Hume suggested that emotion and feeling, along with intellect, should be the foundation for judging what is ethical. These developments in ethics were triumphs of human liberty. They were beautifully anthropocentric and contrasted to prior tendencies for life to be theocentric or monarchicentric.

Despite the insight that Kant and Hume offered, each account had the effect of revealing the inadequacies of the other. Kierkegaard took the failures of Kant and Hume as a basis for suggesting that we are free to decide whether ethics (reason) or aesthetics (feeling) should be the foundation for judging what is right and wrong. Nietzsche took the failures of Kant and Hume as evidence

that personal will was the only sensible basis for deciding how to behave. Hitler and Mussolini seem to be manifestations (though perhaps perverse) of his ideas.

Bentham and Mill suggested that the goodness of an action should be judged on the basis of maximizing happiness and minimizing suffering of humans. Their thoughts led to Consequentialism and Utilitarianism,⁵ which have been for the past 150 years the dominant framework for thinking about ethics generally and certainly the dominant form of ethical thinking within conservation.

A growing number of scholars are increasingly disturbed by several, well-rehearsed weaknesses of Consequentialism and Utilitarianism. For example, Utilitarianism is limited by our inability to judge and quantify happiness (Sen 1987; Putnam 2002; Moore 2004), especially in nonhumans. Utilitarianism does not provide a useful way of comparing happiness among, for example, a person, a goat, a population of Puerto Rican parrots, and a mangrove ecosystem. Human psychology also seems predisposed to overemphasize our happiness and underemphasize the happiness of others (Vucetich and Nelson 2007). In the absence of any constraints, Consequentialism reduces to an ethic for which “ends-justify-the-means” is the primary principle for judging morality, leaving open the possibility that any particular behavior (e.g., child slavery) could be justified if the benefits of the behavior outweighed the costs (Rachels and Rachels 2009).

Another limitation of Consequentialism is our inability to reliably predict the consequences of our actions except in the simplest of cases. Again this weakness is accentuated when thinking about our relationship with the environment, where the causal relationships between humans and nature are complex. According to Consequentialism, being unable to reliably predict consequences leaves one unable to know the morality of an action (including conservation actions). The unthinkability of being left in a state of amorality encourages us to exaggerate our ability to predict the consequences of our actions. Our obsession with controlling nature, which others have argued is a root cause of our environmental crisis (Holling and Meffe 1996), rises from our commitments to Consequentialism.

Consequentialism’s singular focus on consequences distracts our attention from being concerned with the motivations that underlie our actions. Focus on consequences runs contrary to a basic tenet that ethics is primarily about assessing the motivations for our actions. Lack of concern for motivation explains our inability to appreciate or answer the three big questions of conservation.

The most fundamental limitation of Utilitarianism is the inability to answer the question, What deserves direct moral consideration? The history of Utilitarianism suggests that moral consideration extends to those who can experience

happiness and suffering.⁶ But Utilitarianism cannot answer the question, What counts as happiness or suffering? nor is it equipped to determine who is capable of experiencing happiness and suffering. Science can answer some of these questions (Chandroo, Duncan, and Moccia 2004; Elwood and Appel 2009). However, other aspects of knowing who suffers and what counts as suffering may be metaphysical.⁷ For example, is an ecosystem overrun with exotic species an ecosystem that suffers? Science can describe the consequences of being overrun with exotic species but cannot say whether that counts as suffering, or whether an intact ecosystem counts as a flourishing ecosystem.⁸ Knowing whether an ecosystem can or cannot flourish may well require insights from outside the boundaries of science and ethics.

Another form of Consequentialism that is especially influential among conservation professionals is Pragmatism (Norton 1994; Katz and Light 1996; Minter and Collins 2005; Lockwood and Reiners 2009). The essential tenet of Pragmatism is that truth or meaning ought to be judged by practical consequences. A pragmatic ethic is judged, therefore, by its ability to solve ethical problems, as those problems are perceived. Although Pragmatism may seem commonsensical, it has long been deeply controversial among ethicists. Pragmatism is especially vulnerable to the criticism that the ends do not justify the means. Aside from the previously mentioned problems with thinking that ends justify means, Pragmatism is especially troublesome for conservation to the extent that we have not adequately identified the ends. That is, we still have not adequately answered the question, What is the aim of conservation? This makes conservation motivated by pragmatism like a missile without a guidance system.⁹

The Ethics of Virtue

The depraved morality that Utilitarianism offers has led a growing number of ethicists to think that an environmentally sustainable life requires rediscovering virtue ethics and reinventing it for contemporary life (Cafaro 2001; Sandler and Cafaro 2005; Hursthouse 2007; Sandler 2007). Such reinvigoration may also be necessary for shoring up the foundation of conservation and adequately specifying conservation's purpose. Recall that virtue ethics involves three aspects: (i) identifying the purpose of a person, (ii) identifying virtues necessary for manifesting one's purpose, and (iii) engaging in activities that promote the virtues.

With some reflection, it seems that the purpose of a person living a sustainable life would have to be *to treat others as one would be treated, if one were in their position*. This principle rises from the simple commitment that ethics be

rationally consistent and is known as the principle of ethical consistency (PEC) (Gensler 1996). Application of PEC requires empathy, a vivid, knowledge-based imagination about another's circumstance, situation, or perspective. Empathy is not an emotion, but a capacity that depends on objective, empirical knowledge (discovered by science and disseminated by education) about the conditions and capacities of others (to flourish and suffer). Empathy is required because PEC requires one to treat others only as one would consent to be treated if one were in their same situation. Principles of psychology indicate that one's empathy for an object is limited by one's familiarity with the object and the extent to which one observes similarity between one's self and the object (Preston and de Waal 2002).

For PEC to be useful in a conservation context empathy with nonsentient beings and ecological collectives would have to be possible. It is possible because we can observe similarity and have familiarity with nonsentient beings and ecological collectives. Not only is such empathy possible, we also admire those who exemplify such empathy. If the reader is unsure, go back and read Shel Silverstein's *The Giving Tree* and consider Aldo Leopold's capacity to "think like a mountain."¹⁰

Because PEC rises from principles of consistency, we are obligated to apply PEC consistently—that is, whenever possible. To do otherwise is to apply PEC arbitrarily, which would be unethical. Because we can become familiar and observe similarity with any living thing (including plants and fungus, and possibly unicellular organisms, and ecological collectives, such as species and ecosystems), we ought to do so.¹¹

PEC is important not only for being the purpose behind a virtue ethic applied to conservation ethics, but also because it answers the third big question of conservation, What deserves direct moral consideration? Knowing that the viability and health of populations and ecosystems is morally relevant for populations' and ecosystems' sake, and not only because we depend on their viability and health, provides much guidance for answering the first big question of conservation. Moreover, understanding that PEC applies to humans, nonhuman individuals, and ecological collectives leads to critical insight for responding to ethical conflicts that arise when conservation seems to conflict with social justice, human liberty, and concern for the welfare of individual animals. Although it would be valuable to elaborate further, here we only point out that the resolution to such conflict rises from the same principles we use regularly in our everyday lives to resolve other ethical conflicts, such as how do we balance a decision to be a good conservation scientist and our responsibility to be an environmental advocate (Nelson and Vucetich 2009b).

For emphasis, the claim is not merely that PEC is an appropriate rule to live by, but that a sustainable relationship with nature requires that manifesting PEC be the *purpose* of one's life, one's reason for living, and the overarching principle that guides all of one's actions and decisions. PEC would be the dominant narrative thread in one's life. The process of maturation would be defined by the process of continually improving one's ability to manifest PEC.

Given PEC as a purpose, here is a candidate list of virtues that would seem necessary and sufficient for promoting the manifestation of one's purpose:

1. *Constancy of Purpose, or knowing that one has a purpose.* If virtues help one manifest one's purpose, it may seem redundant that the first virtue is merely a reminder that one's life has a purpose. However, the postmodern world is characterized by, among other features, the decline of vocationalism and the rise of professionalism. With this shift, and the residual influences of Social Darwinism, the notion that life might have any purpose other than securing resources and safety is relatively unfamiliar to most. This virtue includes knowing that manifesting PEC is what makes one happy. For these reasons, the simplest and most basic virtue is simply knowing that one has a purpose and that this purpose is manifesting PEC.¹²
2. *Self-empowerment, or knowing that one is living a sustainable life, does not depend on others.* The postmodern world is fixated on "Tragedy of the Commons," the thought that individuals acting independently in their own self-interest ultimately destroy shared resources, in the absence of conditions that are difficult to accommodate. Understanding the Tragedy of the Commons is wise. However, being fixated on Tragedy of the Commons in a world committed to Consequentialism is devastating. Together they strip away all motivation to behave sustainably unless everyone else does the same (Nelson and Vucetich 2009a). However, if a sustainable (ethical) life is defined more by the motivations of our behaviors and less by their consequences, then living an ethical life has nothing to do with others' behavior and depends only on one's self.
3. *Empathy, or working to increase one's capacity to be empathetic with all humans, nonhuman individuals, and ecological collectives.* This needs to be a virtue because we are not a particularly empathetic people, and empathy is central to PEC.
4. *Connectedness, or seeing connectedness among all living things.* This needs to be a virtue because connectedness is the medium used to see that humans and nature are part of the same community, and because we have a long history of denying this connectedness. While many people would already be familiar with the value of this and the previous virtue, what might be less familiar is the role that conservation science plays in developing these virtues (see below).

5. *Sharing with one's community.* PEC raises a concern that ethicists refer to as *ethical overload*, the challenge of how to care for so many moral patients, many of whom have conflicting moral needs. While this is an important challenge, principles that are known to all of us are quite capable of handling this challenge. In particular, the principle of knowing when it is right to share with another. For example, should we share our lunch with a person we had constantly reminded to bring his or her own lunch? Perhaps. Doing so would be generous. But not sharing might also be appropriately just. The decision depends importantly on our motivation. To share or not might also depend on whether there was good reason for the person to have not brought a lunch. This case demonstrates the sophisticated mechanisms we already have for knowing when to share. The radical shift is to see sharing as a primary virtue for relating to nature. For example, knowing whether it is right to hunt wolves only requires knowing whether it is right for hunters to share deer and elk with wolves. One's obligation to grow wise in knowing when to share doesn't conflict with one's obligation to care for (i.e., being interested to share) with everything.
6. *Mourning, or knowing to grieve in the face of tragedy.* When confronted with challenges like whether to kill wolves or allow caribou populations to suffer greater extinction risk (DeCesare et al. 2010), we tend to deny the tragedy of the circumstance by claiming either that individual wolves do not count (if our concern was focused on the conservation of caribou populations) or that caribou populations do not count (if our concern was focused on individual wolves). Our tendency to deny tragedy is a general tendency reflected in our strong preference for Hollywood endings over those of Shakespearian tragedies. Mourning the circumstance of having to decide between wolves and caribou forces us to see that wolves are not the ultimate cause of caribou decline. Instead, mourning the tragedy motivates us to confront the ultimate cause, which is the overexploitation of boreal forests and gas exploration (Wittmer et al. 2007). Mourning in the face of tragedy is a virtue because it focuses attention on ultimate problems and encourages avoiding tragedies in the first place.

If this framework is sensible, then the greatest disappointment in a virtue ethic rooted in PEC is that it all seems too trite. That is, haven't we known since kindergarten that we ought to follow the Golden Rule? This reaction misses the salient point, which is about the underappreciated role of motivation (virtues) and the exaggerated role of consequences in our ethical thought. None of us recall a world that wasn't thoroughly dominated by Consequentialist thought. In this sense, virtue ethics is an unfamiliar mode of thought. However, because virtue ethics dominated the Western mind for nearly two millennia, it

is Consequentialist thinking that in the long run has been the unusual mode of thinking. Embracing virtue ethics and living sustainably will require the greatest shift in ethical thought in 400 years.¹³

The Purpose of Conservation Science and Education

Promoting the virtues requires contributions from individuals, communities, and institutions. Conservation science and education have a critical and unique role to play in promoting the virtues. Only science and education can discover and disseminate the objective, empirical knowledge necessary for increasing our capacity to empathize with others (including nonhumans) and see connections in nature. Empathy and seeing connectedness are keys to seeing how humans and nature are part of the same moral community. In this sense, science and education are critical for knowing how nonhumans are morally relevant. One might say that the central purpose of conservation science and education is to generate a sense of wonder for nature (Carson 1965; Moore 2005).

This view is a radical departure from the received view that the purpose of science is to predict and control nature. This view also departs from a commonly held view that the aim of environmental education is to shock or shame us into behaving sustainably by showing us how we damage nature and how we can mitigate our damage (Erhlich 1995). We won't care about the damage we cause or how to mitigate it until science and education foster a sense for how nature is morally relevant.

This new conservation science would differ in tangible ways from the old. We would, for example, be more interested in questions that increase our capacity for empathy than for control. We would also be more interested in communicating to larger audiences of the general public how and why our knowledge of nature leads us to love it. Our best guidance for this new science will likely come from contemplating the lives of heroes like Rachel Carson and Aldo Leopold. It is not so much their tangible accomplishments that impress us, instead the accomplishment that impresses us most is the kind of people they had become and the virtues they manifested.

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Notes

1. For a comprehensive review of these insights see DesJardins (2000) or Jamieson (2008).
2. The treatment of what is morally relevant has been handled very differently in different cultures. Traditional people of North America, for example, take for granted that many nonhuman things deserve direct moral consideration (Callicott and Nelson 2003; Moore et al. 2007).
3. The history of ethics and interpretation of virtue ethics presented here summarize the pioneer-

ing scholarship of A. MacIntyre (1984), whose work has sparked a resurgence of ethicists' interest in virtue ethics that continues growing to this day.

4. A moral agent has the capacity to behave morally, and a moral patient is something that deserves direct moral consideration.

5. Utilitarianism is a more specific form of Consequentialism. The central tenet of Consequentialism is that the rightness of an action is determined by the consequences of an action. Utilitarianism presumes that the consequence of an action should aim to produce the most possible utility, happiness, or pleasure for the most people.

6. Scholars actively debate whether sentience is merely the capacity to suffer or the ability to be conscious of experienced happiness or suffering. There is also debate about the meaning of "consciousness" (Duncan 2006).

7. We mean metaphysical in the sense that some claims about the nature of reality cannot be answered by science or ethics alone.

8. "Happiness" might be inappropriately narrow for the purpose of this conversation. "Flourishing" is likely more appropriate (Cuomo 1998).

9. P. Pister, the fish conservationist, shared this expression with us.

10. Empathizing with nonhumans often raises concerns about anthropomorphism (de Waal 1999; Sober 2005; Bekoff 2006). That concern is appropriately handled by the careful use of language and knowledge about the biology of the nonhuman being spoken of.

11. We are not the first to suggest that the key to conservation ethics is recognizing how PEC is applicable to humans, nonhuman individuals, and ecological collectives (see e.g., Gould 1990).

12. MacIntyre (1984) provides a complete explanation for why constancy of purpose should be a virtue.

13. MacIntyre (1984) believed that we would not make the transition from Utilitarianism to virtue ethics smoothly and believes we are now entering the beginning of what might be called the second Dark Ages.

References

- Açakaya, H. R., M. A. Burgman, and L. R. Ginzburg. 1999. *Applied Population Ecology*. 2nd ed. Sunderland, MA: Sinauer Associates.
- Bekoff, M. 2006. "Animal Passions and Bestly Virtues: Cognitive Ethology as the Unifying Science for Understanding the Subjective, Emotional, Empathic, and Moral Lives of Animals." *Zygon* 41: 71–104.
- Cafaro, P. 2001. "Thoreau, Leopold, and Carson: Toward an Environmental Virtue Ethics." *Environmental Ethics* 22: 3–17.
- Callicott, J. B., and M. P. Nelson. 2003. *American Indian Environmental Ethics: An Ojibwa Case Study*. Englewood Cliffs, NJ: Prentice Hall.
- Carroll C., J. A. Vucetich, M. P. Nelson, D. J. Rohlf, and M. K. Phillips. 2010. "Geography and Recovery under the U.S. Endangered Species Act." *Conservation Biology* 24: 395–403.
- Carson, Rachel L. 1965. *The Sense of Wonder*. New York: Harper and Row.
- Chandroo, K. P., I. Duncan, and R. D. Moccia. 2004. "Can Fish Suffer? Perspectives on Sentience, Pain, Fear and Stress." *Applied Animal Behaviour Science* 86: 225–50.
- Cuomo, C. J. 1998. *Feminism and Ecological Communities: An Ethic of Flourishing*. New York: Routledge.
- DeCesare, N. J., M. Hebblewhite, H. S. Robinson, and M. Musiani. 2010. "Endangered Apparently: The Role of Apparent Competition in Endangered Species Conservation." *Animal Conservation* 13: 353–62.
- DesJardins, J. R. 2000. *Environmental Ethics: An Introduction to Environmental Philosophy*. New York: Wadsworth.
- Duncan, I. 2006. "The Changing Concept of Animal Sentience." *Applied Animal Behavior Science* 100: 11–19.
- Ehrlich, P. R. 1995. "The Scale of Human Enterprise and Biodiversity Loss." In *Extinction Rates*, edited by J. H. Lawton R. M. May, 214–24. Oxford: Oxford University Press.

- Elwood, R. W., and M. Appel. 2009. "Pain Experience in Hermit Crabs?" *Animal Behaviour* 77: 1243–46.
- Gensler, H. J. 1996. *Formal Ethics*. London: Routledge, chaps. 5 and 6.
- Gould, S. J. 1990. "The Golden Rule? A Proper Scale of our Environmental Crisis." *Natural History* 9: 24–30. Reprinted in L. Pojman and P. Pojman, eds. 2007. *Environmental Ethics: Readings in Theory and Application*. 5th ed. New York: Wadsworth.
- Holling, C. S., and G. K. Meffe. 1996. "Command and Control and the Pathology of Natural Resource Management." *Conservation Biology* 10: 328–37.
- Hursthouse, R. 2007. "Environmental Virtue Ethics." In *Working Virtue: Virtue Ethics and Contemporary Moral Problems*, edited by R. L. Walker and P. J. Ivanhoe, 155–71. New York: Oxford University Press.
- Jamieson, D. 2008. *Ethics and the Environment: An Introduction*. Cambridge: Cambridge University Press.
- Katz, E., and A. Light, eds. 1996. *Environmental Pragmatism*. London: Routledge.
- Lockwood, J., and W. Reiners. 2009. *Philosophical Foundations for the Practices of Ecology*. Cambridge: Cambridge University Press.
- MacIntyre, A. 1984. *After Virtue: A Study in Moral Theory*. 2nd ed. Notre Dame, IN: University of Notre Dame Press.
- Minteer, B. A., and J. P. Collins. 2005. "Why We Need an Ecological Ethics." *Frontiers in Ecology and the Environment* 3: 332–37.
- Moore, K. 2004. *Pine Island Paradox*. Minneapolis: Milkweed.
- Moore, K. D. 2005. "The Truth of the Barnacles: Rachel Carson and the Moral Significance of Wonder." *Environmental Ethics* 27: 265–77.
- Moore, K. D., K. Peters, T. Jojola, and A. Lacy, eds. 2007. *How It Is: The Native American Philosophy of V. F. Cordova*. Tucson: University of Arizona Press.
- Nelson, M. P., M. Phillips, and J. A. Vucetich. 2007. "Normativity and the Meaning of Endangered, a Comment on Waples et al." *Conservation Biology* 21: 1646–48.
- Nelson, M. P., and J. A. Vucetich. 2009a. "Abandon Hope." *The Ecologist* (March).
- . 2009b. "On Advocacy by Environmental Scientists: What, Whether, Why, and How." *Conservation Biology* 23: 1090–101.
- . 2009c. "True Sustainability Needs an Ethical Revolution." *The Ecologist* (December 31). www.theecologist.org/blogs_and_comments/commentators/other_comments/383966/true_sustainability_needs_an_ethical_revolution.html.
- . 2011. "Environmental Ethics and Wildlife Management." In *Human Dimensions of Wildlife Management*, edited by W. Siemer, D. Decker, and S. Riley, forthcoming. Baltimore: Johns Hopkins University Press.
- Norton, B. 1994. *Toward a Unity among Environmentalists*. Oxford: Oxford University Press.
- Preston, S. D., and F. B. M. de Waal. 2002. "Empathy: Its Ultimate and Proximate Bases." *Behavioral and Brain Sciences* 25: 1–7.
- Putnam, H. 2002. *The Collapse of the Fact/Value Dichotomy and Other Essays*. Cambridge, MA: Harvard University Press.
- Rachels, J., and S. Rachels. 2009. *The Elements of Moral Philosophy*. 6th ed. New York: McGraw-Hill.
- Sandler, R. 2007. *Character and Environment: A Virtue-Oriented Approach to Environmental Ethics*. New York: Columbia University Press.
- Sandler, R., and P. Cafaro, eds. 2005. *Environmental Virtue Ethics*. New York: Rowman and Littlefield.
- Scott, J. M., D. D. Goble, A. M. Haines, J. A. Wiens, and M. C. Nee. 2010. "Conservation-Reliant Species and the Future of Conservation." *Conservation Letters* 3: 91–97.
- Sen, A. 1987. *On Ethics and Economics*. New York: Blackwell.
- Sober, E. 2005. "Comparative Psychology Meets Evolutionary Biology: Morgan's Canon and Cladistic Parsimony." In *Thinking with Animals*, edited by L. Daston and G. Mitman, 85–99. New York: Columbia University Press.
- Vucetich, J. A., and M. P. Nelson. 2007. "What Are 60 Warblers Worth? Killing in the Name of Conservation." *Oikos* 116: 1267–78.

- . 2010. “Sustainability: Virtuous or Vulgar?” *Bioscience* 60: 539–44.
- . In review. “Resolving the Conflict between Conservation and Animal Welfare.” *Conservation Biology*.
- Vucetich, J. A., M. P. Nelson, and M. K. Phillips. 2006. “The Normative Dimension and Legal Meaning of ‘Endangered’ and ‘Recovery’ within the United States’ Endangered Species Act.” *Conservation Biology* 20: 1383–90.
- de Waal, F. 1999. “Anthropomorphism and Anthropodenial: Consistency in Our Thinking about Humans and Other Animals.” *Philosophical Topics* 27: 255–80.
- Waples R. S., P. B. Adams, J. Bohnsack, and B. L. Taylor. 2007a. “A Biological Framework for Evaluating Whether a Species Is Threatened or Endangered in a ‘Significant Portion of Its Range.’” *Conservation Biology* 21: 964–974.
- . 2007b. “Normativity Redux.” *Conservation Biology* 21: 1649–50.
- Welch, C. 2009. “The Spotted Owl’s New Nemesis.” *Smithsonian* magazine (January).
- White, L. T. 1967. “The Historical Roots of Our Ecological Crisis.” *Science*, 155: 1203–7.
- Wittmer, H. U., B. N. McLellan, R. Serrouya, and C. D. Apps. 2007. “Changes in Landscape Composition Influence the Decline of a Threatened Woodland Caribou Population.” *Journal of Animal Ecology* 76: 568–79.