

## **WHAT IS A NATURAL AREA?**

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**ABSTRACT:** Naturalness is a concept central to natural areas management and conservation. Its usefulness, however, depends on how it is defined and measured. Defining “natural” to include harmonious human influence has important practical and philosophical advantages over alternative no-human-influence usage. The role of management depends on the kind of natural area -- historic, cultivated, pristine, recovered wild, candidate wild, or anthropogenic. Management for naturalness can be assessed by a set of proposed indices involving populations, species, communities, ecosystems, landscapes, and human behavior.

Qué es un Área Natural?

**RESUMEN:** Naturalidad es un concepto central al manejo y conservación de áreas naturales. Su utilidad, no obstante, depende de cómo se defina y mida. Definir “natural” para incluir influencias humanas armoniosas tiene ventajas prácticas y filosóficas importantes sobre la alternativa de no influencias de uso humanas. El rol de manejo depende del tipo de área natural, histórica, cultivada, prístina, “naturalmente” recuperada, candidato a salvaje (“candidate wild”), o antropogénica. El manejo de naturalidad puede ser tasado por un grupo de índice propuesto involucrando poblaciones, especies, comunidades, ecosistemas, paisajes y conducta humana.

*Index terms:* conservation concepts, naturalness, natural areas management, natural indicators

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## **INTRODUCTION**

Natural area managers often struggle with the concept of “natural.” For example: Should exotic species have a place or not? What should be done, if anything, when keystone species like white-tailed deer (*Odocoileus virginianus* Zimmerman) and beaver (*Castor canadensis* Kuhl) become very abundant? In restoring degraded areas, what if recovery to pre-settlement conditions is not possible? More broadly, should naturalness be the goal, and if so, what does it mean and what management strategies work best to achieve it?

This paper examines naturalness as a core principle for conservation, suggests management indices for it, and provides a lexicon of areas that qualify as being natural.

Its purpose is to encourage further discussion of a pivotal concept for both natural areas management and conservation.

## NO HUMAN INFLUENCE

Some conservationist biologists have urged that naturalness be narrowly defined to mean without human influence (Anderson 1991, Hunter 1996, Angermeier 2000). This usage it is said provides a clear reference point for evaluating conservation efforts. Deviation from the natural condition can be measured by indices such as the amount of human energy expended to change an original ecosystem, and by the number of native species lost from an area since European settlement. Hunter (1996), however, suggested that pre-industrial human impacts and resulting ecological conditions should not be considered natural because they were often substantial (e.g., the role of early Americans in extinguishing large mammals during the late Pleistocene). The use of conditions just prior to European settlement as natural benchmarks would then seem appropriate: If Native American populations were decimated by diseases spread by early explorers prior to 1600, wildlife populations may have rallied to generate “wilderness” that endured until the heavy hand of European settlement (ca. 1850) (Geist 1996).

There are major practical and philosophical problems with the no-human-influence definition of natural. Among them:

- \* Pre-settlement ecological conditions are difficult to ascertain, and, in any case, their use as natural benchmarks is problematic given that most ecosystems are not in long-term equilibrium (Sprugel 1991). Moreover, distinguishing past human and non-human effects on ecosystems is often impossible.

- \* Actively managed areas are by definition less natural (and surely to some people therefore of less value) even though they may enhance biodiversity or better resemble pristine ecosystems. The same can be said about endangered species recovery by means such as captive breeding and reintroduction, thereby fueling arguments by those who oppose such conservation. In a similar vein, land stewards, nature gardeners, and others who alter or actively manage local habitats to benefit birds and other wildlife face the dilemma of making them less natural.

- \* Defining natural to mean without humans undercuts philosophical foundations of modern conservation. The people-as-part-of-nature concept is integral (at least implicitly) to many perspectives dear to conservationists. These include the land ethic (Leopold 1949); deep ecology (Devall and Sessions 1985); Native spirituality (Suzuki and Knudtson 1992); Franciscanism (White 1967); community-based conservation (Western and Wright, eds. 1994), ecosystem management (Cortner et al. 1999); and gaia (Volk 1998) and biophilia (Wilson 1984) hypotheses.

- \* The conceptual separation of people from nature perpetuates reductionism, and promotes alienation, isolation, and disconnectedness (Bekoff 2000). It exacerbates the

humans versus nature split. When people are mentally and spiritually divorced from nature, are they less likely to respect and defend it?

\* The term “natural” becomes anachronistic (McKibben 1989, Soulé 1990). It implies a desired condition that today is virtually impossible to attain. If we lose naturalness as the basis for conservation, what will replace it?

Reasoning that naturalness is a relative, not absolute, concept, one might be tempted to manage a natural area for the least amount of human influence and leave it at that. This commonly-adopted approach is especially flawed when there are no clear criteria distinguishing natural from artificial. Without principled criteria, almost anything can be rationalized on “practical” grounds and in deference to economic interests (e.g., commercial visitor complexes in national parks).

## HARMONIOUS INFLUENCE

The word “natural” offers far more meaning for conservation when it includes human influence that is *ecologically harmonious*. This usage recognizes that the divide between natural and artificial is not people, culture, or even technology per se, but rather their influence when it overwhelms the biota and supporting organic processes (Povilitis 2001). Areas with human influence merit the label “natural” when people do the right things in terms of biodiversity, ecological health, and environmental sustainability.

In an evolutionary sense, humans are natural regardless of their behavior (Haila 1999). However, in an ecological context what *can* propel them out of nature’s ambit are the combined powers of abstract reasoning and overwhelming means of destruction. Conversely, humans can, by choice, refrain from actions that are harmful to the survival and evolution of the greater community of life. When doing so, they avoid the role of conqueror of the biotic community and become a “plain member and citizen of it” (Leopold 1946).

To serve conservation, the people-within-nature concept must be carefully formulated with ecologically-based rules and guidelines. Otherwise, many adverse human impacts on ecosystems could be construed or mistaken as being natural. Lacking such rules, efforts to fuse humans and ecosystems under “sustainable development” appear to have done more harm to nature than good (Soulé 2000).

Toward establishing standards for managed natural areas, a set of indices is proposed (Table 1). Preference is given to native species, namely those with a long history of area residency. Emphasis is placed on species that have declined as a result of human impacts, and especially on endangered species. Under carefully prescribed conditions, an endangered species may be introduced into a natural area outside of its native range in order to help prevent its extinction.

Managed natural areas should support relatively large populations of wildlife within a framework of ecological balance; active management should not be advantageous to

some native species at great expense to others. A corollary is that populations of native species should not be pushed far below carrying capacity (i.e., maximum size that the habitat will support) by human actions (e.g., hunting).

The presence of exotic species which spread widely and out-compete or otherwise harm native wildlife reduces naturalness. An exotic species can be defined as one whose comparatively short historical residency stems directly or indirectly from human actions. In North America, the presence of feral or wild horses (*Equus caballus* Linnaeus) is an arguable case because horses have a substantial history in some areas, their Pleistocene relatives may have been extinguished by humans, and their effects on other wildlife is often unclear.

An area's naturalness can be improved by increasing its size, and the diversity of native communities, especially those that are diminished or threatened regionally. Overall size is important because larger areas will typically rank higher in other indices of naturalness, and because size enhances an area's importance to conservation on a landscape scale. Improved continuity of habitats and reduced "edge effects" will also enhance naturalness when they contribute to conservation of sensitive species or communities.

The naturalness of an area is greater when it is part of a local or regional configuration of habitats (corridor, stepping stone, and matrix habitats) that collectively contribute to biodiversity conservation. Similarly, naturalness can be improved through measures that provide habitat for native plants and animals that are dispersing or migrating, and habitat to help support wildlife metapopulations (i.e., populations of separate units connected by dispersing individuals).

Active management can heighten ecosystem sustainability in terms of biotic composition, physical structure, and ecological function without reducing naturalness. Examples include measures to reduce soil erosion and enhance soil building processes. The sustainability index is not meant to imply that ecosystems are static, but rather that human-induced change must be generously paced to allow the biota time to adapt and evolve.

Human activities that adversely effect the environment should be eliminated from natural areas (there is no better way to demonstrate to the public the "dos and don't" of naturalness!). These activities include use of fossil fuels (the major cause of potentially catastrophic climate change) and nuclear power (with incalculable risks to the biosphere, particularly from radioactive waste). Conversely, an area's naturalness can be improved through energy conservation, use of passive solar power, and by substituting renewable (e.g., wind and biomass) for non-renewable energy sources.

Air and water pollution, and the presence of non-recyclable products will diminish an area's naturalness, as will human suppression of normal ecological disturbances, such as lightning caused wildfire and periodic flooding of stream channels. Such disturbances are essential for the creation, enhancement, and maintenance of certain wildlife habitats. On the other hand, the naturalness of an area can be improved by avoiding or minimizing

roads, fencing, outdoor lighting, pesticides, other synthetic chemicals, and other materials and structures that may harm wildlife.

In general, naturalness is degraded by commercial and outdoor activities unrelated to ecological and conservation themes. This is because most of these activities today have harmful effects on local or global environments, or promote lifestyles inimical to nature. Conversely, a natural area's value can be enhanced by its contribution to human appreciation and respect for wildlife, and for ecological and evolutionary processes upon which all life depends.

## KINDS OF NATURAL AREAS

If people are to be part of nature, their appropriate role in varying ecological contexts must be clear. For instance, the human role will be quite different in a remote wilderness area as compared to an organic farm or city park. Table 2 lists types of natural areas that differ in this regard. While each category has unique conservation value (a notion that runs counter to the idea that less human influence is always best), the rarest kinds in each ecological region should be of highest conservation priority (normally, this would be pristine and recovered wild areas).

Managed natural areas, the focus of this paper, depend on active manipulation of ecosystem components, structures, or processes. *Historic natural areas* are managed to conserve species and communities in ways that reflect prior ecological conditions. *Cultivated natural areas* involve creating or improving wildlife habitat without direct reference to their past ecology. *Candidate wild areas* are actively managed for recovery to a desired unmanaged condition. They are typically large areas whose ecosystems have been altered by past human abuse.

Unmanaged natural areas lack manipulation of the environment by people. *Pristine areas* are those that have not been significantly altered by human settlement, while *recovered wild areas* resemble ecological conditions believed to exist prior to human settlement. *Anthropogenic natural areas* have been clearly shaped by humans, and cannot be recovered to pre-existing ecological conditions (because of factors such as small size, control of fire, and impacts that have changed hydrology, soils, etc.). Attempts at managing them would arbitrarily alter one wildlife population or ecosystem factor to the detriment or diminution of others. Control of exotic species and conservation of many endangered species and communities is not possible within anthropogenic areas. Being "self-directed," unmanaged natural areas are comparatively inexpensive to maintain. They can be valuable benchmarks for natural areas management by virtue of their being either without significant human influence, or with irreversible human influence resulting in ecosystem reassembly.

## BIOLOGICAL INTEGRITY AND NATURALNESS

In recent years, "biological integrity" has gained prominence as a conservation concept (Angermeier and Karr 1994, Callicott, et al. 1999, Westra et al. 2000). It refers to

ecological capacity (in terms of composition, structure, function) comparable to that expected under conditions with little or no human influence. By contrast, “naturalness,” as defined in this article, suggests that areas which deviate from the pristine can have integrity in their own right (e.g., historic, cultivated, and anthropogenic natural areas). With “natural integrity,” distinguishing between conditions arising from human actions and non-human events is not as vital. What is paramount is the distinction between destructive and wholesome human behavior in ecosystems.

Naturalness as a conservation imperative requires that many areas be managed for biological integrity within each region. It acknowledges that in general “nature knows best” (a notion reflected in the indices of Table 1).

Some conservationists may argue that, unlike more technical terms such as “biological integrity,” there is little point in attempting to standardize the meaning of “natural” for conservation usage. After all, we know what must be done to restore the biosphere, so let us just get on with it. However, consider this: the frequent use and positive meaning of “natural” in everyday life is what makes it such a potentially powerful tool for conservation. We should use this banner word, so integral to conservation practice, to full advantage.

#### ACKNOWLEDGEMENTS

This work was sponsored by Life Net, a nonprofit organization dedicated to wildlife conservation and education. I am grateful to members of the *Natural Areas Journal* Editorial Board for help review and comments.

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Table 1. Some key management indices making an area more (>) or less (<) natural.

Populations, Species, and Communities

- > native species
- > viability of endangered species
- > native communities
- > representative and threatened communities
- < exotic species (invasive)

Ecosystems and Landscapes

- > size (physical area)
- > connectivity of native habitats (clustering, corridors, buffer zones)
- > role in consolidating native habitats locally and regionally
- > role as stepping-stone and archipelago (metapopulation) habitat
- > ecosystem sustainability
- < edge effects harmful to endangered or sensitive species
- < fragmentation of habitat

Human Behavior

- < fossil fuel and nuclear energy
  - < materials and structures which harm wildlife
  - < air and water pollution
  - < non-recycled products
  - < suppression of ecological disturbances important to wildlife habitat
  - < commercial activity unrelated to the natural area and its conservation
  - > role in conservation learning, nature appreciation, and stewardship
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Table 2. Kinds of natural areas.

<u>Type</u>	<u>Management Policy</u>
Historic	ongoing management, such as use of prescribed burns and control of exotic species; e.g. Illinois woodland preserve managed for shade-intolerant oaks and native understory plants (Laatsch and Anderson 2000)
Cultivated	ongoing management, such as use of nest boxes, plantings of vegetation as food or cover for wildlife, impoundments for waterfowl; e.g. many national wildlife refuges (Gergely et al. 2000)
Candidate wild	restoration management; e.g. parts of Bandelier National Monument (Sydoriak et al. 2000) where dense pinyon-juniper communities are thinned and treated with organic ground cover to remedy ecosystem alteration from livestock overgrazing and fire suppression.
Pristine	little or no human influence; e.g. the Arctic National Wildlife Refuge
Recovered wild	little or no human influence; portions of Yellowstone National Park after restoration of extirpated species like the grey wolf
Anthropogenic wild	no active management; e.g., unmanaged Illinois forest preserves (Laatsch and Anderson 2000)