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Michael Paul Nelson | Tackling environmental crises requires moral as well as scientific clarity.

Ground Rules for Ethical Ecology

As an environmental ethicist, I routinely sit in meetings where the word "sustainability" is uttered reflexively or employed as blanket justification for almost any program. Often, people utter the word without seriously considering its complex, multilayered meaning. One influential definition of sustainability comes from a 1987 United Nations–sponsored report: "meeting human needs in a socially just manner without depriving ecosystems of their health." But as Michigan Tech ecologist John A. Vucetich and I pointed out in a 2010 article in *BioScience*, you can read this definition in many different ways depending on your assumptions of what is "good" and "bad" and how you interpret "human needs" and "ecosystem health." Depending on your perspective, sustainability could mean anything from "exploit as much as desired without infringing on the future ability to exploit as much as desired" to "exploit as little as necessary to maintain a meaningful life."

The researchers and officials who craft environmental policies (or not) have to navigate this vast range of ideas about moral responsibility. And yet, when we talk about sustainability, we rarely clarify what assumptions we are bringing to the table. Failure to have direct conversations about what we value and why has contributed to inaction and political paralysis in confronting enormous ecological challenges such as climate change. Ethical arguments can move hearts and public opinion in a way that mere facts and data simply cannot. If we want to try to live more sustainably, we need scientific information, yes, but we also need to decide what we value and what we consider ethically acceptable, and then to enact policies that encompass both scientific and ethical realities.

Despite my background in philosophy, I spend most of my time working with scientists, specifically ecologists and conservation social scientists. My faculty home is in a college of forestry; I have participated on a long-term study of wolves and moose on Lake Superior; and I serve as the lead principal investigator of a Long-Term Ecological Research (LTER) program at Oregon State University studying a magnificent old-growth forest at the H. J. Andrews Experimental Forest in the Oregon Cascades. I move among scientists who care deeply about the natural world and understand much about how it is unraveling.

Our current intertwined environmental crises—not just climate change, but also zoonotic disease pandemics, pollution, food insecurity, and biodiversity loss—are scientific problems; they are also economic and technological problems. But most notably, they are ethical problems that demand an ethical response. These environmental crises have grown out of ethical assumptions that Western nations have made over centuries about our proper role in the natural world. Recognizing and challenging these assumptions could transform our relationship with the Earth and shift public attitudes, allowing new approaches to policy decisions and motivating scientists to incorporate ethics into how they think about, talk about, and conduct their research. Continuing to separate ethics from science, on the other hand, will likely result in more incomplete, and ultimately ineffective, responses to each crisis.

To speak metaphorically, science (and, indeed, life itself) is not a dry land pursuit that sometimes requires fording a lake or stream of values and ethics; it is more like being on a raft in a sea of values and ethics. Although you cannot avoid this sea, you can navigate it with more or less success. Given the breadth of possible meanings of sustainability, for instance, nearly anyone working within conservation or natural resources management could believe their work fits under the sustainability banner. Those who advocate for clear-cutting old-growth forests can point to the renewability of trees as consistent with sustainability, whereas those who advocate for not harvesting forests can point instead to enhanced carbon sequestration. Only by engaging directly with the ethical dimensions of sustainability—what we truly value and why—can the two sides have a meaningful and productive conversation.

The relationship between science and ethics is complicated, thorny, and often misunderstood. Yet, there is great power and importance in connecting these two practices. If we are to rise to the challenges of the 21st century, we will need both in equal measure.

Common Ground

Many scientists tell me that they regard ethics as a subjective pursuit, contrasted

QUICK TAKE

The overlapping ecological crises humanity currently faces—climate change, pollution, biodiversity loss, to name a few—are moral and ethical as well as scientific problems.

The relationship between science and ethics is complicated, thorny, and often misunderstood, but we need both scientific facts and ethical arguments to address these crises.

Ethical and moral arguments start with clearly stating what we value and why, and can inspire collective action and form the basis for sound policies and scientific research.

R. O. Peterson

On the remote and wild Isle Royale in Lake Superior, the isolated populations of wolves and moose are deeply interconnected. Researchers have been documenting this fascinating ecological drama for more than six decades. Their work provides a case study in conservation ethics that raises questions about the optimal role of humans in managing nature.

with the objectivity of science. But science is not as objective as many of my colleagues like to believe, and ethics is not entirely subjective.

The work I do with the H. J. Andrews LTER program is classified as *conservation ethics*. We use the tools of philosophical analysis to formulate and evaluate real-world conservation questions such as: Should we suppress one species to save or enhance another? In the Pacific Northwest, where I live, there are proposals to kill barred owls that compete with endangered spotted owls in old-growth forests, or to kill sea lions to protect dwindling salmon populations. Our work lays out and evaluates the arguments on each side of such debates.

To clarify the issues involved, ethical arguments can be formulated and assessed with a logical structure called *argument analysis*. A logical argument contains a set of (P) premises (or evidence) and a (C) conclusion, which break complex ideas into their components. In an ethical argument, at least one of the premises will contain a value or ethical statement as well. This is an example of a logical argument:

P1. Old-growth forests sequester huge amounts of carbon.

P2. The H. J. Andrews Experimental Forest is an old-growth forest.

C. Therefore, the H. J. Andrews Experimental Forest sequesters huge amounts of carbon.

And this is an example of an ethical argument:

P1. Old-growth forests sequester huge amounts of carbon.

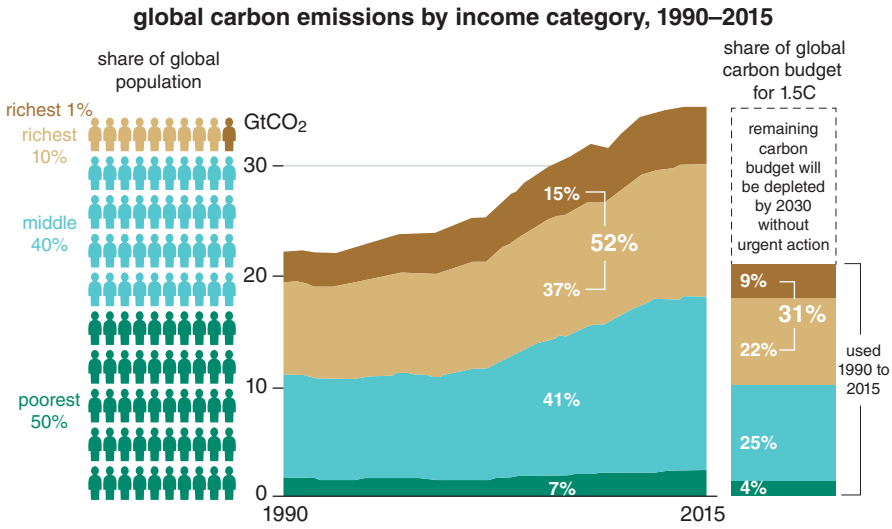
P2. Sequestering carbon is critical in the effort to fight climate change.

P3. We ought to do whatever we can to fight climate change.

C. Therefore, we ought to protect old-growth forests.

Once an ethical argument is articulated, we can begin critiquing and possibly modifying, accepting, or rejecting that argument. In this way, ethical questions can be handled systematically, rigorously, and transparently, in much the same way that researchers approach scientific questions. The logical approach also suggests that a proposed action or policy (above, "C. Therefore, we ought to protect old-growth forests") brings together both science and values. If you want morally sound, socially responsive, and feasible policy, you need both science and ethics. In order to take action on climate change, for example, you need to 1) acknowledge that it is happening, 2) acknowledge that it will harm future generations more than it harms those of us who have helped create the problem today, and 3) come to the conclusion that causing unnecessary and disproportionate harm to future generations is a moral wrong.

The failure to see the necessity of both scientific and value premises, articulate each clearly, assess their veracity, and ensure the conclusions follow from real evidence almost guarantees failure to make headway on critical environmental issues. These points may



Per capita income threshold [SPP 2011] of richest 1%: $109k; richest 10%: $38k; middle 40%: $6k; and bottom 50%: less than $6k. Global carbon budget from 1990 for 33% risk of exceeding 1.5C: 1,205 Gt.

OXFAM

Over the past 25 years, the richest 10 percent of the world's population have contributed 52 percent of the cumulative human-generated carbon emissions, whereas the poorest 50 percent contributed just 7 percent of those emissions. And yet, key impacts of climate change—including drought and rising sea levels—are expected to disproportionately affect the poorest communities.

seem obvious, yet they are frequently obscured or ignored in actual discussions of policy.

Cost–Benefit Trap

I've spent a lot of time in my career examining *why* ethics is so misunderstood. When I engage scientists and conservation managers in ethical conversations about their work, they commonly reduce ethics to one type of ethic: *consequentialism*, a moral calculus in which the ethical value of a decision is measured by weighing the costs of doing X against the benefits of doing X. For example, in parts of the United States where wolves have returned, wildlife managers debate whether we ought to let people hunt wolves. These conversations are almost entirely framed in consequentialist terms, with managers attempting to weigh tangible costs and benefits of instituting a wolf hunt. For instance, they might consider whether adding a wolf hunting season would generate useful revenue, or whether it would erode their agency's public support.

Confusing consequentialism for ethics writ large makes sense in a Western context, given our long-standing cultural focus on cost–benefit analysis as a means to judge so much in our lives. But consequentialism is hardly the only form of ethical reasoning. Sometimes we consider what rights we believe individuals possess; sometimes we strive to manifest certain virtues, such as empathy, care, respect, integrity, and love; and sometimes we consider whether we ought to adhere to the commands of a divinity or strive to mesh our actions with what we assume is "natural."

In our writings about wolf hunting, Vucetich and I have argued that the morality of killing a living creature depends on being able to provide a good reason to do so. A wildlife manager who fails to look beyond a cost–benefit analysis of a wolf hunting program might also fail to fully and appropriately grapple with whether they have a "good reason" for killing a wolf based on the best available ecological research. This could lead to the introduction of bad policies that don't reflect the best possible ethical or scientific judgments.

Ethical arguments can move hearts and public opinion in a way that mere facts and data simply cannot.

Ethical Confusion

Another source of misunderstanding is that ethics is often confused with politics. In 2007, Vucetich and I wrote an article analyzing an ethical debate among ecologists about whether it was acceptable that a group of researchers had killed 60 to 120 black-throated blue warblers in order to observe the behavior of a remaining mating pair. Afterward, a well-known ornithologist wrote to chide us, saying our perspective represented "politics and advocacy" instead of science and ethics. We were indeed advocating for the tools of ethical analysis, but we weren't attempting to determine policy. We didn't take a side in the debate. Rather, we were setting out ethical principles that others could use in making their own research or policy decisions.

People often conflate political or legal decisions with ethical ones. The warbler experiment met the official standards for such research, but that does not necessarily mean it was ethically appropriate. Something can be legal and unethical at the same time.

People also often conflate ethics with social science. Social science employs systematic and rigorous methods to *describe* some element of the human world: for example, the way that a specific group of people value wildlife, or how people attempt to explain away cognitive dissonance. Ethics, on the other hand, is a philosophical or conceptual exercise that attempts to *assess* and *prescribe* a right or good course of action: for example, whether trophy hunting is an appropriate kind of relationship with the nonhuman world, or whether reparations ought to be paid to historically oppressed communities. Social science might tell us how willing the public would be to accept a new policy, such as hunting wolves, but it cannot determine whether that policy is "right" or "wrong." That is an exercise in ethics.

"Ought," Not "Is"

It is common to confuse a description of what "is" with a prescription of what we "ought" to do—to say, "Here's how we have done this in the past" and immediately jump to, "This is how we ought to do this now." Just think how often people invoke the importance of "traditional values." Or we might describe some condition as "natural" and imply that it is therefore also "good." In forestry, researchers often try to determine how frequently and how severely a forest burned before European settlers arrived and modified the local fire regime. People often interpret this historic baseline as a description of what is natural and good, which can therefore be used to justify certain forestry practices. A timber company might argue, for instance, that

their clear-cutting mimics a historic (and therefore "natural and good") pattern of severe and infrequent fires.

This kind of reasoning is fallacious, because it conflates a supposedly natural state of being with what is ethically right. Most of the time the conflation between *is* and *ought* seems to be unintentional, but in certain instances it is designed as an intentional manipulation.

Ethicists call this the *is/ought fallacy*: the illogical attempt to muscle out a prescription for action based on a set of factual claims alone. To arrive at a prescription for action (such as "we ought to act to avert the sixth great extinction"), you must, as a matter of logic, bring to the table both empirical premises ("the sixth great extinction is happening") and ethical or so-called *normative* premises ("causing the loss of biodiversity is morally wrong").

Ian Vorster/OSU via CC-BY from https://andrewsforest.oregonstate.edu

In his studies of old-growth forests at the H. J. Andrews Experimental Forest in the Oregon Cascade Mountains, the author and his colleagues use rigorous ethical analysis to guide conservation decisions. His work shows that ethics is not as subjective as many people tend to believe.

Call to Action

The widespread misunderstanding and misapplication of ethics has come with a significant cost. Social science research on persuasion and messaging over the past 50 years has demonstrated repeatedly that providing people with ostensibly objective facts typically fails to elicit behavioral change. By contrast, appeals that engage ethical reasoning can have lasting effects. And yet for a long time, even as scientists warned about the impacts of climate change, our philosopher colleagues did not speak publicly or clearly about the associated ethical implications.

Too many of us who are concerned about climate change have been committing the is/ought fallacy: attempting to motivate actions in response to climate change from scientific descriptions alone, without articulating what we value, what is worth saving, and what we hold dear.

In response, Oregon State University professor emeritus of philosophy Kathleen Dean Moore and I edited a climate change ethics book, *Moral Ground: Ethical Action for a Planet in Peril*. We wrote to 100 of the world's moral leaders and asked them, "Is it wrong to wreck the world? Why?" We received many powerful replies. It is wrong to wreck the world, some responded, because this world is a gift and that is not how you reciprocate when given a gift. It is wrong because the world is filled with beauty, and beauty should be protected. It is wrong because it inflicts harm upon and steals from future generations.

In the 11 years since our book was published, we have seen an outpouring of moral responses to climate change from scientists including Michael Mann and James E. Hansen, individuals who have benefitted from fossil fuels such as Valerie Rockefeller Wayne, moral leaders such as Pope Francis, and climate activists such as Greta Thunberg. As social activist Naomi Klein said in 2015: "[T]here is nothing more powerful than a values-based argument. We're not going to win this as bean counters. . . . We're going to win this because this is an issue of values, human rights, right and wrong." I am hopeful that a shift in the way we talk about climate change could allow us to finally see this phenomenon as a moral, as well as scientific, crisis and to respond effectively.

Ideas Are Choices

In the end, ethical arguments matter because they guide action. We live in a world of contested ideas and concepts that make themselves known in the real world in real ways. These disputes are the source of our current challenges, and they are the solutions as well. Here's the kicker: Many if not most of those ideas are choices. We choose to be anthropocentric (human centered), or not. We choose to attribute intrinsic value to nature, or not. We choose to see ourselves as part and parcel of the world and to empathize with the plight of species and ecosystems, or not.

In a recent paper, conservationists Myanna Lahsen and Esther Turnhout of Wageningen University suggested there is a logic within environmental science that works to resist rethinking and reform. They argue that the current structure of power and funding focuses on the natural sciences over much-needed sociopolitical research on urgent issues such as climate change. Shifting focus, and funding, breeds resistance and fear of losing scientific authority among those who benefit from the way things are now. This is a familiar reaction against proposed institutional change. It's also a maladaptive logic that results in the continued exclusion of other disciplines such as ethics, and it works against critical self-reflection and perpetuates the status quo at a time when we need status quo disruption.

I urge us all to see the power and importance of ethical thinking. I urge my scientific colleagues to engage in critical self-reflection and evaluation of their own disciplines, and to be more open to ideas from other fields. Climate change, biodiversity loss, food insecurity, and pandemics pose perhaps the greatest set of challenges that we humans have ever faced. Philosophy and ethics will be a crucial part of the unbridled imagination needed to solve them.

(*References are available online.*)

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