

Fact and Value in Ethically-Driven Sciences

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Most sciences are principally concerned with discovering and explaining new truths. But some sciences pursue more immediately pressing and plainly ethical goals. Examples include improving health, conserving biodiversity, and solving other societal problems. Non-epistemic values seem to permeate these ethically-driven sciences. This perception has recently encouraged the view that they are value-laden in a strong sense: both ethical values and non-normative facts factor indispensably in these sciences, and their respective contributions cannot be clearly demarcated. In fact, the inextricable suffusion of value has even been taken to challenge the cogency of a fact-value distinction. Such claims are overstated. Ethically-driven sciences are best conceptualized as conditionalized endeavors. Achieving ethically valued objectives dictates some of their structure, but this influence can be clearly demarcated from the factual status of claims made within them. The conditional nature of ethically-driven sciences grounds this delineation and reaffirms the fact-value distinction remains distinct.

The wilderness and the sown in the Land of Israel: Historical mapping, the human footprint and remote sensing

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The distinction between the wilderness and the sown land, can correspond to the conflict between nomadic people and settled people, and is a prism through which I want to explore changing views of nature and wilderness. As a geographer interested in using spatial analysis to examine environmental changes and human impacts on the landscape, I will present in my talk three approaches for understanding the wilderness in general, and within the Land of Israel, in particular: the limits of the settled land as shown in historical maps, the global mapping of the human footprint, and remote sensing. During the 19th century there was a renewed interest in the Holy Land by the European and the Christian world. On the British PEF map (1871-1877), all settled villages and towns are clearly shown, and apart from the coastal plain, there were almost no fixed settlements south of the 300 mm/year isohyet. This distinction between the settled land and the grazing grounds of Bedouins in the northern Negev Desert was explicitly mapped on the historical maps of European cartographers in the late 19th and early 20th centuries. Later on, F.J. Salmon, who was one of the directors of the Survey of Palestine during the British Mandate time, wrote that the topographic maps of Palestine should be able to ‘distinguish between the desert from the sown’. Roderick Nash opens his seminal book (1967), ‘Wilderness and the American Mind’, with a philosophical discussion on the meaning of wilderness, suggesting that the term derives from ‘wild-deor’, i.e. where wild animals roam. The first global mapping of wilderness areas has been explicitly done by Eric Sanderson from the Wildlife Conservation Society in 2002. Compiling a set of global datasets representing the human footprint (such as population density, roads, night lights etc.), the remaining wilderness areas of Earth have been mapped as those areas with the least cumulative score of human footprint. Within this mapping, grazing areas are usually not considered as wilderness. As the ancient Greek Heraclitus is often quoted, “Change is the only constant”, and nowadays, remote sensing via satellites allows us to monitor global changes in land cover and land use in general, and the dynamics of the transition area between settled areas and the more remote less populated areas, such as the Negev and the Judean Deserts. By combining time series of meteorological data and satellite images, the spatial and temporal variability and fluidity of the boundary between the wilderness and the sown becomes apparent.

Philosophy, nature conservation and the general public

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What is the nature that we are conserving? Nature conservation basically focuses on protecting local populations in their natural landscapes and functioning ecosystems.

Why nature deserves conservation? There is no simple answer to this question, yet there are two major types of answers. John Muir led the non-anthropogenic paradigm, claiming that every living creature has its unique intrinsic value, and that there is no reason to go much beyond this explanation to justify conservation. Gifford Pinchot led the anthropocentric paradigm, claiming that we should protect natural resources that are useful to humans and eradicate harmful resources. Leopold led a third paradigm, stating that "a thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise".

What are the threats? There is a simple answer to this question: us. Human actions decimate populations to extinction, so the sources of all threats to nature (habitats destruction and fragmentation, invading species, oversized populations ...) are humans.

How do we conserve? The means used for nature conservation are limited, starting from setting and protecting nature reserves, keeping ecological corridors, regulations and management on invading species, hunting and water use, and a few more. Basically, conservationists set up many rules that separate humans from nature for the sake of conservation, yet, surprised when the people they want so much to serve do not understand them.

The philosophy is not effective in convincing policy makers and the general public, particularly when set of values collide one with the other, and nature conservation values always collide with human needs. Social psychologists suggest circumventing it by trying to merge conservation values to common values in the society, trying to change behaviors and norms rather than values. Social scientists claim that the conservationists deter people by restricting their legitimate activities in the wild, causing disconnection between nature and the people.

Is there right or wrong in this dilemma?

How massive afforestation helps conservation in Mediterranean Israel: mixing ideology, ecology and philosophy

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Nature conservation has been strongly affected by species-oriented approach. The vegetation does not only provide conservation targets but also create the habitat for the conserved community. Therefore, the vegetative formation in open landscapes is an important indicator for management. In nature conservation, the climax (the most developed stage of vegetation dynamics) is supposed to be the most preferred habitat. We attempt to conclude on pre-historic climax in northern Israel by using pollen data. We discuss the processes by which this formation disappeared from the region as well as its partial recovery. We then show that the recovery of oak woodland, on one hand, and the massive afforestation in northern Israel and the colonizing capability of the principle forest species – Aleppo pine, on the other hand, create a sustainable mixed forest, which resembles the pre-historic climax.

We present outcome of various field studies that shed light on the ecological processes behind woodland recovery and the creation of sustainable forest. We introduce the management policies of the agencies managing open landscapes in Israel (KKL and NPA) and stress their disregard of the ecological reality, partly on ideological grounds. We point to recent adaptations (active and passive management) made by the two agencies to reconcile with natural dynamics.

We discuss genetic, ecological and landscape issues that complicate the picture presented above and call for changing the philosophical approach for conservation in Israel based on the local dynamics of nature.

Can conservation of the "human experience" benefit ecosystem conservation? The Ramon Crater International Dark Sky Park

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The Ramon Crater (Maktesh) in the Negev desert is famous for its exceptional quality of a star-studded sky and a natural undisturbed night environment that allows not only the development of a unique ecosystem but also a unique human nighttime experience.

In 2017 the Ramon Crater was designated with the prestigious title "International Dark Sky Park" by the International Dark-Sky Association (IDA). This international title recognizes those sites around the world where the night sky is maintained in its natural state, preserving the unique appearance of a pristine starry night sky, for ecological, astronomical and cultural reasons. At the time of designation, only 54 other nature reserves and parks have been awarded this title in 15 countries around the world, the first in the Middle East region.

During the last decade, the Israel Nature & Parks Authority (INPA) has focused on mitigating the ecological effects of light pollution on natural ecosystems, mainly by working together with large infrastructure companies and government regulators on dark-sky friendly lighting solutions in open landscapes throughout Israel.

The designation of the Ramon Crater as an International Dark Sky Park represents a major achievement in raising public awareness in Israel to the negative consequences of light pollution.

The three-year application process included intensive measurements of light pollution within the crater and re-design and implementation of nighttime friendly lighting within campgrounds in the crater. During the process we learned that the magnificent nighttime views available from within the crater, may not only offer a demonstration of successful conservation of the natural ecosystem within the Crater, but also a rare and exceptional human experience on its own, which must be preserved for future generations. This realization, now preserved as an International Dark Sky Park, has turned to be a vision shared by all local stakeholders. Consequently, the nearby town of Mitzpe-Ramon has nearly completed its plans to protect the area's dark skies. During 2018 more than 80 percent of the streetlights were replaced with fully shielded, dark-sky friendly 3000K LED lights. Following this dramatic change, Mitzpe-Ramon residents have also expressed a desire to work toward their own Dark Sky Community designation in the future.

Thus focusing on preserving the human experience has led to the development of new tools in lighting, planning and public awareness, which may clearly also benefit conservation of natural ecosystems conservation. These are implemented today far beyond the walls of the Ramon Crater.

Urban Environmental Ethics: From 'wild' to 'urban' socio-ecological selfhood

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The paper offers a philosophical model of socio-ecological selfhood that raises ethical considerations regarding nature conservation, and their associated sociopolitical aspects, in cities.

The Ecological Self is one of the central concepts in environmental ethics and philosophy. This concept contends that humans are essentially embedded in the natural world; that the Self is porous and open to the world rather than disengaged and atomistic. In so, this idea is central to non-instrumental valuations of nature and provides moral guidance, justifications, and motivations for nature conservation. However, while emphasizing the affinity between humans and nature, this concept completely overlooks social and political realities. The consequences of this are twofold: First, it generates biases towards cities and urbanism in general (conceived as morally inferior in comparison to life closer to nature). Second, overlooking social and political realities also implies neglecting the full range of considerations found between the self and nature.

The reformulation of this concept leads to an alternative, holistic and extended model of 'socio-ecological selfhood'. This model is inspired by the works of the artist and environmental activist Friedensreich Hundertwasser (1928-2000) - a prominent Jewish-Austrian artist and environmental activist; yet despite his commitment to environmental issues, he has not received the attention he deserves from the environmental ethics community. The suggested notion of 'socio-ecological selfhood' implies that humans are embedded in the natural world, however, this embedment is mediated by needs and wants, architecture and spatial existence, social and political institutions, and urban life.

Designating Conservation Priorities along the Urban – Nature Gradient

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A central tenet of conservation biology is preventing species extinction. In theory, ecologists carry in their toolboxes a collection of objective tools enabling them to assess, for example, population dynamics of different species, identify diversity hotspots, delineate dispersal corridors, and other conservation related objects or objectives to protect species. In practice, however, nature conservation decisions do not necessarily reflect the “theoretical best practices”. Pressures to manage wildlife or ‘natural’ populations, is a function of two broad categories: 1) The state of the species, e.g., populations’ sizes or trajectories, and 2) Cultural/societal perceptions of the target species. Given the presumption that the ultimate goal of conservation biology is to protect species and not individuals, managers may resort to culling individuals or their translocation.

Conflicts between humans and wildlife require active management actions to alleviate them, targeting individuals or populations. Clearly, natural areas provide the optimal settings to conserve natural and native species. In contrast, in urban areas the overriding goal is to maximize human wellbeing. In such cases, control of wildlife populations is a necessity, as to achieve these goals. Between these two extreme land uses, lies a continuum of anthropogenic impacts and pressure on the open areas. Thus, if at the one end conservation of wildlife or native species are prioritized, while at the other end human wellbeing is prioritized, what should happen in the middle grounds?

The different land uses are not strictly delineated by impermeable boundaries. Rather, nutrients, energy and individuals transition across the mosaic of land-uses. Thus I argue that management goals in urban areas cannot be set independently of goals set in ‘natural’ areas. Wildlife populations of a given species, and essentially meta-populations should be viewed as a single entity to be managed. The tools to manage the populations, however, may vary from land use to land use. Currently, the predominant tools applied are culling of individuals or translocations, coupled with sanitation practices. Given that in agricultural areas wildlife activities result in direct physical damage to crops and infrastructure, culling specific individuals, the ones causing the damage, may yield temporary relief for the farmers. In urban areas, where the mere presence of wildlife may impact the residents’ wellbeing, culling or removal of individuals will not yield relief. Thus, in such settings sanitation practices should be prioritized in the short term. To alleviate human-wildlife conflicts in the long-term, various management practices should be applied conjointly with education of the public.

The ethics of de-extinction

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“de-extinction” refers to the process of resurrecting extinct species by genetic methods. This science-fiction-sounding idea is in fact already in early processes of scientific implementation. The prospect of the “revival of the dead” raises deep ethical questions, which the ethics of de-extinction has only started to grapple with. This paper does not seek a verdict for or against de-extinction, but rather attempts an overview and some novel analyses of the main ethical considerations. Five dimensions of the ethics of de-extinction are explored: (a) the possible contribution of de-extinction to promoting ecological values, (b) the deontological argument that we owe de-extinction to species we rendered extinct, (c) the question of “playing God” through de-extinction, (d) the utilitarian perspective, and (e) the role of aesthetic considerations in the ethics of de-extinction. A general feature arising from this analysis is that, due to de-extinction’s special character, it repeatedly tests the limits of our ethical notions.

Which ideas do scientists think are most useful for conservation? A brief tour of selected conceptual frameworks in conservation social science

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The recently-completed Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) report is the most comprehensive study to date on the decline in global biodiversity. The report delivers a clear message - as many as one million plant and animal species are now at risk of extinction and that fact presents clear threats to human civilization. The report also emphasizes the importance of an ‘all hands on deck’ approach to addressing these urgent challenges. This talk will explore the underlying conceptual frameworks used by the authors of this report, natural and social scientists working at the nexus of science, policy, and practice. These scholars often advocate a transdisciplinary approach to science, and use an ecosystem services approach that assesses the value of ecological services to human societies.

The ecosystem services approach arose simultaneously with the study of “coupled social-ecological systems,” the idea that ecological systems and human societies are inherently interconnected and should therefore be studied in an integrated manner. This idea branched into various fields (e.g. sustainability studies, global change research, and social ecology). Collectively, these fields have given rise to several conceptual frameworks that provide a foundation for transdisciplinary communication, research, and decision-making by scientists, land managers, decision makers, and other stakeholders.

This lecture will briefly review several conceptual frameworks that have been, increasingly adopted by conservation science. The focus will be on transdisciplinarity, the branching field of social ecology, and the benefits and shortcomings of ecosystem services assessment. Finally, the talk will explain how these ideas underpin the IPBES Global Assessment, and what this might mean for communicating and taking action on global change threatening human societies.

Anthropocentrism and the role of the ecosystem services framework in environmental protection and conservation: a literature review

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The concept of ecosystem services has gained great popularity in the environmental science and policy literature, becoming a dominant approach for promoting environmental conservation. The concept was first developed to heighten awareness about the dependence of the human system on ecosystems and to bolster environmental conservation. Despite the proliferation of studies, it remains unclear precisely how the ecosystem services framework contributes to environmental conservation in practice. This uncertainty might also be one cause of its low reported impact on real world decision making. There is thus the need to clearly state and justify what and how a primarily anthropocentric approach adds to traditional biological conservation, and what are its strengths and limitations.

We reviewed 94 papers selected through a search of the web of science based on the following keywords: “ecosystem services”, “environmental protection” and “conservation”. The review analysis empirical case studies to identify the multiple contributions of the ecosystem services framework to the ecological, social and economic dimensions of conservation. We identify 15 main categories of contributions. It appears that these mainly aim at defining, integrating and strengthening the human dimension (i.e. human needs and wants) in conservation projects. The framework, instead, appears to be less suitable to convey ecological knowledge and biocentric values.

These results suggest that ecosystems service assessments have great potential for constructively embedding socio-economic and cultural values in biodiversity conservation efforts, a dimension which is often overlooked. This neglect has proven to undermine conservation efforts in the past. Therefore, despite being criticized for being anthropocentric, the framework fills an important gap in conservation efforts, that of incorporating human, social and economic values, towards a more comprehensive and potentially successful conservation processes and outcomes.

These results are supported by previous research which suggested that areas for environmental protection should be prioritized based separately on biodiversity and on ecosystem services considerations. We suggest that these should be two layers of the decision-making process which need to be reconciled. As expressed by the Ecological Economics framework, we also add that ecological considerations should be given precedence over social and then economic ones to achieve sustainability. We conclude that the integration of the human dimension in conservation efforts is central and is particularly well addressed by the application of the ecosystem services framework.

Conservation biologists: curators or caretakers?

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Although it is the ultimate currency by which ecosystems are assessed, the meaning of ‘Nature’/‘Natural’ in conservation is still being debated. While there appears to be a consensus regarding what constitutes an unnatural action: namely - anthropogenic mechanized interference with an ecosystem using external energy sources, there are various views as to what constitutes an unnatural reaction (ecosystem). These can be classified in one of two groups commonly viewed as competing approaches: (1) A compositionistic (state oriented) approach prioritizing biodiversity. Under this notion, an ecosystem is natural when all of its original components are present and the system ‘looks like’ some pre-determined benchmark. This conforms to the concept of integrity. (2) A functionalistic (process oriented) approach, prioritizes processes free of human intervention. In this case, a disrupted system is considered to have recovered its full naturalness when all original functions have been reestablished (also a form of benchmarking), but its independence of anthropogenic disturbance (autonomy) is considered as well. The existence of two different perceptions of Naturalness, on one hand, appears to be tolerated due to the false impression that both are tightly coupled, i.e. a system containing all components will function properly and vice-versa, while on the other hand the approaches do come into conflict and are thus mutually exclusive; for example, when the integrity of an ecosystem is maintained by un-natural (mechanized) action. Such inconsistency hampers priority-setting and decision-making. Furthermore, both rely heavily on benchmarking which is essentially a curator approach (“let’s make the system look like...”) that disregards the inherent dynamics of natural ecosystem. I propose an alternative, more operative, framework for evaluating naturalness that, instead of the process-state dichotomy, is temporally-framed around past-, present-, and future-related components. Specifically, the **past** is a benchmark, state-based approach that compares past biodiversity and processes with the current conditions and is measured by integrity; the **present** focuses on the autonomicity of the system (an autonomic system is that in which current processes and trajectories are not subject to present mechanized human influences) and is measured by the level of anthropogenic investment in maintaining the system at its current state; and the **future** is prognostic procedure considering both integrity and autonomy. This approach decouples the state-based (past) from the process based (present) so that they become complimentary rather than competing. Specifically, in this framework, a system can have all its original components (100% integrity) yet be relatively un-natural because it is presently sustained or disturbed (not autonomous) by anthropogenic activity (e.g. a reserve where certain populations need to be fed). Alternatively, a system may have only partial integrity, but yet be autonomous of human intervention (e.g. a recovering abandoned agricultural field or a nature reserve with an extinct top predator). This framework dampens the problems associated with benchmarking by making it one of three components of assessing naturalness. These components are logically prioritized from securing the future> mitigating the present> reconstructing the past.

Why ecologists talk the talk, but don't walk the walk

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In conservation biology courses, including the one given in this institution, the field of conservation biology is defined as an applied science, with the distinct aim of providing a knowledge base to achieve a certain environmental goal. The way to do so runs in the fundamental connection between ecologists, as experts in their field, and policy makers. However today, as a rule, decades after the influential works of Rachel Carson (*Silent spring*, 1962), Aldo Leopold (*A sand county almanac*, 1949) and Paul Ehrlich (*The population bomb*, 1971), most ecologists avoid advocacy on environmental issues. Some of their reasons for doing so are the belief advocacy conflicts in some ways with science (such as scientific 'neutrality'), possible compromise of their scientific as well as public credibility, and perceived negative personal and professional costs. Reasons argued in favor of advocacy by ecologists include the inherent resemblance of conservation biology and advocacy, the dangers of abandoning the political ground to other interest groups, and the role of nature conservation scientists as citizens in their communities. The examination of each premise, followed by a discussion between symposium participants could hopefully aid in shaping both their ethical reasoning and framework for public action.