Chapter 2

The Trouble with Naturalness: Rethinking Park and Wilderness Goals

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> Words can assume quite different meanings as time passes, as context changes, or even as they are spoken by different people. In resource management, the interpretation of a few key phrases has caused and continues to cause untold havoc.
>
> —*Luna Leopold*

Naturalness, more commonly phrased as "natural conditions," appears as a guiding concept throughout protected area policy. The National Park Service Organic Act of 1916 declared that the fundamental purpose of the parks was "to conserve the scenery and the natural and historic objects and the wild life therein . . . unimpaired for the enjoyment of future generations." Historian Richard Sellars (1997) argues that the provision that parks remain "unimpaired" was "essentially synonymous" with maintaining natural conditions, a contention supported by interior secretary Franklin Lane's instruction to the first director of the National Park Service: "Every activity of the Service is subordinate to the duties imposed upon it to faithfully preserve the parks for posterity in essentially their natural state." Subsequent revisions of park management policy have further defined naturalness and made this concept the foundation of park stewardship (National

Park Service 2006). The Wilderness Act of 1964 also codified the centrality of naturalness as an attribute of wilderness character. Wilderness was established "to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas . . . leaving no lands designated for preservation and protection in their natural condition."

The trouble with such heavy reliance on the concept of naturalness is that, like many terms, *natural* is a commonly used word with multiple meanings. When talking about what makes an area natural and how to keep it that way, different people use the term in very different ways and are often not conscious of how their definitions differ. For many people, naturalness implies a lack of human effect. Natural areas should be pristine, uninfluenced by humans, or at least modern technological humans. This means ensuring that the current composition, structure, and functioning of ecosystems are consistent with the conditions that would have prevailed in the absence of humans (either all humans or post-aboriginal ones) (Cole 2000). A place is natural if it is devoid of human artifacts and unaffected by such human threats and activities as pollution and fire suppression.

A related but distinctly different meaning of *naturalness* implies freedom from intentional human control. According to this meaning, an area may bear the mark of human presence, such as shelters and trails, and its ecosystems may have been altered by pollution, invasive species, and other threats; however, it can be a natural area if it is not subject to intentional manipulation and human intervention. In such a place, nature is self-willed, autonomous (Ridder 2007), left to its own devices, and free from the constraints of human intentionality.

Yet another meaning of *naturalness* implies a connection to the past. A natural area is one that is true to the historical condition of the ecosystem. Natural ecosystems should appear and function as they did in the past. This notion of historical fidelity is rooted both in a nostalgic connection to history and in an ethical duty to pass on to the future what was inherited from the past.

When managers face decisions such as those explored in Chapter 1—whether to cut trees in Bandelier or helicopter limestone into the Saint Mary's River to preserve ecological values—the diverse meanings of *naturalness* become entangled. In this chapter we trace how these meanings have evolved, from a time when they were considered to be congruent (by most protected area managers, at least) to the present day, when they are increasingly in conflict. We assert that changes in science and society and the

globalization of human influence have eroded the adequacy of naturalness as a guiding concept for protected area stewardship, the thesis that will set the stage for the remainder of this book.

Early Meanings of *Naturalness*

Any word worth using must have meaning to both the user and the audience. Clearly, by its frequent use, *naturalness*, or more commonly its adjective form, *natural*, meets that test. Every day, people encounter not just natural areas but natural foods, natural athletes, natural gas, and natural history. But what do people really mean when they use the term?

The *American Heritage Dictionary* defines *natural* as "present in or produced by nature; not artificial or man-made," with the etymology rooted in the Latin *natura*, meaning "nature or birth." The same dictionary also provides a relevant definition of *nature* as "the physical world, usually the outdoors, including all living things." Although humans are clearly among "all living things," the traditional counterposition of natural and artificial is an ancient concept and has given rise to a dualistic separation of humans and nature. Even as nature, or the nonhuman world, came to be revered and valued by people, it was viewed as a divine "Other," godlike in its separation from humans (Cronon 1995).

As conservation caught on in the late nineteenth century, nature underwent a transition from Cronon's metaphysical "Other" to very real objects of loss. With the 1854 publication of George Perkins Marsh's *Man and Nature*, the human role in the disappearance of the natural world was formally acknowledged. As Oelschlager (1991: 107) observes, "A careful reading of *Man and Nature* leaves one incredulous, since Marsh marshaled almost irrefragable evidence, spanning an enormous array of activities, that humankind was on balance a destabilizing environmental force whose impacts portended an uncertain future." In the decades that followed, the modern conservation movement was born. As reports returned from the "vanishing frontier" and painters such as Albert Bierstadt decried "The Last of the Buffalo," the first wilderness parks and forest reserves were created to protect at least some of the disappearing, nonhuman natural world.

Here, at the beginning of the twenty-first century, it is hard to imagine the state of natural resources at the end of the nineteenth century. The once inexhaustible bison herds were all but gone, as were waterfowl and a host of other game birds. Forests were being cut and sold without any regard for the future. Natural resource management did not even exist as a profes-

sional field. A century ago, the only way to halt the violence was to draw a line around a place and protect its objects from the commercial onslaught. Preservation of natural conditions was equated with protection from exploitation. For example, when the Ecological Society of America proposed that a national system of nature sanctuaries be established, Shelford (1933: 245) asserted that "remedial measures directed toward the return to a so-called equilibrium consist chiefly in allowing nature to take its course."

Bolstering this sense that maintaining natural conditions could be achieved solely through protection from resource extraction was the prevailing ecological paradigm of the day. Ecology first emerged as a field of study in the latter half of the nineteenth century, but within just a few years, a school of thought was so firmly entrenched that it would guide protected area management for the next half century or more. Climax theory (*sensu* Clements 1916) held that all vegetation was at, or was returning to, a fully developed climax stage of succession that was natural and characteristic of the region. All one needed to do to preserve natural and historical conditions was to avoid disturbances such as logging, grazing, fire, and insect outbreaks. So, for decades after *nature* took on its modern, conservation-oriented meaning, managers and policymakers assumed that nature could be sustained simply by protecting parks from disturbance.

Evolving Ecological Science

By the mid-twentieth century, however, a new set of challenges to nature preservation was being advanced, this time from within the National Park Service. The science of ecology had progressed dramatically, and by the 1930s wildlife biologists surveying the national parks saw "a world of wounds" (sensu Leopold 1953), unraveling ecosystems characterized by wildlife extinctions, feral livestock, and overgrazed plant communities (Sellars 1997). Park Service scientists, led by George Wright, argued that protection from disturbance was inadequate to preserve park values. They asserted that certain types of direct intervention (e.g., elk herd reduction, predator reintroduction) were necessary to preserve natural conditions, whereas other activities that had previously been considered benign (e.g., scenery management and fire, insect, and predator control) diminished naturalness. But this perspective was controversial. Many in the Park Service disagreed, countering that scenery management and fire, insect, and predator control were needed to "preserve natural conditions" in a world that was no longer "in balance" (Sellars 1997).

The controversy waxed and waned throughout the 1940s and 1950s until 1963, when a report authored by A. Starker Leopold and colleagues boldly affirmed the position of the park wildlife biologists. The Leopold report (Leopold et al. 1963: 4) famously asserted that the goal of national park management should be to maintain "biotic associations . . . as nearly as possible in the condition that prevailed when the area was first visited by the white man. A national park should represent a vignette of primitive America." The report recognized that "most biotic communities are in a constant state of change," and maintaining natural ecosystems entails maintaining their dynamics. In many cases, this would entail active management, including herd reduction, prescribed fire, and reintroduction of extirpated species.

Anticipating the advent of restoration ecology by two decades, the Leopold Commission argued, "So far we have not exercised much imagination or ingenuity in rebuilding damaged biotas. It will not be done by passive protection alone" (Leopold et al. 1963: 10). The language of the Leopold report suggests the authors saw little or no conflict between maintaining historical conditions and minimizing human effects on ecosystems. Maintaining biotic associations and restoring them, where damaged, would apparently accomplish both. Although they had no qualms about achieving the "maintenance of naturalness" through active intervention, the authors did express concern that doing so would interject artificiality. They were more concerned about the appearance of artificiality than with artificiality per se, however. Where park ecosystems are actively managed, they wrote, "observable artificiality in any form must be minimized and obscured . . . hidden from visitors insofar as possible" (Leopold et al. 1963: 6).

For those whose jobs depended on having a working definition of "protecting natural conditions," the Leopold report provided a foundation that lasted for many years: Restore the conditions that existed before people messed it up, but leave the smallest mark possible. Where conditions are perceived to have changed little since the arrival of white settlers, there is no need for intervention, and nature can be protected through a light touch. Where fire exclusion has altered fuel loads, exotic species have altered species composition, food webs, and vegetation structure, or where air pollution has altered soil or stream chemistry, the preservation of nature entails active intervention, but it should be done with as little "observable artificiality" as possible. This perspective gave rise to programs of natural fire use, feral animal control, and wildlife reintroduction that provided a comfortable foundation to national park management for decades.

The Emergence of Wilderness Values

At about the same time as the Leopold report attempted to clarify the purpose of national park management, the Wilderness Act (P.L. 88-577, 78 Stat. 890) became law. Its language stressed a meaning of naturalness that differed from the focus on historical biotic communities emphasized in the Leopold report. The founders of the wilderness movement, which began in the 1920s, saw agency promotion of recreational motoring and the resultant tendency "to barber and manicure wild America" as the single greatest threat to the protection of nature, and they advocated a new form of management with a much lighter touch. As Paul Sutter (2002: 14) notes in *Driven Wild*, his history of the early wilderness movement, "The founders of the Wilderness Society did see wilderness areas as places meant to preserve pristine nature . . . [but] . . . wilderness was as much about 'wildness,' the absence of human control, as it was about pristine ecological conditions." The primary definition of wilderness, from the Wilderness Act, is a place "where the earth and its community of life are untrammeled by man." *Untrammeled* is often misinterpreted to mean *undisturbed*; however, it is not a descriptor of the ecological condition of the land (Scott 2001). Synonymous with *unconfined*, *unfettered*, and *unrestrained*, *untrammeled* suggests freedom from human control more than lack of human effect (Cole 2000). When Howard Zahniser, author of the Wilderness Act, selected the word *untrammeled* to characterize the nature of wilderness, he intended that the law protect nature by keeping our hands off: "We must never forget, we are guardians, not gardeners" (Zahniser 1963, inside cover).

By the end of the 1960s, naturalness was being applied as a concept for guiding the stewardship of protected areas, whereas once it had been primarily a reason to establish such places. Naturalness had evolved from a simple notion of protection from development and exploitation to an elaborate set of meanings, including minimizing human effect and influence, preserving historical conditions, and minimizing control over nature. Still, it was widely perceived, at least among protected area managers, that these three meanings were essentially the same thing, that they were congruent and compatible.

Naturalness Challenged

Eventually, accumulating scientific evidence from numerous disciplines began to challenge the perception that eliminating human impacts,

maintaining historical fidelity, and not "trammeling" the land could all be achieved simultaneously on the same piece of ground.

Influence of Indigenous Populations

Research into the effects of indigenous peoples on wildland ecosystems (Day 1953) deflated the myth of the pristine wilderness (Mann 2005). Although the magnitude of past human influence was variable (Vale 2002), many park and wilderness ecosystems had been profoundly affected by humans by the time Europeans first arrived in North America (Anderson 1996). Long histories of burning and hunting, in particular, shaped the natural landscape. For example, Kay (1995) argues that native hunters kept elk populations low in Yellowstone National Park. After the creation of the park and the displacement of indigenous populations, burgeoning elk populations adversely affected willow and aspen communities, a change that has had cascading effects on beaver and other species.

Perhaps less controversial is the notion that indigenous burning has shaped many ecosystems (Pyne 1997). Indigenous people burned for many reasons, in different frequencies, intensities, locations, and seasons. Consequently, the effects of burning were widespread, often profound and variable from place to place (Kilgore 1985). Among other effects, burning maintained forest openings, decreased tree density, changed species composition, and sustained valued species. In some protected areas, in North America and certainly in other parts of the world, indigenous populations still live on the land and still shape the landscape, often in ways that are considered desirable (Gillson and Willis 2004).

The fact that many ecosystems perceived as natural were, and continue to be, substantially shaped by human activity erodes the meaning of *natural* as free from human effect. On sites that have been highly affected by human activity for millennia, the distinction between natural and artificial becomes blurred. If the purpose of protected areas is to preserve natural conditions and yet there is no objectively determined condition that can be called natural, the very purpose of protected areas is called into question. In response, some have sought to define naturalness differently, distinguishing temporally between early human influence, when technologies were less sophisticated and less of a threat to nature, and more recent human influence. For example, Landres et al. (1998: 44) suggests that, in the context of wilderness, *naturalness* should be defined as "unaffected by contemporary (roughly from the time of European settlement on) anthropogenic

influences." In Australia, legislation stipulates that it is only the effects of "modern technology" or "modern society" that are inconsistent with wilderness; aboriginal influences are consistent with wilderness (Prest 2008). In contrast, Hunter (1996) argues that *natural* should be interpreted as "without human influence," regardless of the group of people involved or the timing of their influence, even if it meant natural areas would no longer support historical conditions.

The Rise of Nonequilibrium Dynamics and the Conservation of Biodiversity

Just as evidence of indigenous influence was coming to light, ecologists were documenting the role of disturbance in shaping ecosystems, which forced a reexamination of the way nature works (White 1979; Pickett and White 1985). Rather than tending toward some primeval "natural" or climax state that existed before white settlement, ecosystems were discovered to be nonequilibrium systems, constantly changing, particularly in response to disturbance. As Sprugel (1991: 15) notes, "The notion of 'natural' vegetation or ecosystem processes . . . must be revised to recognize that there is a range of ecosystems that can legitimately be considered." There is no single "natural condition" toward which the system would tend if left alone.

The significance of this nonequilibrium paradigm shift in ecology (Pickett et al. 1992; Fiedler et al. 1997) to protected area managers cannot be overstated. This shift raised difficult questions. What is the target for an intervention designed to restore naturalness to impaired park and wilderness ecosystems if there is no single natural condition? It also occurred at a time when the failure of traditional land management practices to sustain ecosystems, or at least ecosystem elements such as Kirtland's warbler (*Dendroica kirtlandii*), was becoming acutely obvious. Recognition that so many species depended on disturbance to maintain their habitat gave rise to the idea that ecosystems that managed to sustain their characteristic disturbance regimes stood a better chance of sustaining all their parts (Pickett and White 1985).

The timing of the nonequilibrium paradigm shift also corresponded with global recognition of a biodiversity crisis (Brundtland 1987). Conservation biologists documented the greatest rate of extinctions since the end of the Pleistocene. Protected areas took on renewed importance as a bulwark of reserves necessary to combat the global extinction crisis. The

biotic associations Leopold described as the objects of protected area management were understood to encompass the entire diversity of life, further expanding the meaning of protecting naturalness. Indeed, the International Union for the Conservation of Nature (2008: 13) defines a protected area as "an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means."

Recognition of the importance of disturbance dynamics to the conservation of nature and the need for new approaches to the conservation of biodiversity led to development of the concept of historical range of variability (HRV) (Morgan et al. 1994), the idea that ecosystem characteristics are variable over time, but within bounds, and that maintaining them within those bounds necessarily maintains their components. As Pickett et al. (1992: 82) observe, "Human-generated changes must be constrained because nature has functional, historical, and evolutionary limits. Nature has a range of ways to be, but there is a limit to those ways, and therefore human changes must be within those limits." The HRV concept amplified the importance of disturbance found in the Leopold report but described it in terms of bounded behavior that would sustain the historical condition of the ecosystem. As Aplet (1999: 355) asserts, "It is the bounded condition of ecosystems, dynamic and in the presence of aboriginal man, that we may consider 'natural' or 'pristine.' "

By this definition, naturalness could be measured as the degree to which a place retains the ecological composition and structure—dynamic yet bounded over time—that characterized the system before the dramatic anthropogenic modifications of the recent past. The more native species and fewer exotic species a place retains, the more the patches retain the character of those produced by the historical disturbance regime, and the more consistent soil, air, and water quality are with historical ecosystem dynamics, the more natural the place is. Unfortunately, accumulating effects of a century or more of grazing, logging, water diversion, fire suppression, and species invasion have left many areas functioning outside HRV, and climate change threatens further alterations. Maintaining HRV increasingly entails human intervention.

The Dilemma of Wilderness Management

With recognition that maintaining ecosystem composition and function increasingly entails asserting human control, the formerly congruent mean-

ings of naturalness are conceptually split. The uneasy balance recommended by the Leopold report, which has characterized protected area management since the mid-twentieth century, cannot be sustained: In altered ecosystems, neither historical fidelity nor lack of human effect can be achieved without human control. Maintaining historical ecosystems or keeping ecosystems on the trajectory they would be on in the absence of human effects entails intentional and repeated human intervention. Cole (1996) calls this the "dilemma of wilderness management."

To illustrate this tension graphically, Aplet (1999) proposes a conceptual model (Figure 2.1) in which an axis defined by degree of manipulation or control (from controlled to "self-willed") is orthogonal to an axis describing ecological condition (from novel to pristine). For our purposes, this axis may represent either historical fidelity or lack of human effect. In the upper right corner of the figure occur the most uncontrolled, unaffected places, the large, ecologically intact landscapes where historical fidelity has been maintained without much human intervention. The Arctic National Wildlife Refuge is a prime example. Its antipode, the highly altered, highly controlled environment of the city, occurs in the lower left corner. Still other landscapes, such as the historically accurate but highly manipulated prairie restoration project at the University of Wisconsin Arboretum, belongs in the lower right-hand corner, and the C&O Canal, an

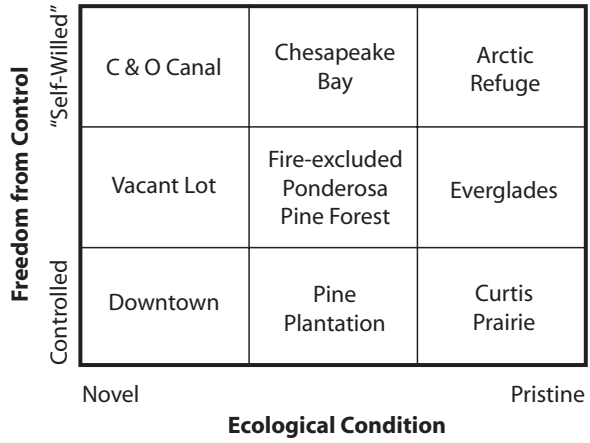

FIGURE 2.1. A conceptual model that arrays landscapes along two axes, from controlled to self-willed and from novel to pristine. The qualities these axes represent are consistent with traditional definitions of naturalness. Their use clarifies the difference in meaning between freedom from intentional human control and maintenance of historical or undisturbed conditions. (Adapted from Aplet 1999)

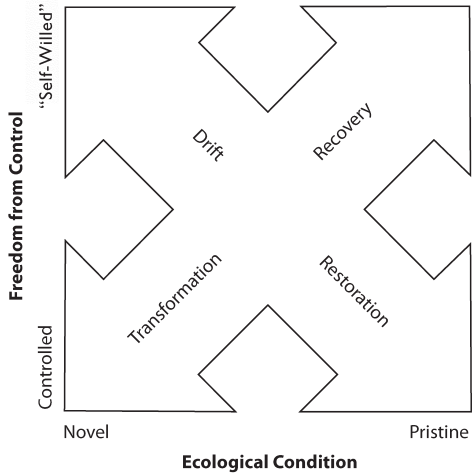

FIGURE 2.2. Like landscapes, stewardship options can be arrayed along two axes, from controlled to self-willed and from novel to pristine. (Adapted from Aplet 1999)

artificially constructed waterway parallel to the Potomac River, overgrown with exotic species, might reasonably be called ahistorical, highly altered, yet self-willed and untrammeled. Landscapes can express any combination of human control and historical fidelity. Where they are most untrammeled and unaltered, they are called wilderness.

This conceptualization can be used to contemplate the role of human agency in shaping landscape character (Figure 2.2) (Aplet 1999). Increased human effort can drive systems away from pristine conditions through transformation, as has typified the progress of civilization. This is clearly at odds with the definition of wilderness and national parks. Human effort can also be exerted to increase historical fidelity and mitigate human impacts, through the process of restoration. In the absence of active management, land freed from human control can either recover toward the pristine or drift toward a more novel condition. Franklin and Aplet (2002) assert that, for wilderness, recovery is always the ideal trajectory; however, they recognize that there will be cases in which recovery is impossible without active restoration. In these cases, the decision to intervene "will hinge on whether the potential for [recovery] outweighs the ecological uncertainties and the magnitude and duration of the required trammeling" (Franklin and Aplet 2002: 278).

The explicit separation of ecological condition from human control helped establish some precision in managing for naturalness. No longer was it appropriate to balance competing meanings of naturalness. Rather, it was important to be clear about which meaning to emphasize. This provided a frame for protected area managers to understand that their work requires choices, not balance. Protected area managers must increasingly "decide which of the two aspects of naturalness—pristine conditions or unmanipulated conditions—should be given preeminence" (Cole 1996: 16).

Ubiquitous and Directional Human Change

As appreciation of the implications of global environmental change increases, so does the need for managers to make choices, based on an understanding of differences between the three meanings of naturalness. Even the most remote places on Earth are affected by human activities (Vitousek et al. 2000). Every acre of every park and wilderness has been and will continue to be affected, to some degree, by the activities of modern technological humans. The major drivers of ecosystems are changing under the onslaught of invasive species, climate change, and other stressors. Sustaining historical ecosystem composition, structure, and function is increasingly difficult, even under heavy-handed human control. Many of these human-caused changes are not cyclical. Park conditions are not in dynamic equilibrium, varying around some functional, historical steady state. The drivers of change are directional. Future conditions will be very different from current conditions, perhaps well outside the bounds of historical variability.

Climate change, in particular, exposes the limitations of the naturalness concept. Paleoecological research (e.g., Pierce et al. 2004) reveals that fire frequency and severity have changed with shifts in climate in the past, and the increased fire activity that has characterized recent decades in the western United States (Westerling et al. 2006) can be expected to continue or worsen in the future. Species invasions have changed the rules of ecosystem dynamics over broad areas; for example, cheatgrass (*Bromus tectorum*) has permanently altered fire regimes of the Great Basin. Climate change means that park and wilderness ecosystems will inevitably be substantially affected by humans. That conclusion cannot be denied. The fact that climate change is directional and will have novel and unpredictable effects points out the limitations of HRV as a guide for the future—as a proxy of sustainable conditions. Restoration of past conditions may be a recipe for disaster if

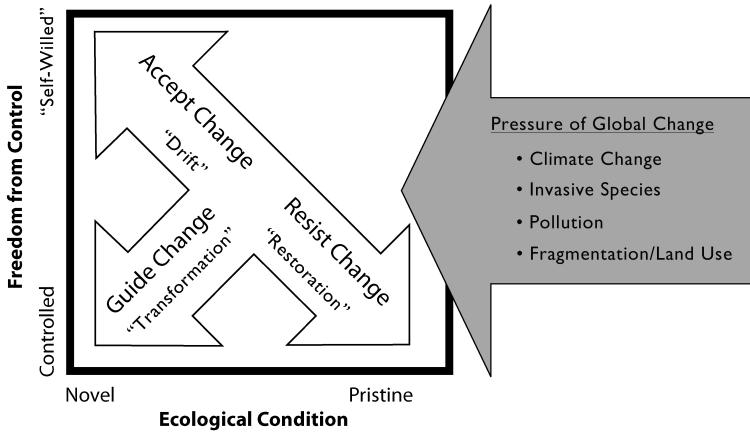

FIGURE 2.3. Global environmental change precludes the ideal stewardship option in parks and wilderness: that release from human control will increase historical fidelity and pristineness. Protected area managers must choose to increase historical fidelity through restoration, accept the change that will result from less intervention and control, or transform ecosystems to future states that are not true to the past but will protect important values and be more resilient in the face of global change.

the climatic conditions of the future are unfavorable for those ecosystems (Harris et al. 2006).

To reflect this, we have modified the model presented in Figure 2.2. Global environmental change represents an enormous pressure bearing down on the land, driving it away from historical and pristine conditions (Figure 2.3). As past controls on ecosystems change, so will those ecosystems. In the face of such pressure, recovery of historical conditions, unaided by human intervention, is not likely to be effective, even where human influence was historically minimal; consequently, the ideal approach to park and wilderness management is lost. Conservation of the species and ecosystems inherited from the past now depends on actively resisting change through restoration. Where land is untrammeled and intervention has been avoided, change is inevitable. Resultant ecosystems can no longer be expected to retain their historical character; rather, they will probably drift into new, unprecedented conditions, with unknown consequences for biodiversity. In this context, managers can either accept change or seek to guide change, using interventions to transform ecosystems into conditions more resilient to future climates, better able to conserve important ecological values. The tensions between resisting change, guiding change, and accepting change will be explored more fully in the second part of this book.

Complex and Conflicting Values

It is increasingly clear that a congruent perspective about what naturalness means, widely shared by the public, ecologists, and protected area managers, does not exist. As myths about natural systems have been deflated, the value of naturalness as a conceptual foundation on which to base operational management decisions has been called into question. If the ecosystems of parks and wilderness are unavoidably affected by humans, if the conditions of the past cannot—or even should not—be preserved, and if "untrammeling" does not lead to recovery, what does *natural* mean?

Stewardship of parks and wilderness has also been complicated by the ever-increasing array of values that have been attached to protected areas. Initially, national parks were largely about scenery and spectacle (Graber 1983), preserving favored biological and physical objects and keeping things the way they were. The advent of wilderness brought protection of places untrammeled by humans. In the late twentieth century, the conservation of biological diversity emerged as a core goal, with the definition of biological diversity expanding to include preservation of genetic diversity, species, plant and animal communities, and the fundamental physical and biological processes on which organisms depend (National Park Service 2006). Recently, there has been increased emphasis on the need for parks to provide opportunities for social engagement, for example, in restoration efforts designed to foster healthier human–nature relationships (Higgs 2003).

As park purposes and values expand, conflict between them inevitably increases. The goals of conserving all biodiversity and allowing unfettered evolution may conflict with the goals of protecting particularly valued species and preserving some places as they were in the past. Public participation in restoration can conflict with efforts to minimize human influence (Throop and Purdom 2006). Respect for nature's autonomy can conflict with the active efforts to reverse some of the deleterious effects of human activity on park and wilderness ecosystems. Managing for "naturalness" clearly does not help to resolve any of these conflicts.

Beyond Naturalness

In his provocative essay "The Trouble with Wilderness: Or Getting Back to the Wrong Nature," William Cronon (1995) argues that wilderness is not what it seems—that the unexamined and mythic meanings attached to wilderness divert attention and prevent realization of many important

environmental values. He asserts that it is time to rethink wilderness. In particular, he argues for a need to move beyond couching our conception of wilderness and the values it embodies so firmly in a dualistic vision of humans apart from nature. In a similar vein, we assert that it is time to rethink naturalness, lest the unexamined, mythical, diverse, and conflicting meanings of the term prevent realization of many important purposes and values of parks and wilderness. In particular, it is time to articulate goals and objectives for parks and wilderness that are founded in a perspective that views humans as part of, rather than apart from, nature.

Since key enabling acts and management policies were established for national parks and wilderness areas, values, beliefs, and the world itself have changed. The conservation of biological diversity has become a core value of protected areas. Beliefs about the stability of ecological systems, the insignificance of aboriginal humans as ecological agents, and our ability to mitigate the adverse effects of current and future human activity on park ecosystems have all been shaken by research in ecology, paleoecology, anthropology, and related fields. The goals that guided the conservation and restoration of large protected areas in the twentieth century—most notably the concept of naturalness—do not provide sufficient guidance for future park and wilderness stewardship.

We began this chapter by noting that naturalness is a touchstone for many people. Despite conflicting and ambiguous meanings, the concept of naturalness continues to have value, even in the context of protected area stewardship. The notion of naturalness embodies society's interest in conserving the nonhuman elements of our world. The term has mobilized public concern and interest in park and wilderness protection, and it continues to provide an idealized, general vision of what preservation is intended to achieve. The concept of naturalness is not likely to disappear from the policy frameworks that guide protected area stewardship. But times have changed. As conservation imperatives have expanded beyond the setting aside of parks and wilderness areas to working within them to protect their values, new concepts are needed to guide management—concepts that can be drawn on to articulate a desirable and attainable future for park and wilderness ecosystems that accounts for human impacts, global change, and evolving public values.

In order to develop practical operational objectives to guide stewardship, it is essential to clarify park and wilderness purposes and values, indicating more specifically what should be sustained into the future. New guiding concepts must be advanced and considered. Innovations in management strategies, planning processes, and institutions must be experimented with.

Armed with an expanded array of tools and concepts, framed in more clearly articulated policy, managers are more likely to make stewardship decisions that will secure the values of parks and wilderness in perpetuity.

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