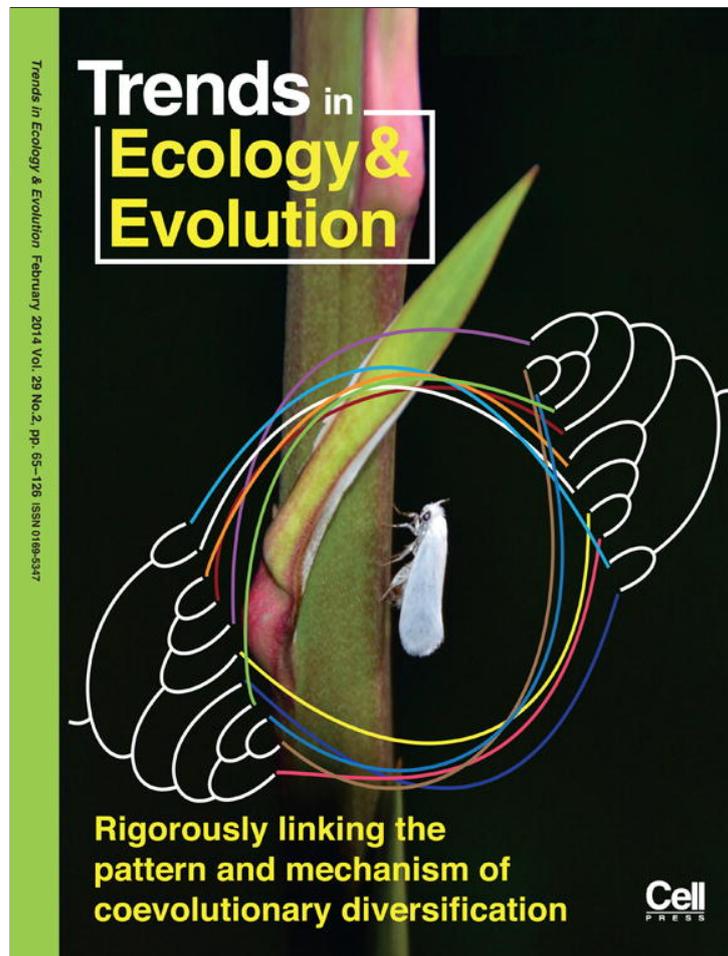


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What is the future of conservation?

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In recent years, some conservation biologists and conservation organizations have sought to refocus the field of conservation biology by de-emphasizing the goal of protecting nature for its own sake in favor of protecting the environment for its benefits to humans. This 'new conservation science' (NCS) has inspired debate among academics and conservationists and motivated fundamental changes in the world's largest conservation groups. Despite claims that NCS approaches are supported by biological and social science, NCS has limited support from either. Rather, the shift in motivations and goals associated with NCS appear to arise largely from a belief system holding that the needs and wants of humans should be prioritized over any intrinsic or inherent rights and values of nature.

Shaking up the motives and practices of conservation

Throughout its history, and across the globe, environmental conservation has been motivated by a wide range of ethical, utilitarian, aesthetic, and economic concerns. However, a recent and much publicized campaign, originating within the conservation community, marginalizes nature's inherent value in favor of a primarily human-centered conservation ethic. Spearheaded by prominent advocates, this viewpoint has been advanced in both popular and scholarly outlets (see [1–3]) and has received considerable news coverage (e.g., recent articles in *Time*, *Slate*, and *The New York Times*). The message – that the moral imperative of environmental conservation (henceforth, 'conservation') should be to maximize the welfare of humans (see [1,2,4,5]) – is increasingly popular among academics and policy makers and dovetails with tactical shifts in the mission statements of many conservation organizations (Table S1 in the supplementary material online) [6–8]. This movement seeks not a subtle shift in the methods of conservation, but a stark change in its fundamental goals and methods: 'Instead of pursuing the protection of biodiversity for biodiversity's sake, a new conservation should seek to enhance those natural systems that benefit the widest number of people' [1].

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Here we examine the claims and assumptions of those advocating for NCS, a term we use because it has been adopted by some of the leading advocates of this position [2]. This analysis is important because NCS proponents have asserted that most current and past conservation is poorly done, wrongly motivated, and scientifically unsupported. Given that this position is directly affecting conservation practices, both the claimed failures of past efforts and the promises concerning their alternatives warrant careful scrutiny.

Central premises of the NCS argument

NCS advocates begin by suggesting that there are many flaws in traditional approaches to conservation. (i) Conservation emphasizes protection of biodiversity without regard for human welfare, resulting in regular harm to disadvantaged peoples and impediments to business and development (see [1,2]). (ii) Conservation rests on the myth of a pristine nature and its core purpose is to conserve and restore this state, which in fact never existed: 'We create parks that are no less human constructions than Disneyland' [1]. (iii) Conservationists wrongly assume that nature is inherently fragile and will sustain irreparable damage from human activities: 'Nature is so resilient that it can recover rapidly from even the most powerful human disturbances' [1]. (iv) Conservation has failed to protect biodiversity. Although we have created many protected areas, extinctions and ecosystem degradation continue: 'Protecting biodiversity for its own sake has failed' [1]. (v) Conservation is also failing socially, with dwindling support from a mostly affluent, white minority: 'Conservationists are losing the battle to protect nature because they are failing to connect with the hearts, anxieties, and minds of a large segment of the American public' [9].

Given these perceived ills, NCS advocates call for the following remedies. (i) The primary objective of conservation should be to protect, restore, and enhance the services that nature provides to people: 'The ultimate goal is better management of nature for human benefit' (P. Kareiva, quoted in [10]). (ii) To succeed, conservationists need to ally with corporations and other significant economic actors: '21st century conservation tries to maximize biodiversity without compromising development goals' [11]. (iii) Conservationists should increase their focus on urban areas and on landscapes and species most useful to humans, because human benefits should drive conservation efforts: 'Forward-looking conservation protects natural habitats where people live and extract resources and works with corporations to find mixes of economic and

conservation activities that blend development with a concern for nature' [1].

What's wrong with these claims and remedies?

Although we focus here on the principal shortcomings in NCS's central claims and remedies, we also note that many specific examples and points of evidence offered to bolster NCS positions are poorly supported or misleading (see [12–17], and Tables S2 and S3 in the supplementary material online).

Human well-being is already one of the core features of conservation policy and planning

Conservation's concern for biodiversity has always been accompanied by concern for human well-being and ecosystem services; these human-centered goals form one pillar of a diverse mix of motivations and strategies dating back at least a century to Gifford Pinchot and his predecessors [7,18–20]. Harkening back to Pinchot (e.g., 'The first principle of conservation is development, the use of the natural resources now existing on this continent for the benefit of the people who live here' [18]), efforts to understand and protect ecosystem services have long been an important plank in the conservationist's platform. More quantitatively, most federal lands in the USA that are in some sense managed for conservation are primarily devoted to the generation of ecosystem services (Figure 1). Emphasis on human use of natural areas is also typical of other countries; in the EU and the Russian Federation, $\leq 2\%$ of all protected forest areas receive the most restrictive status of no active intervention [21]. Consideration of human well-being in conservation decisions does not require a radical departure from current practices. The NCS position, however, restricts the focus of conservation to the advancement of human well-being, which it frequently

conflates with narrow definitions of economic development (but see [11]), and thereby marginalizes efforts to preserve diverse and natural ecosystems or to protect nature for esthetic or other non-economic benefits to humans.

Conservation already takes a realistic view of nature's purity and fragility

The NCS argument caricatures the views of conservationists about pristine nature, while making the scientifically unsupportable claim that natural systems are almost infinitely resilient. There are still many relatively undisturbed areas across the globe [17] and although conservationists have long recognized that these areas are not pristine [22], they also recognize that such areas usually harbor far more biodiversity than do urban parks and plantations, a point NCS advocates only sometimes acknowledge [2]. Moreover, conservation scientists have focused at least as much on nature's resilience as its fragility (Table S2 in the supplemental material online). Although many environmental harms can indeed be ameliorated or reversed, others are virtually irreversible (e.g., extinction, climate change, mountaintop removal).

Past conservation has not been a failure

The NCS claim that contemporary conservation has failed is overly simplistic, if not directly misleading. First, it ignores how the creation of parks, innovative resource management regimens, and other conservation work has slowed the pace of biodiversity decline. Although it is difficult to quantify averted declines and extinctions, several recent studies have concluded that, if the conservation community had not been trying for decades to protect land and water resources and biodiversity, losses would have been far greater than they have been to date [23–26]. Second, it ignores the creation of legislation and public support for nature conservation that set the stage for arguments over conservation and development [27,28]; the need to weigh tradeoffs between conservation impacts and economic gains is a central legacy of the conservation movement.

NCS approaches are a dubious fix for conservation's shortcomings

NCS advocates argue that the failure of past conservation efforts to halt biodiversity decline and resource degradation supports a shift toward markedly more human-centered approaches to conservation. However, there is little basis for the assertion that a more narrow, anthropocentric conservation strategy would deliver better results, especially given the track record of poor management of natural resources in the past, including management of the parts of nature we economically value the most [29,30]. In addition, the NCS assertion that focusing on ecosystem services will save biodiversity as well ('the fate of nature and that of humans are deeply intertwined...many of the activities that harm biodiversity also harm human well-being' [5]) has essentially no rigorous scientific support [31,32]. Finally, the claim that NCS will be more effective than contemporary conservation relies on altering the primary goal of conservation from saving species and ecosystems to that of saving only those components of nature that

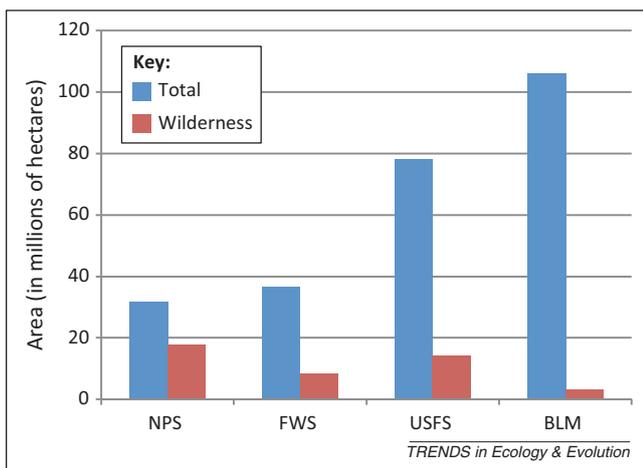


Figure 1. The areas of major US federal land holdings with some mandated conservation role, illustrating that generation of services for humans is already emphasized far more than biodiversity protection. Lands are arranged from those most devoted to biodiversity conservation (as well as tourism), under the jurisdiction of the National Park Service (NPS), to those least devoted to biodiversity and most to resource extraction and other human uses, under the Bureau of Land Management (BLM). In between are lands managed by the Fish and Wildlife Service (FWS) and the US Forest Service (USFS). Red bars show the acreage in designated wilderness areas, which account for 17% of all these lands. Wilderness is primarily managed for the protection of nature for its own sake, but also has considerable tourism value.

directly benefit people: 'Some human-caused extinctions are inevitable, and we must be realistic about what we can and cannot accomplish. We must be sure to first conserve ecosystems in places where biodiversity delivers services to people in need' [5].

The priorities of NCS rest on ethical values, not science Although NCS advocates contend that their approach is science-based and aimed at more efficient conservation outcomes, their remedies appear to be primarily grounded in an assumption that human welfare should be granted a higher moral priority than the protection of species and ecological processes (Table S3 in the supplementary material online). Therefore, they argue that conservation should be done for the sake of human well-being, which NCS often equates with business interests and economic prosperity [10]. Thus, these advocates urge the substitution of a human-centered ethical commitment for the one that has long motivated many conservationists – that other species and nature as a whole have a right to continued existence – and do so under the guise of scientific objectivity.

Most worryingly, NCS's rationale that to be effective and forward thinking, conservation should more directly and narrowly serve human interests is based on dubious evidence. First, NCS advocates argue that conservationists have sacrificed indigenous groups to form parks. Although the establishment of protected areas has sometimes hampered local livelihoods and created conservation refugees [33], widespread efforts have been under way to address this for three decades [6,34]. Indigenous groups and conservationists have also frequently formed alliances to protect lands and counter extractive industries [6]. Further, local and indigenous peoples often receive multiple, tangible benefits from well-designed protected areas (e.g., [35]). Finally, a recent, extensive survey of development and conservation professionals revealed a broad consensus that biodiversity conservation and poverty alleviation are generally positively linked, whereas countervailing minority positions have polarized the debate [36]. Altogether, the evidence shows that biodiversity-motivated conservation can be compatible with rights of indigenous groups and that the motivation of preserving nature for its own sake does not need to be thrown aside to achieve both goals.

Advocates of NCS also argue – both as a matter of efficacy and as a matter of principle – that conservation should partner with, rather than impede, business. Although groups with competing interests can negotiate agreements – and should certainly do so when it is truly beneficial – it is rarely possible to identify solutions that maximize both economic and ecological benefits, as NCS advocates propose [34]. Nor is it clear that giving up on conservation's core goals is the best way to reach compromise with those who may have legitimate, but mostly non-congruent, objectives. We cannot speak effectively on behalf of the natural world if at the outset we prioritize corporate and other human interests. NCS proponents also downplay evidence that corporations have done vast harm to lands and people through resource extraction [37], that recent efforts to 'green' business through environmentally responsible practices have

often failed to reduce pollution or biodiversity losses [38,39], and that indigenous rights groups view the 'green economy' as a cultural and ecological threat; for example, the declaration of 500 indigenous groups at the Rio+20 UN Conference on Sustainable Development states: 'The "Green Economy" promises to eradicate poverty but in fact will only favor and respond to multinational enterprises and capitalism.' (See <http://www.ienearth.org/docs/DECLARATION-of-KARI-OCA-2-Eng.pdf> and Table S2 in the supplementary material online.)

Economic motivations are not always dominant, nor are moral values always weak or immutable

NCS proponents implicitly assume that people's core motivations are deeply self-serving and thus that economic self-interest is the most potent motivator, but a great deal of research shows that social and moral factors strongly shape behavior and support for policies, often outweighing direct economic self-interest (e.g., [40,41]). This conclusion is borne out by even a cursory look at the long history of conservation successes. Most national and international conservation laws have garnered strong support at least in part by appeals to non-economic, ethical principles [e.g., Migratory Bird Act, US Endangered Species Act, Canadian Species at Risk Act, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Wilderness Act, Clean Water Act]. Moral arguments are also the way to build alliances across broad coalitions of different constituencies, including those motivated by both social and ecological issues [32]. The stance that conservation progress should be driven by transient economic preferences rather than enduring values also hampers recognition of the possibility or even the need for structural and institutional changes to achieve and sustain conservation objectives. Finally, the assumption, and hence reinforcement, of only economic motivations for conservation ignores and may thus diminish the importance of political, scientific, philosophical, and religious motivations for conservation found across different nations and cultures [42–44].

Recent polling in the USA also shows evidence that the public's concern for nature is not weakening nor is support limited to the wealthy, white population (e.g., Figure 2). Polls find that there is equal or greater support for moral versus human-use arguments for conservation [9,45] and that Hispanics, women, and young voters are currently among those most concerned with various conservation goals, which include protecting America's air and water, wildlife, and other natural resources, as well as confronting climate change (see [46,48]).

NCS proponents also implicitly assume that ethical stances are resistant to change and thus conservation must refashion its message to better appeal to those who are apathetic or opposed to the goals of protecting species and ecosystems. However, innumerable social and environmental justice campaigns have shown that ethical views can be swayed, often very rapidly. Indeed, most successful efforts to win public support for a cause have focused on influencing notions of right and wrong, even if they are combined with multiple other motivations. Slavery was not outlawed in the USA solely because abolition favored the

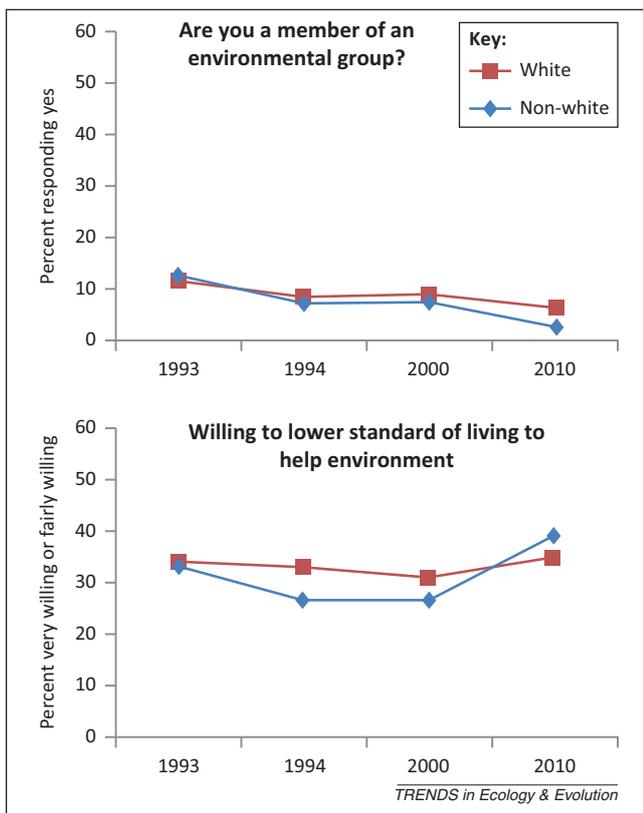


Figure 2. Long-term polling data [51] of adults over 18 living in households in the USA indicate complicated patterns of support for environmental issues across racial and other divides through time, with limited indication of declining support and no indication of a strong racial divide. (A) Membership in environmental groups has shown recent declines, but (B) stated willingness to sacrifice quality of life for the sake of the environment has not declined and might have risen for non-whites. Note that these polls were administered only in the years shown.

interests of northern manufacturers over southern plantation owners [49]; nor is the lack of complete success in eliminating slavery worldwide – to this day – a reason to conclude that the moral justification against this practice has ‘failed’ or should be replaced with an economic efficiency argument. Recent campaigns over other human-rights issues (e.g., same-sex marriage), animal welfare, and conservation itself all show that beliefs and priorities are powerful motivators and that they can be altered, often with great speed.

Concluding remarks

Conservation policies and strategies cannot stand still or dwell in the past. The profound and increasing pressures on our natural systems demand that conservationists critically review their goals and approaches and seek ever more effective ways of improving the outlook for all natural ecosystems. Likewise, we have no argument with the goal of meeting human needs, especially those of the poor. In some settings, joint economic development and conservation programs might be an important and cost-effective means to meet the dual goals of human betterment and environmental conservation [8]. However, the congruence of these different goals in some cases does not mean that conservation of biodiversity has to perpetually take a back seat to the betterment of human welfare.

The remedies that follow from NCS’s critique of contemporary conservation’s track record rest on the assumptions and the values of its authors, not analysis and facts. Conservation has long been concerned both with sustaining human resource needs and with conserving nature’s intrinsic value – the right of species and other aspects of nature to exist for their own sake [8]. Rather than adding to the conservation toolbox, NCS seeks to shrink the range of conservation activities, and especially motivations, that are considered legitimate. That advocates of NCS denigrate much past and contemporary conservation work is of real concern, especially given evidence that broad coalitions are most effective at bringing about social change [50]. By the logic of NCS, conservationists should abandon many of the objectives that have motivated generations of activists and scientists. Faithfully following NCS prescriptions would also suggest that conservationists withdraw their support for environmental legislation that seeks to protect rare species, and biodiversity in general, and that they dramatically transform the practices of conservation non-governmental organizations (NGOs).

We do not believe that it is quixotic, misanthropic, or short-sighted to protect nature based on its own value. Moreover, we acknowledge that this position is a statement of values and hope that, as the NCS debate continues, all parties will be clear about where the science of their arguments stops and starts. If the mission of conservation becomes first and foremost the promotion of human welfare, who will work for the protection and restoration of the rest of nature – for desert tortoises, Delta smelts, Hawaiian monk seals, vernal pool invertebrates, and the many other parts of the natural world that do not directly benefit humans and in some cases do demonstrable harm to immediate, economic welfare? Also, we wonder why donors should be generous to such NCS-motivated groups. For those who care about preserving and restoring ecologically rich natural areas, the NCS agenda has little appeal. For donors whose foremost concern is human welfare, groups like Save the Children, Oxfam, and Water for People already, and more explicitly and effectively, embrace the same values of human betterment, including environmental efforts that serve these goals.

NCS advocates argue that traditional conservation is despairing and negative [1,2], but, pared down to its essence, their solution seems far more so: give up your original goals and focus only on a single species – humans. There are now unprecedented demands on natural resources across the globe, and there will never be a shortage of advocates for human use of these resources. The question is whether conservation scientists and practitioners should make promoting economic prosperity their primary mission as well. As conservationists are already acutely aware, the effects of human industry are felt throughout the world, and we must plan conservation strategies that address coupled human and ecological dynamics. However, refashioning conservation into a set of goals that primarily advance human interests means selling nature down the river, serving neither the long-term interests of people nor the rest of the species with which we share this planet.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.tree.2013.10.013>.

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