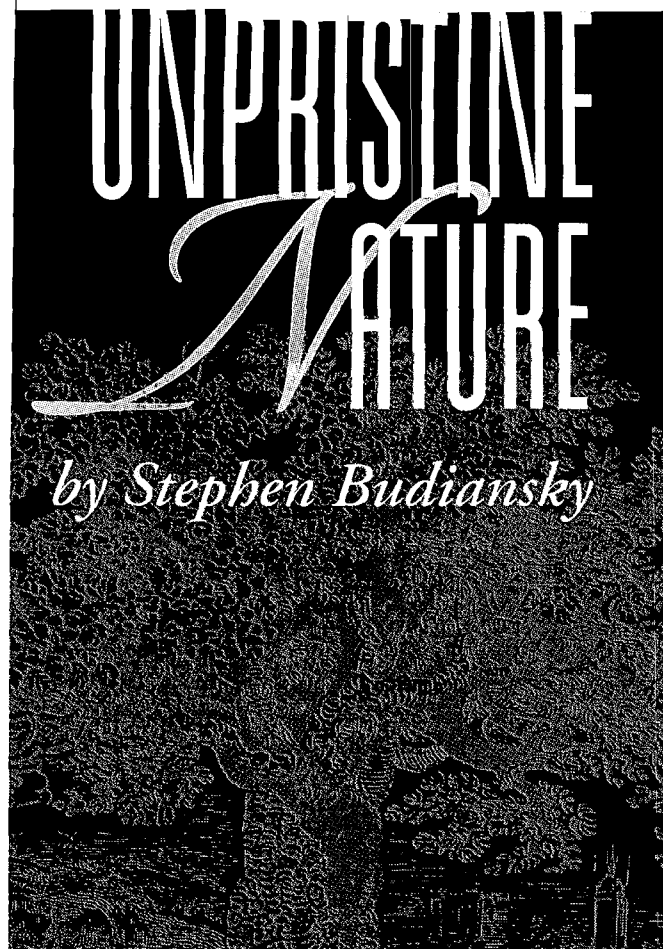


If I were setting out to write a conventional nature essay in the mode of Thoreau and his countless imitators, I should begin by describing the walk I took early this morning across field and wood. How I rejoiced in the cry of the Canada geese overhead and the flash of the white tail of a fleeting deer; how the crackling of the frosted grass beneath my feet as I crossed a hollow put me in mind of the family of wild turkeys I had seen there early in the fall; how every pore of my body was open to the sweet beneficence of Nature's society unfettered by the artifices of man.

Yet every one of those stirring sights of nature's timeless order was, in truth, nothing but the work of civilized man. The grasses in my field are aliens, timothy and bluegrass and red clover brought to America by seventeenth-century English settlers trying for a better hay crop. The sheep and horses and cattle in the field are alien imports too. But for their constant grazing, and for the annual visit of the haying machines, the open acres that stretch from my window to the copse at the bottom of the hill would in just a few years' time be choked with brambles and red cedars. But even that could hardly be counted a natural process; the return of woods to abandoned farm fields is not nature reclaiming her birthright but nature led only farther astray. Red cedars readily take over abandoned pastures today only because centuries of grazing by livestock has unnaturally suppressed the hardwoods, such as oaks, that would otherwise outcompete the red cedars; the very abundance of red cedar today is an arti-



fact of the dietary preferences of imported farm animals.

The woods down the hill are second growth on land cut over at least once, probably several times, in the last 300 years. The Canada geese, which once migrated every spring and fall, now stay year round in great flocks, growing fat and lazy on farmers' corn fields. On local golf courses and parks their abundant droppings have become a health hazard. The deer and turkey meanwhile thrive in the artificial patchwork of forest openings formed of cultivated and abandoned fields. Wildlife biologists in Virginia estimate the state's deer population at 1 million, five times the number that existed here when Europeans first arrived.

If I set forth to look beyond my artificial view across my artificial fields to the artificial wood atop the Catoctin Mountains, I would find nothing but more fakery stretching in every direction. In Scotland, rare alpine birds nest on heather moors created and maintained by burning and sheep grazing. In the tropical rain forests of Central America, thousands of years of slashing and burning by corn-growing agriculturists have cut deep marks

across lands that, in popular myth, are sacred monuments to biodiversity, the fragility of Spaceship Earth, and the seamless web of life (excepting only, of course, human life). After 10,000 years of breaking the soil, after 100,000 years of setting fire to the forests and the plains, after a million years of chasing game, human influence is woven through even what to our eyes are the most pristine landscapes.

Such observations cut against the fashion of our times. We prefer to think of nature as a setting for soul-stir-

ring contemplation of the infinite and unknowable, a cathedral to be entered with hushed tones and reverent thoughts. The nature lovers of our age jealously cling to an image of nature virginal and pure; they imagine an Arcadian wilderness where balance and harmony reign, beyond the defiling touch of man. Open any popular nature book, magazine, tract, or fundraising letter, and you do not have to read far to find the phrase, "balance of nature," the notion that nature, left alone and freed from human influence, tends toward a state of harmony, balance, and beauty—and, conversely, that wherever man treads is trouble.

"The ecological perspective begins with a view of the whole, an understanding of how the various parts of nature interact in patterns that tend toward balance and persist over time," writes Vice President Al Gore in his book *Earth in the Balance*, whose very title invokes this notion. A mailing from the Natural Resources Defense Council, an environmental lobbying and litigation organization, reprints an interview with a Cree Indian, who is quoted as saying, "The earth

was created in the way it was by the Creator, and changing it is unnatural and wrong." A series of educational videotapes for children that aims to promote "greater ecological awareness" offers such messages as "this ancient forest is capable of sustaining itself if not interfered with by humans" and "changes in nature upset the delicate balance for animals and man." In a book championing her new cause of saving the planet from environmental disaster, physician and former anti-nuclear crusader Helen Caldicott writes that "We must not disturb the hierarchical balance of nature and the food chain." These ideas have become such an accepted part of our culture that they are now the routine stuff of advertising and commerce, from \$22 "All Things are Connected" t-shirts to a multi-million-dollar Disney movie featuring ecologically conscious lions who pontificate about the "circle of life."

Increasingly, such beliefs are defended by environmentalists on grounds that do not even pretend to be scientific. Even some quite mainstream environmental advocates mumble about vibrations or psychic connections or "deep" ecology. "It seems to me that a collective biological consciousness must exist," writes Farley Mowat, a prominent Canadian environmentalist and author of *Never Cry Wolf*. "It makes no sense to deny a psychic connection," insists Mowat (who at least makes room for female human presence in nature, with his endorsement of the "ecofeminist" idea that women "are biologically and spiritually connected to the cosmos, its planetary shifts, the earth's tides and the phases of the moon"). In *Earth in the Balance*, Al Gore also endorses some odd ecofeminist contentions, discussing a "religious heritage" built on a great earth goddess and marked by "reverence for the sacredness of the earth—and a belief in the need for harmony among all living things."

Mystical belief in a "natural balance" is also found in a growing number of state-

ments to the effect that everything from the industrial accidents at Bhopal and Chernobyl to topsoil loss, deforestation, and extinctions are a result of the human race having fallen "out of balance," not only with nature but with our inner selves. "A crucial dimension of this imbalance in the West," writes author Matthew Fox, a theologian at the Institute in Culture and Creation Spirituality at Holy Name College in Oakland, California, "is

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the stunted growth of our mystical awareness and the underdevelopment of our mystical brain." This insight, he explains, came to him in a dream.

The vision of nature as a primitive wilderness shaped only by forces beyond man's ken underlies countless official policies, and is rarely questioned. Federal wilderness areas in the United States are defined, by law, to be places "where the earth and community of life are untrammelled by man, where man himself is a visitor who does not remain." The official management goal for America's national parks is the re-creation of the landscape that supposedly existed before 1492, and current park policy holds that the means to achieve this is the exclusion of all human influence.

Excluding man has become an end in itself today. What many nature lovers want, after all, is solitude; the active in-

trusions that it would take to purge the land of alien grasses and weeds with tractors and herbicides, or restore the oak savannas with bulldozers and fires and chain saws, or bring back the aspen and beavers of Yellowstone with rifles leveled at the park's elk, is not part of the program they have in mind for their "wilderness" experience. "Space enough to separate you from the buzz, bang, screech, ring, yammer, and roar of the 24-hour

commercial you wish hard your life would not be... Wilderness that is a beautiful piece of world, a place where you can be serene, that will let you contemplate and connect two consecutive thoughts, or that if need be can stir you up as you were made to be stirred up, until you blend with wind and water and earth you almost forgot where you came from." Thus spoke David Brower, the eminent conservationist who once headed the Sierra Club and the Friends of the Earth. Time and again, nature lovers launch earnest efforts to "save" from human depredation landscapes or wildlife populations that are nothing but the recent and unnatural creations of man's presence,

while they rail against the very kinds of "interference" that have for millennia shaped and perpetuated the nature they love.

When Ontario's Rondeau Provincial Park was established on the north shore of Lake Erie in 1894, no deer were observed within its 8,000 acres. The park is the largest remaining example of Carolinian forest in Canada today, and home to the largest breeding population of prothonotary warblers in the country. The park is also one of only two remaining habitats of the nodding pogonia, a rare orchid.

In 1899, five captive deer escaped from an enclosure in the park. Their numbers quickly multiplied. For many years rangers kept the deer in check by shooting them, but the culling program finally

ended in 1973 after park authorities grew weary of constantly defending themselves against protests by animal rightists.

Since then, the deer population has risen to about 500. The deer have browsed clearings hundreds of yards across, virtually stripping the forest floor bare of new seedlings of white pine, red oak, black cherry, and shagbark hickory, bringing regeneration of the forest to a halt. A new plan to cull the deer herd to about 100 animals, the maximum number that a study concluded could be sustained without damaging the park's vegetation, has met with the inevitable and vigorous objections of the Committee to Save the Rondeau Deer.

It is assuredly "unnatural" for park rangers to shoot hundreds of deer. But what, biologists who have studied the situation ask, is there left that is "natural" about Rondeau? It is unnatural for deer even to live on this patch of land. It is unnatural for 8,000 acres of wood to be totally surrounded by land intensively managed for agriculture. It is unnatural for wolf populations to have declined; for Indian hunters to have moved off and changed their way of life; for fires to have been fought; for exotic plants to have invaded. The saviors of the deer ignore a century of passive assaults and focus only on the active assault of rifle-toting men. "Land is managed with tremendous intensity and devotion around the park, and naively we believe we can just leave [Rondeau] alone," said one biologist who has studied the Rondeau deer. "The park is too small, too different, too isolated not to be managed."

The explosion of deer populations has been a worldwide phenomenon for the last half-century; so too has been the slow death of even the largest parks and forests as a result of management policies based on the ideal of noninterference. A 10-year study of the forests of Pennsylvania established a clear link between the increase in deer and the resultant loss of songbirds, woodland wildflowers, and

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overall biotic diversity. As deer increase from 10 per square mile to 64 per square mile, underbrush is stripped bare, nesting sites vanish, and the number of species of songbirds in the wood drops from 18 to 12. In Yellowstone, where elk populations have quadrupled since the park adopted a "natural regulation" policy in 1969, signs of overbrowsing are everywhere in evidence too. One of the few places in the park where the aspens and willows are doing well is a plot just south of Mammoth that is ringed with a fence to keep the elk out.

Moreover, plant and animal populations are inherently unstable. Catastro-

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phes are always occurring in nature, from a cold spring day that kills a fledgling robin to a glaciation that wipes out species. Small, isolated populations—such as are likely to be found in protected parks and reserves—are all the more susceptible to such vicissitudes of nature. A flood, a fire, a hurricane, a blight, a decade of cold winters can alter an area the size of New England for a millennium or more. When the hemlocks of New England were attacked by a fungus or insect pest 5,000 years ago, the ensuing, massive dieback persisted for 2,000 years. These are not just turns about the never-ending "natural cycles" of self-regulating nature. They are history events that affect the course of all that follows.

The story of Isle Royale, Michigan, has often been told by nature lovers eager for scientific affirmation of natural balance. The island had been overrun with moose from the turn of the century until the cold winter of 1949 froze Lake Superior and wolves from the mainland trekked across the ice. From that point on, the story goes, the populations of predator and prey have tracked one another like two swinging pendulums joined together by a spring. Wolf numbers grow, moose fall; wolves fall and moose grow; and so on *ad infinitum*. Each population traces a perfect sine wave through time.

However, since the early 1980s the moose population on Isle Royale has once again grown unchecked while wolf numbers plunged rapidly toward zero, a consequence, at least in part, of the wolves' extremely narrow genetic base: DNA studies have shown that all of the island's wolves were descended from a single female. Wildlife biologists believe that extinction of the wolves is now all but certain.

The many other isolated patches that constitute our parks and nature reserves have proved equally vulnerable to nature's vicissitudes. A lone surviving 20-acre tract of primeval hardwood forest on Mt. Pisgah, New Hampshire, was donated to Harvard University in 1927 for preservation and study; 11 years later it was leveled by a hurricane, and so went the last stand of "virgin" forest in New England. A 42-acre forest of towering white pines in Cornwall, Connecticut was similarly reduced to a heap of fallen timber by a hurricane in 1989. The 200-year-old trees, known as the Cathedral Pines, had stood 150 feet tall. After the storm, the Nature Conservancy, which had been given the forest in 1967 under the condition that the land be maintained in "a natural state," promptly issued a press release explaining that the hurricane "was just another link in the continuous chain of events that is responsible for shaping and changing this forest," and announcing that it planned to allow the forest to

continue to take its "natural course." With the single exception of agreeing to clear a 50-foot-wide firebreak around the perimeter, that is in fact what the managers have done.

Yet the Cathedral Pines' majestic stand was a pure artifact: not virgin forest at all, but second growth that sprung up on land cleared of hardwoods and then probably farmed for a time in the late eighteenth century by colonists. White pine stands were rare in New England before farmers began clearing fields: at the time the trees of the Cathedral Pines were seedlings, sprouting, most likely, in the grass of an abandoned cow pasture, Yale president Timothy Dwight wrote that all the pine woods of New England could fit into a single county.

So the "continuous chain" of events that had made the Cathedral Pines an object of admiration and the impassioned focus of more than a century of efforts to protect and preserve it were from the start artificial. Yet when a number of local officials and admirers suggested it might make sense to clear the fallen timbers and perhaps even replant the wood, environmental purists condemned the proponents for the crime of "anthropocentrism." One scientist at the Yale School of Forestry told reporters, "If you are going to clean it up, you might as well put condos on it." But why? Cleaning it up would have been no worse an ecological sin than its very existence in the first place.

Scientists at the California Department of Parks and Recreation once advocated ripping out the eucalyptus trees from the state's public parks on the grounds that they are exotic, non-native species. Opponents screamed. They liked the big trees. So, it turned out, did the butterflies and birds; 57 percent of the bird species in Angel Island State Park were found to frequent the eucalyptus groves, and 8 percent were found exclusively there. The western population of the monarch butterfly seems particularly partial to the trees, probably because they provide both shelter and food (in the form of nectar from the trees' flowers). Researchers who surveyed sites in coastal California where the butterflies winter found that 75 percent of the 112 sites contained eucalyptus trees. The other sites contained mainly native conifers,

but even these native stands were not "natural"—the trees had been planted by humans outside of their natural range.

Of course monarch butterflies did once manage to get along without trees imported from Australia, but what matters now is what will happen if those trees are removed. As scientist Walter Westman noted, it is not as if a mature forest of 50- to 100-year-old trees can be quickly replaced with native species of the same size. Even if the eucalyptus trees were removed, the return to the presumed "natural" state of vegetation at the parks is by no means assured. Of the 416 plant species identified on Angel Island, 53 are non-native. Maintaining the natural order is at the very minimum a full-time weeding job.

The invasion of exotic plants and animals is comparatively well known; America's environmental purists have learned to take no pleasure in the sweet smell of honeysuckle, they remark disapprovingly of English sparrows, and kudzu, the catastrophically lush vine imported to control erosion on hillsides that has now taken over vast stretches of the South, is a national joke. Less well known is the sweeping effect that the artificial suppression of fire has had on the landscape. In the American Midwest, suppression of fire has let pines and oaks form dense stands on what were once open savannas. Where, in the mid-nineteenth century, as few as four trees per acre stood amid prairies of tall grasses and forbs, a hundred years later stand dense forests with unbroken canopies. To literally let nature "take her course" is not one of the options any longer. The irony is that to have nature be "natural" requires constant human intrusion. Restoration projects have been remarkably successful in reconstructing and maintaining native savannas and prairies through the use of clearcutting followed by regular, deliberate burning. The artificial turns out to be more "natural" than the natural.

No matter what we choose to do, nature is being shaped by man. We can recognize the fact and try to deal with it, or we can ignore it and accept the consequences. The one thing we cannot do is remove human influence simply by closing our eyes to it.



Managing Nature in South Africa

by Duane Chapman

In 1903, the newly created Kruger National Park in South Africa held little wildlife. There were no elephant nor white rhino. Careful tracking counted one black rhino, five each of hippo and giraffe, and nine lions. Herds of zebra, buffalo, and antelope had been decimated by hunting before and during the Anglo-Boer War, but very likely disease and cyclical drought had prevented this "lowveld" from ever attaining stable, high levels of animal life.

Today, a century of careful human oversight has transformed the 5 million acres of the Kruger National Park, plus the half-million additional acres of private game reserves on the park's western edge, into a dramatic biological success. The table nearby documents the enormity of the achievements in wildlife restoration that have turned Kruger into an African equivalent of America's Yosemite Valley.

The contemporary reality of wilderness preservation is plain in Kruger: Wilderness must be managed in order to be protected. Single-minded, disciplined, scientific effort has provided the South Africans their achievements. Kruger's managers have run a large research program with 150 different projects covering everything from tsetse fly and malaria control to cheetah demographics, elephant ecology, and water and air pollution. They have used fences to separate animals from people. Wells and windmill pumps now create ponds and lakes, providing substitute water sources for absent rivers. Habitat, food, and pre-