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Stewards or Curators? Caring for Nature

The idea of "letting nature be nature" arises . . . from secondhand knowledge and nature-romanticism; it does not work in practice.

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NATURE IS ALIVE on so many scales, both spatial and temporal, that it is hard to be certain that we ever really know what is going on. Models generated from close study of one setting do not necessarily travel well. Subtle variations in climate, soils, precipitation, and a host of other variables can make for decisive differences in the interactions of flora and fauna. In all this welter, there are few general principles on which to base predictions. One of these is so reliable as to be very nearly a cliché: nature abhors a vacuum. Like most clichés, it contains an important truth: nature is constantly in flux and change itself becomes the opportunity for more change. The MDC created a vacuum when it cleared the Swift River Valley of buildings and wood lots in the 1930s. As we saw, nature began filling this vacuum with what would have been a more or less typical New England forest cover—species of oak, maple, cherry, ash, and, of course, birch, hemlock, and white pine, to name the dominant varieties. These also happen to be the ingredients for gourmet dining for white-tailed deer. Absent predation, including human predation, the deer began creating their own vacuum. Their food preferences began to dictate what would and would not grow.

For reasons we need not rehearse, in the late 1980s the MDC set a course to reduce significantly the size of the deer herd by means of a controlled hunt, in effect creating another sort of vacuum into which, it hoped, a wider range of tree species and age classes would grow. When the controversy over forestry practices and the hunt first flared, the intensity of the conflict obscured an important feature of the MDC management plan. The MDC wanted a forest with virtually all the qualities that its critics valued—a forest more nearly like what would have been there had no reservoir been created. The problem was not simply that the deer would not let such a forest develop on its own, but also that the deer stymied the MDC's efforts to help such a forest develop. Well established silvaculture techniques, instead of encouraging regeneration and species diversity, simply generated more deer browse. To make matters worse, chronic overbrowsing had produced a forest that, even if left to itself in the absence of deer, would not yield much regeneration or diversity until some major disturbance chanced along. The combination of a thick canopy of mature trees and an equally thick mat of ferns on the ground did not make for favorable tree growing conditions.

The result was deeply paradoxical. Everyone wanted to see the Quabbin forest become richly diverse, resembling as closely as possible a "typical New England eco-system." Given the deer, however, the only way to get to that "so-called natural" condition was to manage the deer herd and the forest, keeping the reproduction of the former down while boosting the regeneration of the latter. Advocates of "nature's way" refused to accept the paradox. Managing nature was anathema, period. With the hunt a fait accompli, the MDC would have their practices put to the test.

The success of the first hunt in 1991 was repeated in 1992. Though fewer deer were killed in Pelham the second year, the kill on the newly opened Prescott Peninsula was even higher than it had been the first year in Pelham. In all, 724 deer were killed in 1992, compared to the first year kill of 576. Again, there were no accidents, no dead eagles, and this time there was only a small symbolic protest by a handful of animal rights advocates. With the hunt on track, the MDC began to plan its strategy for the forest's recovery. In 1994, the first of what would be-

come an annual public Quabbin Land Management Workshop was held to inform all interested parties about what was being observed on the reservation and to present a draft of what was ultimately to become the "1995-2004 Quabbin Land Management Plan." The draft plan called for a pattern of selective cuts involving roughly five hundred to fifteen hundred acres each year. Each of the cuts would be quite small, few exceeding five contiguous acres, and they would be spread out over the fifty-five thousand acres of the reservation. Some of the cuts were designed to initiate regeneration essentially by clear cutting (in the parlance of forestry, these are called "regeneration cuts"). Where desired seed stock was absent, as in many of the red-pine plantations, seedlings of the desired species would be planted in these cleared areas. Otherwise, the clearings would be left to fill in by themselves. Once regeneration was underway, the MDC would conduct "release cuts": the selective removal of mature trees around regeneration plots so as to allow more sun to spur the young trees' growth. These areas would be closely monitored to assess the extent of deer browse. In addition, the MDC installed electric fenced exclosures, mostly in the Quabbin Park, the only area of the reservation not slated to be hunted.*

With the regeneration and release cuts underway, additional sections of the reservation were opened to hunters. In 1993 Hardwick and New Salem were hunted for the first time. Considerably fewer deer were shot in these two areas, compared to the first-year kills in Pelham and on the Prescott. Still, with four of the six areas of the reservation now being hunted, 474 deer were killed in 1993. In 1994 Petersham, the last of the areas to be hunted, was opened and the number of deer killed rose sharply to 673 (456 in Petersham alone). In 1995 the number of deer killed dropped sharply to 284, raising hopes that control over the deer herd was at hand. The 1996 season was a poor one for hunting. The weather was miserable, and with each area hunted for only three days, many hunters had their entire three-day hunt washed out. Only 129 deer were taken. In 1997, with more favorable weather, the number of

*The so-called "park" is the only area of the reservation to which the public has open access during daylight hours. The roads are hard surfaced and there are pull-offs as well as an observation tower that afford panoramic views of the reservoir and surrounding forest as well as picnic areas. It is in this section of the reservation that visitors used to feed the deer.

deer. Ken doubled the previous year's kill but was still far below the peak of 1992, when only two areas were hunted. The declining harvest appeared to signal a significantly reduced deer herd.

It took only a few years for the results of this two-pronged strategy of stimulating regeneration and keeping the pressure on deer to be noticeable. Young saplings began to appear and, most crucially, many were escaping the attention of deer. To be sure, regeneration was still more robust within the fenced areas than on the outside, suggesting that the deer were continuing to have an impact on the forest. By the 1996 Quabbin Land Management Workshop, with the last of the five years of hunting fast approaching, more definitive results began to come in. A botanist from the University of Massachusetts who had been studying the Quabbin for years reported that she and her graduate students had found a few wildflowers, the first that had been seen on the reservation in memory. To this encouraging news was added more precise information regarding tree regeneration. It is worth quoting at some length the 1996 report of the MDC Land Management Program.

The results of regeneration monitoring continue to be encouraging, although they are quite variable by area. For the watershed reservation (previously not hunted) as a whole, mean per acre regeneration values for "disturbed" areas (that is, where light is not limiting and regeneration is expected to occur) have progressed steadily. In 1989, these means showed a total average number of regeneration stems (one foot tall to one inch in diameter at breast height) of 1533. This same summary averaged 3237 in 1994 and 3629 in 1995. Likewise, there has been steady progress in both the unfenced and the fenced permanent 1/100th acre regeneration plots in Pelham. The mean value for regeneration 1' to 4.5' tall for unfenced plots has moved steadily from 38 stems per acre in 1991 to 208 stems in 1995; for regeneration greater than 4.5' tall the numbers have moved from 3 to more than 20 per acre. For fenced plots, regeneration from 1' to 4.5' has moved from 47 stems in 1991 to 708 in 1995; for regeneration greater than 4.5', the numbers have moved from 0 stems, on average, to 114 per acre in 1995.

Progress was real and measurable, but these figures also made plain that it would be some time before the effects of decades of deer browse would no longer be apparent. The report blandly noted that "plans for

FY-97 call for a continuation of controlled hunts in all five areas. . . ." The initial proposal over which the controversy raged in the early '90s was for a five-year hunt. Some of the original opponents of the hunt had feared that the five-year hunt would simply be an opening wedge and that hunting would, in fact, become an institutionalized feature of the management of the Quabbin. They were right, though for wrong reasons. Opponents of the hunt assumed that once in, hunters would form a strong lobby and, with the support of the Division of Fisheries and Wildlife, simply muscle the door to hunting wide open. In fact, as we shall see in greater detail below, hunter interest in the Quabbin hunt would drop quite precipitously after the 1996 hunt, and the Division of Fisheries and Wildlife has become more a pliant supporter of the MDC than the juggernaut the antihunting forces feared. Regeneration, not a hunting lobby, drove the decision to seek an open-ended continuation of the hunt.

The problem the MDC faced in 1997 was the result of the success of their efforts to spur tree regeneration. Regeneration had begun, but as the numbers cited above make clear, the bulk of this new growth was under 4.5 feet, the height generally regarded as safe from significant deer browse. In other words, to stop hunting deer, having just produced a crop of high quality deer habitat, would mean only one thing—a surge in deer numbers. The fecundity of deer rivals the legendary capacities of rabbits. One of the longest running and most carefully controlled studies of deer showed that in good habitat, such as the Quabbin, deer can attain a herd growth rate of 50 percent per year if hunting is taken out of the equation.¹ In other words, ceasing the hunt after the fifth year would, in all likelihood, put things right back to where they had been in 1990.

Another problem was equally clear by 1996: despite the evident successes of the hunt, regeneration in most areas of the reservation was still markedly lower than it was in similar areas outside the reservation. Perhaps deer reproduction was keeping pace with the hunters, with the net result less reduction in the size of the herd than the kill was leading everyone to believe. By the 1998 workshop, held in early June, the question of the deer herd size became all the more pressing. In all but one of the five areas of the Quabbin, results of deer browse surveys,

while showing a downward trend, were still hovering at or very near the mark foresters considered to be "severe": when 30 percent of all available stems in test plots show evidence of having been newly browsed. For example, in Pelham, the area hunted longest, the browsing survey showed a 28 percent level of deer browse. Two of the areas, Prescott and Petersham, were still at 30 percent. Only in Hardwick, where the numbers of deer killed had not even been as large as in most other areas, were the declines in browse dramatic, down from a whopping 49 percent in 1996 to a minuscule 3 percent in the spring of 1998. The 1998 browse survey turned up a new source of concern: "significant evidence of browsing at heights above 5 feet and up to eight [feet] or more." Moose.

When *Going Wild* went to press in 1993, there were occasional sightings of moose in the area. In 1990, when I interviewed Paul Lyons, the MDC's wildlife biologist, he was certain that moose had become regular visitors to the Quabbin but doubted that a permanent breeding population had taken up residence. Since then, things appear to have changed rather rapidly. The moose population has grown steadily, and by 1997 it had become large enough to spur the state highway department to erect signs warning motorists of moose crossings on the major east-west highway that runs just north of the Quabbin. It is still not absolutely clear that moose actually have set up housekeeping at the Quabbin, but if they have not, it is just a matter of time—and the time will be measured in a year or two, not decades. There can be little doubt that soon the MDC is going to have to confront the damage done by moose. But this gets us a bit ahead of the story. Let us return, briefly, to 1996-97.

As noted, the 1996 workshop report indicated plans for continuing the hunt. The biologists and foresters managing the Quabbin clearly regarded this extension an open and shut case. The data the MDC had gathered over the previous five years clearly vindicated the MDC position on the relationship between deer and forest regeneration. And despite the evident successes of the annual hunts, the continuing evidence that deer were continuing to depress regeneration was compelling reason to continue keeping pressure on the deer herd. There was

also no doubt about the agency's ability to manage a controlled deer hunt effectively after five years of virtually uneventful hunting. In fact, the only blemish on the hunt came in the third year when a hunter mistook a female moose for a deer and killed it.* Moreover, public protests over the hunt had, by the third hunt, virtually disappeared, and the most vocal of the agency's critics, the Quabbin Protective Alliance, had dissolved, a fate common to single-issue grassroots protest groups. It is no wonder that the Quabbin managers took the reauthorization of the hunt for granted.

Behind the scenes, however, the two well-established organizations that had opposed the hunt from the outset, the MSPCA and Massachusetts Audubon (not to be confused with National Audubon), went directly to the MDC Board of Commissioners, a group of political appointees far removed from the Quabbin who are in charge of overseeing the operations of the sprawling state agency which not only looks after watersheds but also has skating rinks, parks, and other public assets spread far and wide across the eastern half of the Commonwealth. Much to the surprise and chagrin of the people in charge of the Quabbin, the board voted to suspend the hunt before even listening to presentations from their own staff. A hue and cry arose, and within days a chastened board solicited the views of the people directly in charge of managing the Quabbin. After hearing the careful analysis of the Quabbin managers, the board reversed itself and authorized the continuation of the hunt. As if it hadn't been made abundantly clear earlier, it was certainly now clear that the managers of the Quabbin would be harried both by unguulates and by organizations committed to letting nature take its own course.

The point was driven home in the spring of 1998: the Quabbin Watershed Advisory Committee (QWAC) recommended that hunting in New Salem be stopped "as an experiment," despite the unanimous recommendation of the Quabbin managers that the hunt go

*This, of course, was a clear violation of the state's game laws. The hunter reported his mistake immediately and was subsequently fined and had his hunting privileges withdrawn for several years. Because he was forthcoming, this punishment was considerably lighter than the law allowed.

forward on all five areas and despite the evidence of continuing significant deer browse in New Salem.* QWAC had evolved out of a group made up exclusively of people interested in issues related to access to sport fishing on the reservoir. With broader environmental issues rising to the fore, the legislature revised both the membership and the charge of the committee and gave it a new name. QWAC's membership continued to include delegates from the Commonwealth's fishing and hunting communities but now also included members drawn from the broader spectrum of environmentalists, including representatives from Massachusetts Audubon, the MSPCA, the Sierra Club, as well as people from the communities sharing common boundaries with MDC watershed lands.

Massachusetts Audubon and the MSPCA, having lost their campaign to cancel the entire hunt the year before, decided to settle for a fifth of a loaf. The two organizations argued that it was time to see if the hunt was really a continuing necessity. New Salem seemed a good place to start. The deer kill in New Salem had been consistently low (only nine deer were shot in the New Salem area during the 1997 season), in part because the topography and forest cover there make it much harder to hunt than the other sections of the reservation. Despite the relatively low deer kill, regeneration in New Salem has been rather impressive, suggesting that the herd there may have been smaller to start with. The 1997 survey of test plots shows three times as many stems per acre in New Salem as on the Prescott Peninsula. Indeed, New Salem compared favorably to the number of stems per acre in test plots off the reservation. The combination of a low deer kill and relatively high regeneration lent a superficial legitimacy to the proposal to suspend hunting in New Salem. To everyone's surprise, the QWAC members representing hunters sided with their old enemies, once more confirming the old saw that politics makes for strange bedfellows. The hunting members of QWAC no doubt reasoned that suspending the hunt would result in a larger herd, which would compel the MDC to reopen the area to hunters, who would be greeted, in turn, with good

*Though technically only advisory, the managers of the Quabbin have made a point of taking QWAC very seriously, not least because they have a strong preference for avoiding confrontation and the bad publicity that inevitably would follow.

hunting—that is, more “targets.” The MDC personnel with whom I spoke were not surprised by the position taken by MSPCA and Mass Audubon, though their continued refusal to acknowledge either the initial problem or the incontrovertible evidence of the success of the MDC's strategy was a source of disappointment verging on bitterness. But, having received enormous abuse over hunting, the MDC was genuinely dismayed by hunters so quickly abandoning their initial professed willingness to be “tools of management.” By breaking ranks with the MDC and its goal of managing a resource in an environmentally sensitive way, this group of hunters confirmed what antihunters and many in the MDC had thought all along: that hunters are interested in the environment only to the extent that this means more opportunities to hunt. The net result was that there was virtually no public support for the MDC's position that all five sections of the reservation continue to be open to regulated hunting.* QWAC bought the idea of the closure as an “experiment.”

The managers with whom I spoke were dismissive of this “experiment.” From their point of view, there was no need for experimenting with New Salem—in effect, that experiment had already been conducted in the decades before the hunting began. And though regeneration was robust in New Salem, the levels of browse showing up in field surveys suggested that there were still plenty of deer in the area. Moreover, fewer than half the deer killed in New Salem during the 1996 and 1997 seasons were female, as opposed to the average of 60 percent females shot on the reservation over the seven years of the hunt. From the beginning, the hunt had been designed to reduce the number of females, the key to reducing and then stabilizing the size of the herd as a whole. But the sex ratio of the New Salem herd continued to favor

*The situation, already overbrimming with irony, thus produced another. The Division of Fisheries and Wildlife, the *bête noir* of the opponents of the hunt who were certain that with hunting and fishing now allowed the division basically would bully the MDC into turning the reservation into a sportsman's paradise, was in complete accord with the MDC's desire to continue hunting in all five areas of the reservation. Increasingly, the division is compelled to respond to nuisance animal reports, many involving white-tailed deer. Whatever their historic bias toward providing “targets” for the sportsmen and women whose license fees fund their work, their mission and self-definition is changing from a “give-ern-targets” mentality to a much more sophisticated ideal of stewardship that has gone largely unheralded—for reasons we shall explore later.

population growth. To make matters worse, the winter of 1997-98 was unusually mild and there was a large mast crop. This almost certainly meant that the does entered the winter in good condition and gave birth to healthy fawns in the spring of 1998. With hunting suspended for the fall, and with plenty of browse available from the regeneration that has been occurring, the herd in New Salem is poised for robust growth. Thus, the outcome of this "experiment" is likely to be far more satisfying to hunters than to the foes of hunting who pressed for closing New Salem. The ideological commitment of Massachusetts Audubon and the MSPCA to an unmanaged nature will in all likelihood be trumped by deer biology, and this will mean the eventual resumption of hunting in New Salem.

The hunters who sided with the opponents of hunting should take little comfort from the prospect of one-upping their foes. Though they may "win" in the short run, in the longer run their shortsightedness may be every bit as self-defeating as the ideological rigidity of the MSPCA and Massachusetts Audubon. If large numbers of hunters begin to insist that the deer herd on the reservation be managed to maximize opportunities to shoot deer, they will do themselves a serious disservice and may well wear out their welcome thoroughly. The public's patience with hunters whose exclusive interest is in having animals to shoot at is wearing thin. The Quabbin hunt presents hunters with an opportunity to demonstrate that they not only can be safe and considerate but also informed and engaged environmentalists willing to enlist in the management of a precious natural resource even though this may mean fewer opportunities to kill a deer.

Some hunters seem to have gotten this message, judging from the numbers of hunters who have applied for the hunt year after year, even though the annual numbers of deer killed were falling off sharply. To be sure, the number of hunters applying for permits to hunt the Quabbin declined steadily after the first couple of years. In the first year, over seven thousand hunters applied for a little over one thousand permits. Applications rose in 1992, no doubt reflecting keen interest in the Prescott Peninsula, long regarded as one of the "wildest" and most scenic of the areas of the Quabbin and one to which public access had long been most restricted. Just over two thousand of these applicants were chosen. Ever since, the number of applicants has been declining.

In 1997, 1790 hunters applied and 1325 were selected. It is unclear what, if any, effect the withdrawal of New Salem from the 1998 hunt will have on applications, but it is unlikely to boost the number.

The MDC is a bit worried about this trend, but there are some virtues concealed in the shrinking applicant pool. It is likely that as the challenge of the hunt has risen, with the deer no longer either super-abundant or virtually tame, the motives of the hunters who apply are different. The novelty of hunting in a seemingly pristine area has worn off, and the likelihood of coming home with a deer is now more nearly the same as hunting anywhere else in Massachusetts. Thus it is probable that many of the people who now are applying to hunt the Quabbin appreciate the virtues of a controlled hunt—assignment to a particular area which reduces competition as well as the risk of accident, and not having to worry about gaining several different landowners' permission—as well as the satisfaction of knowing that they are assisting in a worthy endeavor.

Still, if the number of applicants continues to decline, it may be necessary to adopt a system that permits both individuals and groups to participate in the hunt. It might also become necessary to cultivate actively a core group of hunters who can be depended upon, year in and year out, to concentrate their hunting efforts on the Quabbin, becoming, in effect, more nearly full-fledged members of a management team.

In short, though the hunt is having its intended effects and the annual hunts have gone smoothly, if not always flawlessly, there are plenty of sources of concern. Opposition to the hunt and, more broadly, to the management of nature, remains institutionalized and persistent, despite repeated confirmations of the soundness of the Quabbin managers' efforts.* The problem, of course, is that the success of the Quabbin managers does not lead to the stability and self-management for

*While Mass Audubon and the MSPCA were trying to subvert the Quabbin management plan, the Forest Stewardship Council, which calls itself an "international, non-governmental organization which promotes the certification of forest management which is environmentally sound, socially beneficial, and economically viable," was drafting strict standards by which forestry operations could be certified, with the wood products labeled so that consumers can be assured that they are purchasing lumber taken from well-managed forests. Another independent group, SmartWood, evaluated the Quabbin forestry operation using the FSC draft standards and gave the Quabbin its highest rating, sort of the equivalent of the Good Housekeeping seal of approval.

which the critics yearn. A healthy and diverse forest will always be fine deer habitat. With moose added to the mix, the challenges the MDC faces increase. It is hard even to contemplate the hue and cry that would go up should the managers some day conclude that moose, too, will have to be hunted. The mere mention of a moose hunt caused eyes to roll among the Quabbin personnel.

There are other troublesome matters that make the management of the Quabbin complicated. Beaver and muskrat populations appear to be on the rise, as they are throughout much of the rest of the state. When I talked about beaver with MDC staffers in 1990-91, the beaver were at a low ebb, the deer having effectively deprived them of habitat. With fewer deer and more regeneration, they knew the beaver would eventually stage a comeback. But this was not a huge concern then because the MDC did not have to seek authority to trap beaver and so controlling the beaver population could be done well below the radar screen of the public. That was 1991. In 1996, the MSPCA, the Humane Society of the United States (HSUS), Massachusetts Audubon, CEASE, and a variety of other animal rights groups carried out a very effective ballot initiative campaign aimed at eliminating trapping with leghold or body gripping traps. The measure passed by a margin of two to one. Now that the only traps legal for use in Massachusetts are the Bailey and Hancock traps, controlling beaver and muskrat is a far less simple matter. Both are large, cumbersome affairs; worse than the inconvenience in using them is their lowered effectiveness. When the beaver become numerous enough to be a serious problem, the MDC will almost certainly seek exemption from the ban on leghold traps in a process that requires public hearings. This will embroil the agency in yet another highly charged debate.*

The ban on traps, like the initial controversy over the deer hunt and the forestry practices of the MDC, reflects a dramatic shift in how the

*It may well be the case that work on this ballot initiative drew the energies and attention of animal rights activists away from the Quabbin deer hunt. In any event, the activists will be aroused when, as seem likely, the MDC will need to control beaver more aggressively. The irony is that regardless of the method of trapping, whether with live traps or body gripping traps, beaver will be killed. State law forbids the transport and release of wild animals, so the "humanely" trapped animals will be destroyed.

public views nature and natural resources. A generation ago, those who thought about the natural environment generally worried that we were not paying sufficient attention to the warnings of environmental scientists and resource managers. Bent on raising standards of living, we were not conserving precious resources. Attention mostly centered on non-renewable resources like oil, but there was also alarm sounded about exceeding the capacities of our forests, oceans, and rangelands to keep up with our intensifying harvests. Though our wasteful ways have continued, largely unabated, more and more Americans have begun to question these practices. When I began writing *Going Wild*, this shift was already well under way. It has gathered even more momentum since, with the result that episodes like the controversy over the Quabbin deer hunt are fast becoming commonplace. Though I did not fully appreciate it at the time, the Quabbin controversy is a chapter in a much larger story. It is to this larger picture that I would like now to turn.

Loss and Hope

For much of the past 150 years, roughly the period in which the genre of nature writing developed and during which modern environmentalism took shape, Americans who cared to listen have heard a mounting litany of woe. George Perkins Marsh set the tone when he observed that our ignorance and indifference were upsetting the delicate balance that gives the physical world its integrity. In our wake, Marsh saw a turbulent mix of disruption and ruin. On his world travels as well as from his farm in central Vermont, he watched thickly forested hillsides denuded, replaced by farms and grazing animals. The trees which once shielded the land were turned into lumber and fuel, the latter filling the air with acrid smoke. The spread of agriculture prevented reforestation, depriving wildlife of vital habitat at the same time that wildlife populations were being heavily exploited for meat, fur, hides, and feathers. The physical world around him was threatening to become, like Humpty Dumpty, shattered into a jumble of fragments utterly lacking in coherence. Ever since, nature writing has been framed by this narrative of loss. Even when the writing was rhapsodic, as was Muir's, the spectacles and wonders evoked could not help impressing upon the

reader the widening circle of disruption and degradation against which Muir's beloved Sierras seemed even more compelling. This sense of loss lent urgency, in Muir's day as in our own, to the desire to protect those few places yet to bear the full brunt of civilization.

To be sure, there was a counterpoint to writing about nature in elegiac mode. John Burroughs, a contemporary of John Muir and the most widely read nature writer in the decades around the turn of the century, wrote compellingly about the marvels revealed by a close observation of nature, including even the highly modified nature of one's own backyard or nearby vacant lot. Though Burroughs traveled widely, he did not insist, as Muir did, upon making invidious comparisons between nature in farm country and the pristine high Sierras. Burroughs insisted that nature is everywhere and on all scales irrepressibly bringing forth life. Our back yards cannot compare with the spectacle of Yosemite Falls, but the delicacy of a moth's wing is every bit as spellbinding at home as it is in some sublime setting. Burroughs was not an apologist for exploiters of nature any more than he was indifferent to the damage industrialism and urbanism were inflicting upon the landscape. Indeed, his voice was one of the more persuasive in the mounting chorus demanding that our natural resources be protected from heedless over-exploitation. He was an ardent supporter of the Adirondack Park, not least because it embraced a mix of preserve and prudent use. He aligned himself with Theodore Roosevelt's and Gifford Pinchot's efforts to institutionalize the ethos of stewardship in our nation's utilization of natural resources.

Echoes of Burroughs's inclination to temper loss and degradation with accounts of nature's resilience continue down to the present, even though they are often framed within the narrative of loss. Scott Russell Sanders and Robert Sullivan each have engagingly insinuated an ironic note into the dominant narrative of loss.² Sanders recalls growing up on an army base in Ohio where, along with spent ordnance, decommissioned jeeps, and sundry leavings of army life, all sorts of wildlife abounded, seemingly indifferent to the target practice and war games going on around them. Sullivan's chosen landscape is an even more unlikely place in which to appreciate nature: the Meadowlands, just across the Hudson from New York City, is one of the most alternately

abused and neglected patches of territory in the New World, right up there with Butte, Montana, and Sudbury, Ontario. Even a talent as large as Burroughs would have had trouble finding anything inspiring, much less redemptive, in the Meadowlands. And yet, with considerable irony, Sullivan finds nature at work, in places appearing to have begun to neutralize if not erase the most obvious evidence of our abuse. Like salmon defying currents to get upstream, microbes team up with flora and fauna to reclaim what they can for their own. There are impediments to this reclamation, of course. However generative and resilient nature might be, we have put some impressive barriers in its way, just as we have erected dams for which the salmon is no match. The Meadowlands will never be what it was before we began dumping, filling, and otherwise defiling the area. But if we can keep from insulting it further, if we could even give nature a bit of a helping hand, the Meadowlands might not forever remain a monument to our greed and shortsightedness.

Army bases, dumps, and fields laced with chemicals are irrevocably altered, these writers tell us, but there is nevertheless a constant generative force at the heart of nature that is as undaunted by our sea walls and dikes as it is by our heedless profligacy. And many creatures, especially small ones, actually can thrive on our modifications of the environment. The late Vincent Dethier, a zoologist, demonstrates this charmingly in his book, *The Ecology of a Summer House*. Dethier catalogues the creatures, from wasps to mice and bats, who share his cottage on an island off the coast of Maine and seem not the least inconvenienced by human intrusion. Of course, there have been real and permanent losses, but that is not the whole story. Indeed, even so confirmed an elegist as Bill McKibben admits some small ray of hope in his recent collection of essays, *Hope, Human and Wild*.

These two narratives, one of loss, the other of recovery, have dominated our thinking about nature and have shaped our contradictory and often embattled attempts to define an ethically and materially sustainable relationship with the natural world. In their extreme versions, these two narratives are diametrically opposed. The narrative of loss becomes a wholesale condemnation of modern society and an evocation of a fast-approaching apocalypse. At the other extreme, the narrative of recovery

can provide a fig leaf of respectability for the so-called Wise Use movement and others who reject virtually all environmental regulation and restraint on exploitation. The narrative of recovery also underpins those few scholars who remain convinced that nature's bounty is, for all practical purposes, unlimited, even capable of absorbing very large increases in human population.³ Between these poles, however, there is considerable flux between optimism and pessimism and lines are easily blurred. And yet, for all the mood swings, one of the truly remarkable features of an otherwise polarized and volatile public has been the consistency of the American public's concern over the environment. The narrative of loss has gotten peoples' attention and made them worried.

For the past twenty-five years, public opinion polls have recorded strong support for spending tax dollars on the environment. For example, the National Opinion Research Center (NORC) at the University of Chicago has been asking carefully drawn random samples of Americans about their support for environmental spending nearly every year since 1973. In only two of twenty-five years between then and now has support for increased spending on the environment dipped close to 50 percent. In most of the past twenty-five years, two-thirds to three-quarters of Americans said that the United States was spending too little "on improving and protecting the environment." This willingness to commit more tax dollars to the environment is all the more impressive given the prevailing anti-tax, anti-government-spending mood of the country. In fact, public support for environmental spending rose sharply through the Reagan-Bush and Bush-Quayle era (see chart 1 in the appendix).

It also should be noted that support for spending on the environment is evenly spread throughout the population: there is no gender gap and differences along racial lines are small compared to black-white differences on most other policy issues. Only when we look at age do we find appreciable variations in levels of support for increased spending on the environment. As one might expect, young Americans are far more likely to think we are spending too little on the environment than are older Americans. Seventy-four percent of those under thirty say we are spending too little while only 47 percent of those fifty and older think too little is being spent.

In 1993, 1994, and 1996, NORC asked a range of more detailed questions about Americans' attitudes toward the environment that go beyond a general endorsement of higher spending. Over half of the respondents in 1993 and 1994 claimed that "I do what is right for the environment, even when it costs more money or takes up more time." Once again, the only variation of note in this response comes with age, but here things are reversed: surprisingly, the younger respondents are less likely (46 percent) to say they "do the right thing" than their older counterparts, 63 percent of whom say they try to do what's right.

To be sure, all is not sweetness and light. When the questions get more pointed, environmentalism starts heading south. Barely 50 percent of those polled in 1993-94 said that they would be willing to pay "much higher prices," a little more than a third said they would be willing to pay "much higher taxes," and less than one-third said that they would accept cuts in their standard of living "in order to protect the environment" (see chart 2 in the appendix).

It is tempting to interpret this cynically and conclude that since Americans are not prepared to put their money where their mouths are, there is little reason to pay attention to their pious utterances. This would be a mistake. However important money may be, it is not the only measure of commitment to protecting the environment. For example, when they were asked in 1996 whether or not they agreed with this statement—"Natural environments that support scarce or endangered species should be left alone, no matter how great the economic benefits to your community from developing them commercially might be"—60 percent of the respondents agreed. Unfortunately, we do not have a time series on this question, but it is hard to imagine a representative cross section of Americans giving assent to this question in, say, 1950. Indeed, it is doubtful that anyone would have dreamt of asking such a question in 1950. Even more impressive, especially with all the gnashing of teeth over government intruding on the rights, especially the property rights, of Americans that has characterized public discourse for the past twenty years, Americans are surprisingly willing to accept regulations aimed at protecting the environment. For example, 89 percent endorsed the following statement: "It should be the government's responsibility to impose strict laws to make industry do less damage to the environment." More astonishingly, 73 percent agreed

that "for certain problems, like environmental pollution, international bodies should have the right to enforce solutions." It would appear that only a handful of Americans are worried about the United Nations flying black helicopters over Idaho and Montana.

If this were all there was to the story, the matters before us would be simple: Americans, by a large margin, endorse solicitude for the environment, even though their resolve wavers when that solicitude has some bite—when it takes something out of their pocket or puts a crimp into their life style. The plot thickens, however, when we consider what people have in mind when they embrace nature. The shift in the way Americans view nature goes well beyond wanting more trees and fewer strip malls. Appetite for the *wild* has been awakened, almost as if large numbers of our fellows had read and taken to heart Thoreau's memorable assertion, "In wildness is the preservation of the World."

Thoreau was not speaking for his contemporaries when he praised wildness. They were still busy pushing wildness as far away as possible, preferring instead clear boundaries, well-kept fields, and domestic animals safe from wildlife that threatened or competed with them. By the beginning of the twentieth century, perhaps because the prospect of wildness holding back the march of civilization no longer seemed nearly as threatening, steadily growing numbers of Americans sought out remote areas which, even though not wild in the fullest sense, stood in sharp contrast to the cities and suburbs from which the sojourners hailed. Hiking and camping, as well as fishing and hunting for recreation, as opposed to subsistence, became very popular, and once paid vacations became widespread, visits to state and national parks and forests rose sharply.

Thoreau's wild was an abstraction, a metaphor really.* Ever since Thoreau, people drawn to the wild have imagined that by immersing themselves in nature, they come face to face with eternal truths, not least of which is an understanding of how the natural world is intricately stitched together in elaborate webs of symbiotic relationships.

*In fact, Thoreau's experience in the deep woods of Maine did not exactly inspire him. He was uncomfortable with the remoteness and even more with the impenetrable tangles of trees, vines, and blowdowns that impeded his movement as well as his capacity to see much beyond the end of his nose.

The wild has come to represent all that is pure and innocent, in sharp distinction to the earlier view that the wild was Satan's sanctuary. In the early stages of this shift in perspective, the desire to preserve at least portions of what remained of the wild got folded in, albeit with some creases, with the emerging ethos of stewardship. The idea was to conduct ourselves in ways that would sustain natural diversity and yield a continuing harvest of resources, both material and aesthetic—to preserve here, prudently use there, and, where possible, promote the idea of multiple use so as to broaden the ranks of those who have a commitment to the wild.

In recent decades, the reverence for the wild has increased and stewardship has become suspect, at least in part because stewardship has frequently seemed to be joined at the hip with the forces intent on boosting consumption and intensifying the harvest. In effect, the narrative of loss has turned the dominant national celebration of Manifest Destiny and growth on its head—the march of progress is now commonly depicted as heading us for a cliff and the state and federal agencies managing our natural resources are characterized as villains, if not leading the march at least playing an active supportive role.

Again, data from NORC's General Social Survey, 1993 and 1994 are instructive. A solid majority of Americans in each of the two annual surveys agreed with the statement, "Almost everything we do in modern life harms the environment." More important, Americans appear to have lost confidence in our capacity to solve environmental problems by relying on science and technical know-how. Only 20 percent of the respondents in both surveys thought that "Modern science will solve our environmental problems with little change to our way of life." No doubt this reflects what seems to be a growing skepticism about science. Fifty-five percent of all respondents agreed with the statement, "We believe too often in science, and not enough in feelings and faith." And, as if to emphasize the importance of faith, nearly 80 percent said that "Human beings should respect nature because it was created by God." Given this set of beliefs, it should not be surprising to learn that just over half of all respondents reported believing that "Nature would be at peace and harmony if only human beings would leave it alone" see chart 3 in the appendix.

Landa collected recently by a team of anthropologists allow us to fill in more details about the ways Americans think about the environment.⁴ They assayed the "environmental values" of five groups of people: members of EarthFirst!, members of the Sierra Club, the general public, workers in the dry cleaning industry and, finally, workers in sawmills.* Though, as one would expect, there are some dramatic differences between the five groups of respondents, what is even more impressive is the degree to which there is consensus on precisely the matters we have been discussing (see chart 4 in the appendix for the complete report). For example, almost everyone agreed that "We have a moral duty to leave the earth in as good or better shape than we found it." Sawmill workers were the only group in which fewer than two-thirds agreed that "Nature is inherently beautiful. When we see ugliness in the environment, it's caused by humans." And they were well outside the fold.

Ranks closed again on the following statement: "Nature may be resilient, but it can only absorb so much damage." Ninety four percent of EarthFirsters agreed, as did 85 percent of sawmill workers. Similar accord was found on this statement: "Nature has complex interdependencies. Any human meddling will cause a chain reaction with unanticipated effects." 97 percent of EarthFirst! members agreed, as did nearly two-thirds of sawmill workers (63 percent). Sawmill workers split from the pack on the question of extinction. Large majorities of the other four groups, ranging from 78 percent to 97 percent, agreed that "Preventing species extinction should be our highest environmental priority. Once an animal or plant species becomes extinct, it is gone forever." Only 41 percent of the sawmill workers agreed. Sawmill workers edged back into the fold, though they still lagged well behind the others when the issue of extinction was rephrased: "All species have a right to evolve without human interference. If extinction is going to happen, it should happen naturally, not through human actions."

Large majorities of all five groups also agreed with the following two

*The samples from each group were not random and so generalizing beyond the respondents themselves is not warranted. Still, the results Kempton, et al. report are certainly consistent with the findings derived from carefully drawn random samples such as those of NORC.

statements: "Humans are ripping up nature, feeling that they can do a better job of managing the earth than the natural system can"; "Humans should recognize they are part of nature and shouldn't try to control or manipulate it." Given this, it should come as no surprise that hardly anyone in any of the five groups had much faith in technological fixes. The most optimistic were, of course, sawmill workers, but even they could only muster 15 percent who agreed that "We shouldn't be too worried about environmental damage. Technology is developing so fast that, in the future, people will be able to repair most of the environmental damage that has been done."

In this context, it is easy to see why the public is increasingly turning against those who log or who argue for the active management of wildlife, especially when management means killing overabundant animals either because they are damaging the environment or are interfering with or endangering humans. We have gone, in effect, from casual disregard of nature to worshipful awe.

Americans have long thought of nature as a storehouse or a cupboard from which they could draw all that suited them. Beginning around the middle of the nineteenth century, after a long orgy of ransacking the cupboard, Americans began debating whether access to the cupboard ought to be restricted and regulated and how this could be accomplished. The conservation movement, as it came to be called, tried to encourage restraint: making fewer and more careful trips to the cupboard and resisting the impulse simply to empty the shelves. The idea, as put forward by men like Gifford Pinchot, was not to shut the cupboard door but rather to end wastefulness and uncontrolled exploitation of natural resources. With better scientific understanding and improved techniques of resource management, Pinchot and his followers were confident that consumption and replenishment could be balanced. The rhetoric of conservation and of sustainable yields reassured Americans that the cupboard was safe. In the last three decades, however, support for this venerable notion of conservation has waned, gradually at first, but then accelerating rapidly. In its place, the desire to treat nature less as a cupboard and more as a "living museum" has grown. Not too long ago environmentalists thought of themselves as stewards who watched over nature lest its regenerative capacities be

compromised. Now environmentalists are just as likely to think of themselves as curators: like all curators, they want to add to their "collection" or, at the very least, keep what they have intact.

The continuing conflict over the management of our flagship park, Yellowstone, though more complex, nonetheless parallels the Quabbin controversy. Under the leadership of Starker Leopold, a son of Aldo Leopold, the National Park Service adopted a system of "natural regulation" for Yellowstone which has been in force since the late 1960s. The aim was to allow nature free reign on the assumption that, if left alone, the park would in time come to resemble the landscape that greeted the first white men who looked out over the Lamar Valley. Indeed, park historians and biologists worked hard to figure out just what this "original condition" might have been. It turns out to be no simple matter, not least because a lot of crucial evidence is missing. As with so many things about the natural environment, we do not have good data over long enough stretches of time to know if this or that condition is typical or transient, part of a long repetitive cycle or a chance event.⁵

This uncertainty means, in the final analysis, that favoring natural regulation is really a gentle way of saying that we should be prepared to take what comes, a point many of the critics of the MDC made: instead of imposing our preferences on nature, we should learn to accommodate to whatever nature sends our way. Natural regulation depends upon our willingness to accept fires, floods, periodic heavy winter kills, blights of one kind or another—the usual suspects. In general, we have been willing to "let things go" only in places that don't otherwise hold much interest, places like vacant lots, degraded landscapes, or acreage that offers no commercial or recreational attractions. But in places like the Quabbin, where a water supply is in the equation, or Yellowstone, a destination for millions of summer vacationers intent on seeing some of nature's most wondrous spectacles, a principled indifference to the erratic whims of nature is hard to sustain.

Proponents of natural regulation see silver linings where others are inclined to see dark clouds. The fires that swept across Yellowstone in 1988 are now heralded as unleashing a virtual flood of regeneration and species diversification. The staff at Yellowstone has labored long and

hard to assuage the dismay of park visitors when, even ten years after fires swept the park, they look out on a scene whose most striking feature, from a distance, is charred remnants of once majestic stands of lodge-pole pine. Beneath these skeletal remains is a verdant carpet of early successional growth. Although that's not what tourists notice, those who are knowledgeable do see the wildflowers, brambles, and young shoots as harbingers of recovery. John Varley, the longtime chief of scientific research at Yellowstone, is struck by what he sees growing now that the dense canopy has been opened to the light. "I was hiking the east side of the park," he reports, and "I ran into mountain hollyhock. I've been here twenty years, and I've never seen a single one. There was a hillside covered with their lavender blooms—so many of them it was too thick to walk through."⁶ And there is surely more food for the large mammals who inhabit the park.

It is instructive, in this context, to reflect on the difference between the way in which fire and logging have been treated by the environmental press. Clear-cuts are excoriated—they are routinely depicted as a scourge, creating a wasteland where once there was abundant life. Not only are clear-cuts called an abomination to the eye, they are also held up as examples of how wantonly we are stressing the regenerative capacity of the earth.⁷ By contrast, fire is now celebrated as nature's way of renewal, at least when the fire is sparked by lightning, not careless campers. I would not claim that fire and clear-cutting are equivalent, but in most instances I would wager that the different biological impacts of cutting versus fire are far smaller than the blanket condemnation of the former and the blanket embrace of the latter would suggest.*

The visual results are certainly similar. But imagine the outcry had it been chainsaws, not lightning, that had made way for the explosion of biotic variety and vitality that Varley and others are thrilled to be witnessing. The lodge-poles pine will return, in time. Experts estimate that roughly two hundred years from now, maybe even sooner, visitors to Yellowstone will once more gaze out over an expanse of tall pines. In

* I fully appreciate the claim that fire and clear-cutting have different ecological implications—and that, to make matters more complicated, the implications are different in different regions and climate zones and for different soils and topographies. Still, it is worth reflecting on our recent willingness to accept fire and reject logging.

New England, it takes half that time for an area to become reseeded. (Remember, the Quabbin was heavily cut over—and then blown over by the hurricane of '38—a mere sixty years ago, and it is now admired for its wilderness qualities.) And yet, opposition to *clear-cutting* is as intense in New England as it is in the West. Storms, fire, disease, and saws are all "enemies" of a forest and each introduces different stresses and produces a different kind of vacuum. But, ironically, were it not for these sources of disturbance, our forests would be host to a much narrower range of flora and fauna than we now expect to find.

Yellowstone, because it is a park, can be left to natural regulation if the public is willing to take what comes. It is certain that whatever comes, there will be plenty to stimulate the senses and plenty of things that will engender awe in the presence of nature's irrepressible drive to fill in empty spots. This is what some parks, at least, should be all about. But as a general rule, letting nature decide will not work, not even in most parks. We must cut trees; we must keep land cleared for agriculture; we must manage wildlife, which sometimes means protecting them and their habitats and sometimes means killing some of their number. Nature doesn't care if the deer denude a hillside, but we surely ought to.

This said, there is little doubt that we should expand the zone of our indifference to what nature sends our way. For example, we should resist the temptation to build in flood plains or along fragile coastlines or in areas that are otherwise unstable. At the very least, we should not encourage such building by offering federally underwritten insurance against the perils of flood and beach erosion. We should not expect nature everywhere to be made to conform to our wishes. Just as surely, though, we should not be lulled into thinking that only untouched nature is worthy of our appreciation.

If the proponents of natural regulation had only such modest goals as these, only the most enthusiastic developers would object. But, like the critics of the MDC, proponents of natural regulation go further: they wish to see landscapes purified of human presence. Humans are, in effect, written out of the equation. Before natural regulation became official policy at Yellowstone, elk were killed in the park in order to keep their numbers in check. In the late 1960s, when the herd was

estimated to be less than five thousand animals, management of the elk herd was ended, at which point the herd grew rapidly, reaching as many as nineteen thousand by 1988. Then came the fire, followed by a severe winter, and the elk, deprived of browse and shelter by the fire, suffered a huge winter kill. But it was not long before regeneration began providing browse again and the herd quickly rebounded, and now numbers, according to Paul Schullery, a noted historian of the park, at least twenty thousand. Though there is still intense debate about whether the park can sustain this many elk without their having adverse effects on other aspects of the park's ecology, there is little disagreement over the fact that the size of the elk herd reflects a key missing ingredient in the Park's ecosystem: predation.

Wolves, along with humans, historically exerted a major influence on the elk. Wolves began to be hunted, trapped, and poisoned all across the West in the early decades of this century in a systematic campaign to rid the range of this predator in order to make the world safe for livestock. Though early conservationists, including the elite hunting organization Boone and Crockett, opposed the effort, anti-wolf hysteria overpowered reason and wolves were pursued mercilessly, even when livestock were not at issue, as in Yellowstone. By the late 1930s, the wolf was eliminated from the ecology of Yellowstone, and with much tighter control of poaching as well, only the annual harvest of elk by park personnel kept the herd in check. When that practice ended, and there was nothing to stop the elk from increasing their numbers, the idea of bringing wolves back to the Park soon began to surface.*

The saga of restoring wolves to Yellowstone is a compelling one, at times more a courtroom drama than an ecological project. There are many fine accounts, among the most readable of them Thomas McNamee's *The Return of the Wolf To Yellowstone*.⁸ We need not consider the full story here, but we should note one crucial feature of the

*Although supporters of the wolf restoration think that wolves will control the elk herd, no wildlife biologist whose work I have read or with whom I have spoken is sure that such a plan will be successful. Indeed, the experience in Minnesota with wolves and white-tailed deer clearly indicates that wolf numbers and deer numbers are, at best, very loosely correlated. The relationship between predator and prey is, as Borkin and others have noted, by no means straightforward. But this complexity has not kept partisans of wolf reintroduction from intimating that reintroducing wolves will return things to balance.

thinking behind the idea of natural regulation. McNamee, a rancher, former president of the Greater Yellowstone Coalition, and a strong defender of the wolf reintroduction, describes the park and its environs as follows: "Yellowstone Park is . . . the geographic, ecological, and spiritual center of the largest remaining essentially intact ecosystem in the temperate zones of the earth—the heart of an 18-million-acre complex of wildlands. . . . It is recognized here that the single most powerful absence for the Greater Yellowstone Ecosystem—what demands the cautionary adverb in 'essentially intact'—is the absence of the ecosystem's only missing component, the wolf." The wolf is so powerful a symbol that it is easy to overlook the fact that McNamee, no doubt without malice, conveniently writes humans out of the definition of "intact ecosystem." In his ecological zeal, he has done what the earliest European settlers did when they described this continent as a vast, empty new world.

Of course, the New World was no such thing. Humans had been exploring and exploiting virtually every nook and cranny of the continent long before Europeans even dreamed of the New World. And this is precisely the rub—to speak of intact ecosystems without factoring in the ways *Homo sapiens* have, for the past ten thousand years or so, intentionally and unintentionally altered things is both bad history and bad ecology. In our present mood, this is precisely what happens over and over again—things can be right, it is assumed, only if humans are erased from the scene.* Once we get all the pieces put into an order that suits us, then we can sit back and admire the living museum, conveniently overlooking the fact that we are admiring our handiwork as much as we are witnessing nature's wonders. Moreover, preserving habitat with the presumption of intactness leads people to believe that once stewardship is set aside, the need for it disappears. After all, intact ecosystems take care of themselves, don't they? Consider the wolf yet again.

*Least there be any misunderstanding, I am not attacking wolf reintroduction. Far from it. I think the extirpation of the wolf was a sad and foolish thing and I support efforts to reestablish wolf populations. But as will be clear shortly, reintroducing wolves will not relieve us of the need to manage wildlife. In fact, it will simply add wolves to the already growing list of wildlife species requiring management.

The successful reintroduction of wolves to Yellowstone Park will likely result in a more biologically dynamic situation as well as greater biological diversity.* But it will also result in the steady dispersal of wolves beyond park boundaries and, eventually, into ever more marginal habitat and into closer proximity to cities and towns. The reason is simple: wolves are territorial and hierarchical. This means that adolescents are sent packing, even if there is more than enough food within the parents' territory to support an ever larger brood. Abundant food, such as the park will provide for a long time, reduces the territorial needs of each pack, so the park for some time is likely to be home to a greater density of wolves than in northeastern Minnesota, where the largest natural population of wolves in the lower forty-eight resides. In Minnesota, packs require between fifty to one hundred square miles, roughly, but defended territories have been known to be as large as two hundred square miles. Pack size also varies as a function of food supply as well as variations arising from the social dynamics of particular packs and idiosyncracies of pack members. Most packs do not exceed eight individuals (though packs as large as twenty-one have been recorded).

The fact that there is great habitat for wolves in Yellowstone has meant that the reproductive rates of the transplanted wolves have been high and is likely to remain high for years to come.† Whatever variation develops from year to year will be a function of weather, disease,

*Although success has to be tempered a bit. Even though the biological fate of the wolves seems quite secure, their legal fate is clouded. In a suit brought by cattle interests and partisans of *Wise Use*, to which some environmental groups added their support, a federal judge found in favor of the opponents of the wolf reintroduction. Then the U.S. Fish and Wildlife Service, in order to gain support from ranchers, agreed to call the transplanted wolves an "experimental population." This meant that the wolves were not protected by the provisions of the Endangered Species Act and, should a wolf be found killing livestock, it could be killed. Were it protected by the ESA, killing it would be a serious crime, no matter what it had done. The plaintiffs argued on appeal that there were some indigenous wolves on the scene and that it was impossible to distinguish between the "natives" and the "transplants." Lowering the protection of the transplants necessarily lowered the protection of the natives, who truly were endangered. Thus, they claimed, the reintroduction violated the ESA. As of this writing, the case is still on appeal.

†Of course there will be year-to-year variations in wolf numbers, just as rates of reproduction will vary. An especially hard winter or late spring can affect litter size and survival of newborns. Territorial disputes between packs will also affect wolf numbers. One pack has already been decimated by another pack. But as long as elk remain abundant, the wolves in the park will prosper.

fluctuations in the abundance of species that wolves prey upon, and wolf mortality from other sources, such as other wolves or competing predators. (Nineteen ninety-eight, for example, appears to have been a poor year for wolf reproduction.) High rates of reproduction will inevitably mean that young wolves will be on the move seeking territories of their own. Though there can be no certainty about when wolves will begin dispersing beyond the park (as opposed to sojourning outside the park, which has already occurred a number of times), or in what annual numbers they will be leaving, there is no doubt that dispersal will occur. How will these wolves fare, far from their "intact ecosystem" home in Yellowstone? Will the broad public support currently enjoyed by the wolves continue when wolves begin showing up in the suburbs of Denver? Whatever their fate, they will almost certainly be the center of disputes not unlike the struggle over deer at the Quabbin.

The wolves will dramatically—but hopefully not tragically—illustrate a point all too easily overlooked: there are no borders around so-called intact ecosystems, a fact which calls into question the usefulness of the term ecosystem itself. Moreover, if ecosystems are not bounded in any rigorous sense, then concepts such as intactness or integrity begin to lose their bite. Our fascination for the seemingly intact wild obscures the larger challenge we face: the challenge of figuring out how to be better stewards. Sooner or later, the Yellowstone wolves will pose exactly the same predicament that wildlife officials in Minnesota face.

When the Endangered Species Act was passed and the Minnesota wolves were listed as endangered, there were several hundred wolves in Minnesota, concentrated in the deep woods north and west of Lake Superior along the Canadian border. Now, twenty five years later, there are several thousand wolves in Minnesota and several hundred more in northern Wisconsin and in the Upper Peninsula of Michigan, these latter populations founded by wolves dispersing from northern Minnesota. (One wolf is known to have dispersed 550 miles away from its home base in northern Minnesota!) The wolves have expanded in successive concentric rings south and west from the northeastern "seed bed" and now are within an easy day's lope of Minneapolis-St. Paul.

David Mech, the best known of the nation's wolf experts and a close student of the Minnesota wolves, shocked a recent gathering of experts

and citizens interested in the prospect of reintroducing wolves to New York's Adirondack Park when he bluntly noted that three hundred to five hundred wolves would have to be killed annually in Minnesota if wolves were to be kept safely away from the Twin Cities and from the farms that blanket the southern part of the state.⁹ In short, having protected the wolves in habitat that was ideal for them, we are now faced with agonizing and almost certainly deeply polarizing management choices. Preserving wildlife and their habitat does not get us out of the business of stewardship, but the preoccupation with preservation clearly has made stewardship more controversial, more politicized, and thus much more difficult. To make matters worse, the successes we have had in bringing back wildlife species and in restoring habitat have made stewardship all the more necessary, precisely as the stewards get more embattled.

A similar point was made recently by William Cronon, one of the nation's leading environmental historians. In "The Trouble With Wilderness; or, Getting Back to the Wrong Nature," Cronon questioned the wisdom of the environmental movement's long preoccupation with wilderness, particularly the tendency to define worthy landscapes almost entirely by their closeness to the nineteenth-century ideal of the sublime: craggy peaks overlooking a serene, almost pastoral, verdant valley, a heady mix of the overpowering force and benign fecundity of nature. With our eyes thus filled, Cronon averred, we are less likely to be moved to value the more prosaic landscapes in which most of us live and work. Compared to the Grand Teton or the Lamar Valley or Yosemite, most places look hopelessly uninspiring if not defiled.

For his pains, Cronon has been roundly excoriated in the environmental press. What we need, his critics all seem to agree, is more wilderness. Among the most thoughtful of Cronon's critics is a colleague of his in the environmental studies program at the University of Wisconsin, Madison, botanist Donald Waller. Waller makes a strong case for creating very large, and wherever possible *unbroken*, expanses of "wildlands," land that is exposed to the bare minimum of human presence and, if it is to be managed at all, managed in the most minimal way possible.¹⁰ Waller's wildlands, while not exactly "wilderness," share important features with wilderness: the presumption of intactness, the

removal or drastic reduction of human presence, and reliance on the capacity of nature to be self-organizing and naturally regulated.

On the face of it, Waller's proposal seems compelling—who would not want to see large swaths of prairie stretch once more across the Midwest or large unbroken tracts of mature forest such as greeted settlers' eyes as they spread west into Michigan, Wisconsin, and Minnesota? And who among us does not share Waller's curiosity about what happens in such places over time? How do plant dynamics differ from conventionally disturbed areas? What happens to deer populations or song birds? Do undisturbed areas generate more or less biological diversity than areas less insulated from human activity? As laboratory, inspiration, or balm, wildlands have much to offer. But then come the mundane, practical issues. Where do we find the money to buy the land or compensate owners for restricting the range of uses to which they can put their land? The issue of money is made more pressing because activities that currently generate income from the land would have to be significantly reduced if not eliminated altogether.

There is now an opportunity to create in northern New England a wildlands of the sort that Waller proposes. Paper companies own millions of acres of forest in a broad belt that runs along the border with Canada from eastern Maine to the Adirondacks in New York State. While some companies have practiced (more or less) sustainable yield forestry, many more essentially have cut with little thought to the future. These companies now own large tracts of forest that will not be commercially harvestable for decades (though they are anything but wastelands—new growth is abundant and makes much of northern New England good habitat for deer and moose: hence the burgeoning population of moose in southern New England, of which we have already spoken). In the language of business, the land has become a “nonperforming asset.” Extractive industries like the wood products industry are notoriously short-sighted and, in a word, impatient. No executive in his or her right mind looks favorably on nonperforming assets. So the orders are going out: sell the land. Since 1995, several million acres of northern forest land have been put up for sale. While there is little chance that this huge expanse would be cleared for human settlement, it is distinctly possible that the forest could become pock-

marked with vacation enclaves, eventually inviting more intensive development and complete fragmentation of this extensive forest. Preventing this will require large sums of money, money that the affected states' coffers do not contain. Maine, in which the bulk of the northern forest lies, has a paltry \$3 million in reserve for land acquisition, and Vermont and New Hampshire have even less.¹¹ Only the federal government has the resources to insure that the Northern Forest does not become just another resort and condo opportunity. Indeed, the money is there, in the bank, as it were.

Each year the federal government takes in a little less than a billion dollars from offshore oil and gas royalties. The money is dedicated to the Land and Water Conservation Fund which was established to buy land important for its recreational potential or its ecological importance. Unfortunately, the Republican-dominated Congress has generally refused to appropriate money from the fund, preferring instead to keep as much land as possible in private hands. Taking the public out of the market has meant that the field is largely open to speculators only. Given the time it will take for the forest to become marketable, some private buyers almost certainly will cut what they can and run, rather than wait for the trees to grow. This can only mean resorts and intensified recreational developments. Indeed, in the fall of 1998, Plum Creek Timber Company, a corporation known for rapid timber harvests followed by a strategy of subdivision and resale, bought roughly a million acres of northern forest lands in Maine.

Defensive land purchases are not completely out of the question, even with tight hands on congressional purse strings. In early December 1998, a package of state, federal, and private money was put together by the Conservation Fund to buy 300,000 acres of the northern forest, mostly in New York and Vermont. The \$76 million deal will set aside roughly a third of the total land with the remaining 200,000 acres to be sold or leased under strict sustained forestry restrictions. This model, should it become more widely adopted, holds real promise in that it balances the desire for preservation with the needs of local residents, the more general need for forest products, as well as the need for recreational access to our forests. But as welcome as the Conservation Fund deal is, these kinds of purchases will be too few. Without a

large federal presence, there simply are not enough dollars around to outbid corporations like Plum Creek.

Money is not the only challenge facing people interested in keeping what remains of our forests out of the hands of subdividers and developers. Environmental groups, most notably the Sierra Club as well as New England-based RESTORE: The North Woods, have launched a campaign to set aside 3.2 million acres of forest in Maine as a "Maine Woods National Park." The goal is to establish a "working ecosystem" instead of a working forest, one that would "protect the self-determining processes of a healthy, diverse ecosystem that generates biological diversity and ecological integrity."¹² By now, it should be clear just how much mischief is masked by this sort of thinking. Never mind that no one knows what a healthy or diverse ecosystem is; never mind that we cannot define ecological integrity. Instead of seeking enlightened restrictions on forestry practices, these groups are pushing to transform the north woods from a "working forest" into a destination for ecotourism. The goal of this sort of environmentalism is to remove humans as participants in ecological processes and make us spectators. But spectators need wood products too, as well as gasoline, highways and airstrips, motels, and towers to make their cell phones operable, to name only a few of the things that ecotourism brings to places that boast of being wild. It is far from clear that spectatorship is to be preferred over participation.

The central problem with this way of expressing environmental concern is that it undermines social support for stewardship. It makes suspect all attempts to manage resources, no matter how thoughtful or conscientious the attempt may be. Worse, it obfuscates our intimate dependence on nature. The result is self-deception of the sort that Thom Kyker-Snowman spoke of when he expressed frustration with the well-intentioned people who want all rivers restored to their former free-running condition. Absent hydro-generated electricity, we will be driven even further into dependence on fossil and nuclear fuels. By the same token, opposition to logging our forests, when successful, will only mean shifting logging operations to countries where there are weak, or worse, no environmental regulations. We need, instead, to debate how we use, not whether we should use, natural resources.

Holding up the ideal of ecosystems undisturbed by humans as the model of what environmentalists should seek is likely to drive the wedge between us and the natural world even deeper. It is hard to see how the natural world will benefit.

Given our voracious appetites and growing numbers, each time we restrict the uses to which a particular area may be put, we increase pressures on the rest of the landscape. Some years ago, when the federal government closed the nuclear weapons facility at Hanford, Washington, and for the first time openly confronted the fact that fifty years of weapons production had irretrievably contaminated the area for hundreds if not thousands of years to come, an official resignedly suggested that the area be regarded as a "zone of national sacrifice." Were we to set aside appreciable tracts of land, would we then have to exploit more intensively the nonreserved areas, making them, in effect, zones of national sacrifice? Protection and restoration are crucial to a strategy of caring for the environment, but they cannot be the only ways we display regard for the environment. And given the inevitable trade-offs, it is by no means clear that these expressions of environmentalism, however uplifting they may seem, ought to occupy as much of the stage as they do now.

More than practicalities and trade-offs are involved. In effect, the environmental movement is in danger of being hijacked by people who believe that the only good environment is one rid of human influence and the only true environmentalism is an environmentalism that tries to keep things in their natural state. Elevating "curatorship" over stewardship has the potential of squandering the public's support for environmentalism. Ironically, it also means that both "Wise Users" and "No Users" wind up disparaging efforts to manage natural resources consciously for the common good. More and more of our environment is held hostage precisely in this way.

Back from the Brink

We do not have to let ourselves be captive of either "Wise Use" or "No Use." Reckoning with our many losses, we ought to continue to develop and refine our capacity to reclaim and reinvigorate habitats and,

where appropriate, reintroduce locally extinct species of wildlife. But we should be careful not to fool ourselves into thinking that we are in fact putting Humpty Dumpty together again. Whatever things were like before Europeans arrived, it is certain that we will never recapture that condition. We can replicate certain features of that world, but we will never be able to reproduce the biotic circumstances in which nature functioned five hundred years ago. Too many of the variables involved have been irrevocably altered. Some plants and animals are more numerous now than they were on the eve of European settlement, among them white-tailed deer; others are less numerous; and some have vanished altogether. Moreover, the list of new entrants, so-called exotics, grows steadily as commerce and travel link local environments to one another just as surely as our alliances and trading patterns link humans as never before. Even if all new development, logging, fishing, and hunting were now to be stopped, the cumulative impacts of our activities over the past several centuries has significantly changed the mix, the raw ingredients, and thus the course that nature would take left to itself. Even if we had all the pieces, our assembling them would be more akin to the random patterns of a kaleidoscope than anything approaching a replica of the past.

Again, the Quabbin is instructive. Even with the hunt, there are almost certainly more deer on the Quabbin Reservation than there were when the first English settlers arrived in the Swift River Valley. This means that the dynamic interaction between flora and fauna is now different from what it was then. Moreover, the huge body of water we have created there affects everything else—from micro-climates on up. Similarly, it is likely that because of our recently arrived at (and still precarious) solicitude for wolves, there will be more wolves howling in Yellowstone than ever serenaded the indigenous peoples who lived in and moved through the area.* More wolves, a tiny fraction of the former bison herds, thousands of head of livestock around the park,

* Daniel Botkin's careful reading of the journals of Lewis and Clark reveals that the expedition encountered wolves very infrequently. Of course it is impossible to know for sure how large the wolf population was two hundred years ago. Nationwide, there were obviously many more wolves and they were found in every state (or what were to become states). But that is not the same as having concentrations of wolves in a few areas. See Botkin, *Our Natural History*.

and millions of tourists each year might all add up to an "intact ecosystem" in some peoples' eyes, but it surely bares scant resemblance to what things were like two hundred or more years ago. And even though we will never know what the Quabbin or Yellowstone would look like now had we never set foot in either place, we surely know enough to know that the course of natural history in these places has been fundamentally altered by our presence.

This is not to disparage all the good work being done to restore habitats. There are many promising efforts underway to boost the recuperative capacities of nature. The *New York Times* science writer William K. Stevens has chronicled the efforts of a group of biologists and environmental activists, marching under the banner of restoration, who are intent on bringing back as much of the original prairie as current land use can accommodate.¹³ Two other science writers, Stephen Budiansky and Gregg Easterbrook, have made even stronger cases for what can be done when the recuperative powers of nature are harnessed to science and careful environmental and resource management technologies.¹⁴ Budiansky and Easterbrook have been denounced in most of the environmental press, a press that seems resolutely committed to juxtaposing man-made travesties to unspoiled natural wonders, as though there can be nothing of worth in between the two.

The idea of restoration is not exactly a new one, though the range and ambition of many recent restorative efforts have given restoration a new cachet. The restoration of wildlife populations has, for example, been a goal of the state and federal agencies setting wildlife policies since the passage of the landmark Lacey Act in 1900. At first, efforts were directed almost entirely at reclaiming habitat and restoring wildlife species of interest to men and women who fish and hunt. Indeed, protecting game species from overexploitation and replenishing the stocks of those species that had been overharvested was one of the main motivations for the environmental policies of Theodore Roosevelt and the early promoters of conservation. Following in this tradition, state and federal wildlife agencies began concerted efforts in the 1960s to restore wild turkeys to much of their former range, and in most of these areas turkey populations are now robust, so robust, in fact, that in some areas people are beginning to complain about nuisance turkeys. Mi-

Waterfowl numbers similarly had been heading precipitously downward in the middle decades of this century, largely because agricultural practices were destroying the wetlands the birds needed for nesting. But government as well as private efforts have gone far to slowing and in some areas reversing the loss of wetlands, and as a result, the populations of most waterfowl species are at least stable and some have grown. Indeed, the rebound of one bird, the snow goose, has been so marked that it is now threatening to displace many other species of geese and ducks. Efforts to boost the white-tailed deer population have also been embarrassingly successful. Management of habitat and, in some cases, reintroductions have also spurred the spread of beaver and moose over more of their former range. In the East black bear populations are climbing, and in the West there are signs that the grizzly may be staging at least a modest comeback.

Game animals are no longer the only creatures whose numbers and range are deliberately being augmented. Spurred by the Endangered Species Act, nongame species have approached their rightful place in public wildlife policy. The bald eagle and the peregrine falcon have been brought back from the brink, as have a number of other species, plant and animal. Our air and water are cleaner now than they have been in decades. While some major fish stocks are at or near crisis levels, others, like the striped bass, have rebounded vigorously as a result of concerted efforts, both public and private—perhaps, one hopes, an indication that other fish species might also recover if we act appropriately.

Though these and similar efforts are encouraging, no one should imagine that the cumulative effects of the last ten thousand years of human appropriation of nature can be undone. Many life forms have become extinct by virtue of our adaptive success, and it is clear that even with the best of intentions, and an unimaginably concerted effort, many more species will disappear by our hand. These losses will lend urgency to the desire for protection and recovery. Herein lies the danger—if we are too indiscriminate in our efforts, we will surely exhaust ourselves by trying to do more than is humanly possible; if we are too narrowly selective, if we focus our efforts only on a few charismatic species and inspiring habitats, we run the risk of making things worse.

Hubris can be a source of grief, whether it leads us to pursue features away or to bring them back. Right now, public perception clearly favors bringing the wild, in most if not all its forms, back. How long this will be so remains an open question.

The reason for concern is straightforward. Our current embrace of the wild is laying the basis for myriad conflicts between the wild and humans. We have already noted some points of nagging friction: white-tailed deer, of course, but also “nuisance geese” and soon-to-be-nuisance turkeys as well as beaver.* This list now is much longer and is growing steadily. We can add coyotes in New England, a non-native to the region, as well as black bear and moose. Mountain lions in the West are destined to become a problem, especially if other states follow California’s lead in banning the hunting or trapping of the big cats. The problem is parallel to the problem of wolf in Yellowstone: we have deliberately or unintentionally been promoting wildlife in prime habitat. But good habitat, as we have seen with wolves, serves as a seed bed for animals who will have to disperse or have their numbers kept in check—or the habitat will cease being good. However balanced and harmonious people imagine wild nature to be, it is neither balanced nor harmonious when city parks, back yards and median strips become the adopted homes of animals sent packing by biological necessity.

Belief in the harmony of nature runs deep and is clearly one of the most powerful metaphors governing our sense of the natural world. As we have seen, critics of the MDC faulted the agency for the “deer problem.” Nature would have evened things out and everything would be fine if only we had left things alone. This view of nature makes confronting the reality of our interactions with the wild all the more troublesome precisely because it threatens to cripple policies and practices designed to reduce friction between the wild and humans. We encroach on the habitat of wildlife and they, in turn, encroach on our

*Richard Nelson has provided us with a comprehensive analysis of what might be called “the moral career of the white-tailed deer” in *Heart and Blood: Living With Deer in America*. As cities and park authorities grapple with wildlife problems, a new industry is emerging: trappers, sharpshooters, and specially trained archers whose service is to rid an area of its troublesome animals. For a recent news story about one such operation, see Andrew C. Revkin, “Coming to the Suburbs: A Hit Squad for Deer,” *The New York Times*, November 30, 1998, A1, A5.

turf. It would be nice to adopt a live-and-let-live position, but that turns out to be far more easily said than done. Such wishful thinking will only insure the increasing frequency of negative encounters. Over the long run, as these negative encounters multiply, we might well witness an abrupt return to fearing and loathing the wild. Even if we and wildlife are spared that outcome, it is almost certain that the consensus that now exists about the environment will be shattered as communities do battle over how to cope with beaver, geese, coyotes, and all the other critters who are lighting up police switchboards across the country.

We are on a collision course with wildlife. This has been so for roughly the past ten thousand years, the approximate moment when *Homo sapiens* began to turn from foraging to agriculture. We went from passing among wild creatures to displacing them to make room for our domesticated plants and animals. Even with the best will, it is clear that this collision is unavoidable. The best we are likely to be able to do is to blunt the impact here and there. For those species that can adapt to the environments we create and those that thrive on disturbance, the prospects are not necessarily bad, especially if they can count on our continued solicitude. For others, however, the future does not look bright and I dare say there is little more than hand-wringing that we can realistically offer. Those who think that we are headed for some sort of ecological crash may be right, though I suspect visions of apocalypse are overwrought. If they are right, however, it seems unlikely that we can alter our course quickly and radically enough to avert disaster.

More likely, our choice is not between ecological collapse or learning to live in harmony with nature, but rather between trusting to nature to work things out or accepting our fate as stewards. As stewards, we should endeavor to sustain as richly diverse a biotic neighborhood as we can—for aesthetic, ethical, and scientific reasons. But we also must accept the fact that this entails a heavy dose of management. Trees will be harvested and animal populations will need to be controlled. If we attempt to adopt a "live and let live" stance, attitudes will harden and cleavages will deepen. Just listen to the people who own lakefront property on lakes afflicted with a resident goose population or folks

whose subdivision was built near a wetland that is now colonized by beaver. Nature will not resolve such conflicts as these because, as far as nature is concerned, there are no conflicts to resolve. These are our conflicts, and it is up to us, and us alone, to resolve them.

We can do this only by being active stewards, not spectators. We have the rich variety of wildlife we currently enjoy precisely because we intervened actively in behalf of wildlife, manipulating their numbers when one species became too numerous, throwing a blanket of protection over species when their numbers got precariously low. For all our mistakes, both of omission and commission, there simply is no other way of proceeding. For better or worse, we are in charge. If we abdicate, we are likely to hand over to the generations to come a much less richly diverse planet than the one we now have. We'd be fools to put the fate of the environment, at this late date, in the lap of nature.