

SECTION II

Human Components of the Sierra Ecosystem



The Public as Agents of Policy

ABSTRACT

Looking at landscape alteration as the basic evidence of human activity is a far more effective technique for capturing policy change than relying on written laws or formal policy documents. Changes on the land are generally vernacular—driven from the ground up—and such changes are a sophisticated barometer of policy need and local ideology. Accepting the vernacular environment as a basic analytical unit has an added advantage; it bonds scientific investigations and expert efforts at establishing baselines to the visible and concrete expressions of human artifice in material culture. Although policy periods are often ossified into dated eras as a simple bounding device and a historical convenience, concern with the evolution of landscape—something that is much akin to “an ecosystem”—requires accepting different, especially physical and cultural, evidence. Vernacular policy is fashioned by local people to meet their everyday needs for order and resource exploitation, and to protect residents and landscape. Because policy throughout much of the Sierra is at best inchoate, the biggest contributor to policy has been official and administrative abstinence and abdication. Yet policy by inattention and inaction paradoxically is an active form of policy making, and inaction is not always picked up in a formal policy analysis or history; these are, after all, generally produced by policy analysts, economists, or historians, who are most comfortable evaluating written fact rather than changes on the land. The advantage of landscape-level studies is that they examine the substance of change, regardless of the initiator. Ultimately, there are dual authorities, producers of quite different kinds of landscape change: the influential establishment forces and the vernacular “doers.” These two vessels for policy assessment, and their direct implications for the Sierra Nevada ecosystem, are examined.

INTRODUCTION

Geography is writ large in the policy past, present, and future of the Sierra Nevada ecosystem. The Sierra Nevada is seen in various lights by its diverse perceivers. Through time the Sierran realm—more than 640 kilometers (400 miles) long and up to 160 km (100 mi) wide—has been appraised as home, as impediment, as an enormous pool of natural resources awaiting exploration and exploitation, as a setting for the playing out of sundry human ambitions, as the place for parks and historic preservation, or, in the view of some, as a paragon of the pristine. There can, of course, be endless wrangling about the precise meaning of these ambitious, changeable, and contradictory visions, and a big helping of contentiousness about what exactly such cavalier classifications imply is not unexpected. Yet policy as it has evolved (and failed to develop) in the Sierra of Nevada and California owes more to geography than to an orthodox history.

Foreword—the Portents of “Policy”

Although there is room, especially in policy studies, for dispute about the neatest way to understand the Sierra Nevada—how policy-making eras and their thematic historical categories are best arranged—setting a geographical anchor is a handy way to slow down any drifting. The history of the Sierra can be treated as a phalanx of time-discrete events, but its geography is thoroughly intermixed and eventually built upon alterations that have a real physical form and a permanent and discernible effect on the land. The distinguished French author of the Annales school, Fernand Braudel, has put it nicely: “Landscape and panoramas are not simply realities of the present but also, in large measure, survivals from

the past. Long-lost horizons are redrawn and created for us through what we see; the earth is, like our own skin, fated to carry the scars of ancient wounds" (Braudel 1988, 31). The study of landscape modification is a basic stock of geography and its far younger and as yet malleable discipline of environmental history. Connecting these twinned fields to the policy climate of the Sierra is hardly a stretch. But history and geography are separated by conspicuously different views of the importance and mechanics of how policy is shaped.

The founder of *Landscape* magazine, J. B. Jackson, has written about a fundamental split in American life between what he calls "establishment" and "vernacular" views, and the implications of these ways of seeing speak not only to how landscapes like those of the Sierra are regarded, but also to how they are treated, handled, and seen to have evolved. Policy is, naturally enough, the primary province of establishment figures; they make policy trying to ensure that landscapes evolve in certain ways and not in others. The wishes of elected policy makers in a democratic society are set down in debates and hearings; the results of deliberations are chronicled in judicial decisions, legislation, executive orders, and regulations.

But other important changes take place in any landscape. These changes come from the actions and inactions of less self-important and yet at least equally influential forces, representing vernacular views—the needs, desires, and deeds of the everyday residents of a landscape. But despite the distinction recognized in American law between statutory law and common practice as it can be incorporated into law, policy studies have been loath to recognize or perhaps just incapable of recognizing this difference on the ground, where policy is expressed. Vernacular or common folk "create" policy in formal terms only rarely, but they shape landscape (literally) in many and substantive ways, and do so constantly.

This contrast between vernacular and establishment forces has plenty of local and regional expression in the Sierra Nevada. Take, for example, community well-being and governance. Rural sociologists claim with glee and surprise to have discovered in the last fifteen years that western Sierra communities are clamoring for a voice, instituting efforts to create consensus and gain added power over local economies and future options. Yet it is sorely misguided to assert that these demands are anything new. As Rodman Paul and Charles Shinn have noted, the mining camps of the western slope created intricate and entirely oral and tradition-based codes that saw the communities through thick and thin during an era when "legal" and policy authority was impossibly remote in prospect or enforcement (Paul 1963; Shinn 1884).

"Miner's law," whether ruling on claim disputes, access and rights to water, or legal transgressions, was a system of justice and authority that had no formal state or federal sanction. A mining community made itself work. Not perfectly self-equilibrating, mining communities did nonetheless solve most pressing problems on their own. This home-concocted

"policy," if at times cast in a circumspect and extralegal mold, was unmistakably far removed from vigilantism: here was a direct expression of the mining (and town) community's need for order. If on its face "unofficial," the elements of informal control in mining communities were genuine, amounting to a usufructuary policy—born from use, not legal code—that governed community growth and development along the entire western Sierra front.¹ And informal rule did work, while the laws and policies of California and Nevada (to say nothing about those of local counties or the federal government) failed to engage until decades later.

Comparable unofficial forms of policy and community control have steered a multitude of activities besides mining—livestock raising, for example, had the stockgrowers association, based loosely upon the Spanish and Mexican Mesta; logging camps had discrete grievance boards; hunters practiced venery in the foothills when laws to control hunting, whether for sport or market sales, were at best malformed; water was administered through nonstatutory means, admittedly traditional and highly ordered, that were eventually recast into the doctrine of prior appropriation, still important in every western state. The Central Pacific Railroad conducted its sales of checkerboard land with considerable energy and spawned a swelling of forest cutting and town building that had its own private policy. And, of course, the modern-day homeowners association is nothing less than a way to control behavior that, however codified in Covenants, Conditions, and Restrictions, generally preempts law and policy—and establishes practices that are stricter (by association) than those of the surrounding society. In fact, the notion that law and policy are the best means to solve problems, especially those between neighbors, is a notably modern conceit, as Robert Ellickson has suggested with no small measure of sting (Ellickson 1986, 1991). Consistently throughout the history of the Sierra Nevada, improvisation has been the mother of policy and the father of innovation.

The contemporary complaints coming from rural, resource-dependent communities owe much of their volume and vehemence to the organizational skills of relative newcomers who do not realize that their wails of protest are old wine in new bottles (Fortmann and Starrs 1988). Asking for legal and legislative redress has been a last resort throughout much of the Sierra's Euro-American history, and not a first principle. Policy abjured by legislature or Congress, policy that on occasion went unwritten simply because there was no easy means to construct it, has usually been fashioned by local people to meet their everyday needs for order and resource exploitation and to protect residents and landscape. Without pressing into environmental determinism, it can be argued that adaptation to Sierran environments brought about a huge series of improvisatory changes in the use and practices wrought upon the Sierra and its resources.

And it is still that way. The foothills, east and west of the massif of the Sierra Nevada batholith, are changing with great speed and are growing crowded as new human populations

move in (Walters 1986).² Now, for example, a vacuum is being filled that was first breached in the 1950s by tentative and speculative second-home developments around Lake Tahoe, in the Feather River country, and through the foothill central Sierra counties (Parsons 1972a, 1972b). These developments proliferate and pose something of a quandary, in part because there has been little discrete government effort to limit the subdivisions and second homes that John Fraser Hart has described as sitting on the “perimetropolitan fringe” (Hart 1991). Because policy on wildland fire prevention, subdivision, access, and wildlife management along the western side of the Sierra is at best inchoate, the biggest contributor to policy has actually been official and administrative abstinence and abdication. This is not necessarily bad, and it certainly has a long history. But policy by inattention and inaction paradoxically is still very much an active form of policy making, and inaction is not always picked up by a formal history. Looking at landscape alteration as the basic evidence of human activity is a more effective technique for capturing changes than relying on laws or formal policy documents. Changes on the land are generally vernacular—driven from the ground up. Accepting the vernacular environment has an added advantage; it bonds scientific investigation and attempts to establish baselines to seeing a human past that finds its concrete expression in material culture.

So, though policy eras can be ossified into bracketed dates as a historical convenience, concern with the evolution of landscape—something much akin to “an ecosystem”—is different. Landscape-level studies examine the substance of change, regardless of the initiator. Ultimately, there are two authorities, two different kinds of producers of landscape change: the influential establishment forces and the vernacular “doers.”

At times the proponents of science, planning, and orderly progress can be rendered all but irrelevant. Politics, policy, and the improvisations of community and regional forces often surge ahead of science and reason, bringing change to an ecosystem before it is known or understood. That has certainly been the case in the Sierra Nevada. Vernacular forces are a basic fact of landscape change. Improvisation and imagery—how a problem or situation is perceived and how a local constituency chooses to deal with it—have had an enormous influence on the Sierra Nevada, and they still are critically important today. In fact, experts who study the material culture of everyday landscapes are increasingly comfortable with an argument that the built works of a community are frequently a remarkably effective means of understanding the ideas and ideals of the community’s people; as Henry Glassie once put it, “in works are the mind.” The same conclusion can be applied to the backtracking that takes place in analyzing the improvisation of vernacular policy. At a local level, policy is created when there is a significant need of either a whole population or a smaller but influential clique. Vernacular policy is still a remarkably sensitive barometer of community desire or perceived need.

John Wesley Powell ran afoul of Congress in 1878 with his notable “Report on the Lands of the Arid Region” in large measure because he insisted that surveys of arable land, water supplies, forest acreages, and ideal community sites should be completed, with appropriate land set aside into town grants, before settlers moved onto the western lands. That plan lasted a matter of months before Senator Bill Stewart of Nevada interceded to allow speculation and settlement to move forward before surveys were complete (Stegner 1953; Starrs 1988; Pisani 1992). The adventurous practice of charging ahead into a relatively unknown realm survives in American life. Changes in a landscape are made with limited regard for science, and it can take policy makers years to catch on and catch up (Pisani 1992).

The vicious infighting currently going on over the reach of the Endangered Species Act (ESA), as another case in point, is a striking example of a scientific policy in defense of biodiversity that has run up against a local desire to develop and sometimes plunder. The policy, in law and fact, is clear enough; the work-arounds on the ground, including those of the Department of the Interior, suggest that asserting something is “right” for an ecosystem, however that may be determined, generally amounts to a speed bump in the dynamic road of change.³ Placing possibility ahead of policy and planning is in the nature of vernacular activity and, for good or bad, a deep American tradition.

Good “science” may not matter, and even “policy” can be an afterthought. The federal experience with rangeland reform and modification of the 1872 Mining Law are recent cases; California’s involvement with the California Environmental Quality Act and energy policy reform is equally telling. The times when policy actually scripts an orderly landscape change are rare. Instead, landscape change is improvised, even libertarian—conducted beyond the traditional reach of establishment policy making. So studying just the stages of official policy formation turns out to be a profoundly partial choice, and one best avoided.

Policy and the Particulars of Landscape Change

The Sierra Nevada ecosystem has through time been shaped by a variety of landscape changes driven by vernacular and establishment forces. These modifications have a mappable, physical expression; most led eventually to policy changes that signal discrete historical benchmarks. But the time lag between the arrival of settlers or resource exploiters and the formulation of anything like “policy” is usually significant.

There are plenty of cases throughout the Sierra where sizable landscape changes were made (and they still can be) without any recognition at all in law that these require or can be altered by formal policy making. An epoch of sheep grazing across the Sierra; the damming of rivers for small-scale hydroelectric generation and assurance of town water supplies; and thirty years of essentially unbridled foothill subdi-

vision are hardly trivial examples of land use and habitat modification. Policy rarely precedes land use; it is more reactive than proactive. Alas, scientific study as an influence on policy is not often farsighted either, as Donald Worster has pointed out in *Nature's Economy* (1994).

As a case in point, the long-standing influence of Native Americans was certainly a momentous fact of Sierran vegetation and fire history, and remained so until long after Ishi (Kroeber 1976). Indian management of Sierran resources was significant, and in the relatively few sites where there has been elaborate ethnographic study of foothill Indians, or in places like the Valley of the Yosemite,⁴ the evidence suggests that ongoing Indian activity made for telling changes in the land.⁵ But policy followed only slowly. There are good reasons for this. As Slotkin (1973, 1985) and White (1983) have suggested, to recognize the productive and landscape-changing role of Native Americans and then deal with them in law was to create a policy where there was no defense for actions that Euro-Americans were already taking. What happened instead typically involved ignoring the "problem" with a full expectation that with the passing of relatively short periods everything would be cared for (Limerick 1987).⁶ The abdication of policy was a lot easier to contend with than a formal, but indefensible, policy. And so, in the case of the Sierra, it was left to settlers and disease to handle what the laws could not. Inaction is policy, as is a paralysis that prevents consensus. This is by no means unknown today—to put off making policy is itself a choice that avoids the liabilities of after-the-fact blame.

The basic task for this chapter is to look at the Sierra Nevada ecosystem from a geographer's perspective, focusing impressionistically on a single, policy-based question, "how did it get to be this way?" That is no small task, but Beesley's (1996) sizable reconstruction of the Sierra Nevada landscape precedes this effort, and he has completed some admirable spade work. Anyone who needs the dates and particulars of legislated change in the Sierra should have that account at hand. As this introduction suggests, the concerns covered here—literally changes in the land and its inhabitants—are different. The basic organization of the rest of this chapter turns on individual aspects of land and life in the Sierra, with suggestions for the major policies and facts, whether driven by establishment or vernacular forces, that have altered the Sierran landscapes.

The Sierra is divided here into component physical parts, not regionally, but topically. Because there are some resources—roads and passes, communities and property—that are social, rather than biological, they are included. Each part is taken in turn, and I comment on what I see as the most significant policy creations and omissions that have affected the Sierra's elemental resources: rangeland, wildlife, fire, minerals, forests, the hydrosphere, arable lands, movement, recreation, property (or habitat), biodiversity, and the public trust. There is room enough for other resources or issues to be introduced, but a study of the geographical aspects of policy in the Sierra needs to be more than a survey of legislative acts

and judicial opinions. It needs to include a want of policy as well, for to do nothing is, in a government sense, something very important and is itself a conscious act and a reflection of certain decisive values: in particular, it suggests satisfaction with the way things are, or a conviction that nothing should be done, or doubt that any political consensus is reachable.

An analytical frame of five windows is developed, each offering a different vista on the modes and conundrums of Sierra Nevada policy. The themes bear on almost all the resources, environments, and populations of the Sierra. Implantation is concerned with the nature and substance of settlements and exotic introductions in the Sierra Nevada, from Native American times until today. Exploitation focuses on the objective resources of the Sierra, which range from acorns to auriferous gravels, from water to wildlife and wilderness. Tenure examines the cadastre—how land was acquired, the patterns of ownership and use in the Sierra, and the expression in the Sierra Nevada of the familiar American obsession with land and property, including the public trust. Intensity takes on the relationship between core and periphery—some activities develop sizable effects in small areas; others are diffuse but enormously widespread in practice. Finally, the Sierra Nevada ecosystem assuredly does not exist in isolation, and the essential geographical relationship between the Sierra and other places is brought out in a study of linkages. Discussion of these concepts is incorporated into the larger text that follows, but they are as much organizational themes as analytical conveniences, which in any case reach to the heart of the resources of the Sierra Nevada ecosystem and get beyond plain science to an argument that for at least ten thousand years the Sierra has been as much and as significantly a human place as a playground for the forces of biogeography, climate, pedology, geomorphology, and hydrology to work their way.

RESOURCES

Twelve resources are examined. Many overlap, but that duplication will be glossed over. None of these surveys is intended as anything more than an illustration of the dynamic between vernacular and establishment policy forces. It is motive power and inclination that is sought here because policy is not made in straight lines but from subtly shaded or overtly self-serving zigzags of contending and opposing forces. The formal histories of the Sierra Nevada Ecosystem Project (SNEP) are the obvious places to turn for history; here only a sampling of citations for the different fields is offered. But keep in mind that each resource is posed as a talking point, an illustration of how Sierran policy is influenced. Especially important are the first clarion calls for change, because there is an almost Newtonian inclination to leave well enough alone through much of American policy history, with a few rare

exceptions relating to land and agriculture, where the policy of Congress was interventionist indeed. Each locale, even within the Sierra, makes accommodations to local conditions, and the formal policy making of government came later, to broker and modify the vernacular relationship of Sierra residents to the land.

Rangeland

What is not forested or bare in the Sierra Nevada is rangeland, according to the disciplinary definitions of range managers. But even forested areas of the Sierra Nevada batholith have seen significant use by native animals and by introduced (or exotic) herbivores, primarily cattle and sheep.⁷ Animals hunted by Native Californians certainly grazed, browsed, and roamed the Sierra, and were important nearly as much for ritual life as for a protein source. Domesticated animals from Spanish times on were regular visitors to the foothills, and feral horses and burros ranged in the Sierra, brought there by Spanish and, later, Mexican miners, in the early nineteenth century. Feral animals were free spirits, in some cases literal escapees from domestic use, and they formed one more layer of creatures to be exploited in California. From native wildlife to early exotic introductions, through the depredations of gold rush-era market hunting, into the present-day conflicts over water supply, the Pacific Flyway, and the always-discussed “peripheral canals,” there are instructive policy lessons to be gleaned by looking at animals.

Domesticated animals in early California roamed freely and widely. Disputes over ownership were settled by “judges of the plains” who ruled with an authority granted by public stature and their informal acclaim as an elect.⁸ Livestock grazed on commons and mixed freely—the concept of property was profoundly different in Hispanic Alta California than in the eastern United States, a historical incidence of a common property resource that has been insufficiently studied. In fact, almost all laws relating to resources were based upon Old World Andalusian and New World Mexican experience, with Arab North African roots, instead of English common law (except in the specific matter of water use, where appropriate doctrine ruled).⁹ So the Sierra was during the Spanish era a vast potential grazing land, and it was used as such modestly, especially in the western foothill country between 300 and 1,500 m (1,000 and 5,000 ft), where there was plenty of forage and relatively easy herding. Although about 80% of Californio livestock grazing was centered in the Coast Ranges, the Sierra did not go untouched, especially as settlements in the southern Sacramento and northern San Joaquin valleys grew entrenched in the 1820s and 1830s.

A major trait that the Spanish-Mexican experience passed on to Californians in the Anglo period was the importance of transhumance, the seasonal movement of livestock from one foraging ground to another (Rinschede 1984, 1988). Two kinds of transhumance affected the Sierra and went unimpeded by

policy until nearly the turn of the century—and in some respects, these retain significance today.

First was the market movement of animals along the Sierra, either the east or west side, to mine sites. The east, including the Owens Valley and the precipitous eastern escarpment of the Sierra, was the main movement ground for sheep and cattle, as for the drayage animals, including horses and oxen bound for the mines of western Nevada—the superlative Comstock, Bodie, Aurora, Lida, Silver Peak, and later Goldfield, Tonopah, Rhyolite, and Bullfrog. The route available was a relatively narrow defile, because just a little to the east lay Death Valley and its known problems. These animals ate.¹⁰ The same pattern of concentration of travel routes is true for movement (remarkably little studied) along the foothills of the Sierra, moving animals to the Mother Lode and, in later years, to the deep, hardrock mines of the western slopes. For at least forty years these animals ate and trampled, some escaped, and they proliferated; there are accounts of sizable numbers of feral animals doing well along the east and west sides of the Sierra despite the remarkably diverse corps of major predators that roamed parts of the Sierra until relatively late.

A second major effect of livestock on the Sierra came from transhumant movements. As many as six million sheep a year are documented in Inyo County tax rolls as traveling a circle route, starting near Bakersfield and moving east to the Mojave, up the east side of the Sierra, and crossing at passes—Tioga, Sonora, Ebbetts, and others. The passage of so many animals altered vegetation and established trails and use patterns that are a fact of Sierran life. None of the Sierra will ever be “pristine” again; domesticated animals and humans have been everywhere.

That is history enough; the effects, especially on the vegetation of montane meadows, were sizable. Because of the short growing season, montane environments, like deserts, show the effects of use long after the use itself is past, but change in the Sierra was nowhere near as vast as change in the Coast Ranges of California, where the vegetation mix in effect underwent nearly a perfect swap of Mediterranean grazing-adapted species for the California native plants. The upper elevations of the Sierra certainly were affected by this seasonal grazing and were geomorphologically altered, but the conversion was in no way comparable to what happened farther west. Once the major transhumant movements of livestock ceased with the creation of forest reserves in the 1890s (John Muir actually called, in a massive letter-writing campaign, for the army to be mustered to stop grazing in the Sierra), the vegetative outrage was switched from cattle and sheep to the pack animals of the Sierra Club sojourners—as many as two hundred animals, on some of the trips, resting in the same meadows that Muir had fought to see kept sheep-free.¹¹

The creation of forest reserves was an important set-aside of land in some parts of the Sierra, but in others grazing continued essentially unabated into the mid-twentieth century.

The establishment of national forests proved far more important in the Sierra than the Taylor Grazing Act of 1934. In effect it was a final coffin nail, but the transhumant livestock grazers had been nearly stopped by the turn of the century. Yet grazing continued in many places. Grazing was permitted in the forest reserves, often under the watchful eyes of resident rangers, government employees who were also community members—a striking difference from post–World War II practice in the U.S. Forest Service (USFS). The checkerboard ownership pattern of the Central Pacific Railroad, which crossed the Sierra in 1868, permitted some sheep owners to continue to move their flocks across the Sierra into the 1930s and even the 1940s. That the antisheep campaign was in part racially motivated (many of the herders were Basque, Hispanic, Italian, or Irish) is hardly ever denied; John Muir was not above playing the “race card” to protect his beloved “range of light.” Grazing continued in private land areas, and where grazing domesticated animals was not allowed, rangeland remained habitat.

And rangeland continued to be used in the Sierra for grazing. Its uses as wildlife habitat were self-evident; the forest reserves served rather well for those needs, although many of the areas put under USFS control were relatively high in elevation and austere and unwelcoming for up to nine months of the year. And the foothills, especially along the western slope, were and are still crucial range habitat. Private land, generally coming out of either the old checkerboard or from the cut-over and regenerating lands of private timber companies, is today grazed by ranch owners who practice a particularly precarious kind of transhumant ranching (Huntsinger 1989). Animals are wintered on grain or stubble in the Sacramento or San Joaquin valleys, with some grazing of home ranch properties, from fall through spring, and in May or June go to the mountains to work through the forests. Although these animals all wear bells, the roundup experience through the foothill forests of ponderosa and sugar pines has virtually nothing to do with Heidi.

Grazing of rangeland in the Sierra was most affected by the removal to preserves of vast tracts of the Sierra’s land—except for the western foothills and the lower-elevation meadows of the east side, where cattle, and a few bands of sheep, were still allowed to graze. Two contemporary exceptions come to mind: Sequoia and Kings Canyon National Parks have seen a continuing imbroglio over livestock grazing into and near the park boundaries that perpetuates the long-standing debate among Park Service intelligentsia over whether United States national parks can or ought to include cultural uses. The answer for now, based upon not just the southern Sierra example but also the Great Basin National Park experience, would appear to be “no,” in marked contrast to the international experience where human presence and activity are assumed. The long-term effects of this exclusion upon habitat is another matter that has already seen caustic commentary—that of Alston Chase (1986) comes to mind. Biologically, it is not possible to “shut the barn door.”

Another case involves pack stock. The use of pack animals is a contentious topic that the USFS and the National Park Service are facing with distinct unease, because pack outfits are some of the oldest commercial clients in the Sierra. Government agencies work with rangeland as much by executive order and agency policy as by statute, although federal legislation has produced some crucial changes of direction—consider the National Environmental Policy Act (NEPA) and the Federal Land Management Policy Act (FLMPA), or, for that matter, the Taylor Grazing Act. It is the pleasure of the USFS, built upon the model of Bernard Frenow’s German Forestry Service, to work through regulation. Increasingly, such regulation must have public input and commentary, but in the high Sierra the contending parties are relatively few. Nonetheless, the battle of titanium-frame, polarfill-bag-toting backpacker versus the mule-packed dude versus government range conservationist is an interesting test of the Forest Service’s ability to cope with changing models of resource use. Otherwise, much rangeland in the Sierra is either private, and difficult to regulate, given the contemporary regulatory climate, or given over to wildlife.

There is one further observation that has significance for rangeland in the Sierra. A considerable acreage, arguably a half or more, of the western slope of the Sierra is rangeland. Especially where this is private land, it is also under tremendous pressure for parceling into ranchettes and other subdivisions. By some estimates, as much as 5% or 6% of this rangeland per decade is being turned into housing tracts, despite the remnant encouragement of proagriculture laws like the Williamson Act, which provides tax protections to landowners who keep their land in various forms of farming. Pressure is building from the 300 m (1,000 ft) contour of the Sierra up to about 1,000 m (3,000 ft) to convert land into housing for incoming residents. This pressure will not stop until, to echo Dan Luten’s timeless phrase, the Sierra foothills are as repulsive as every place else in the state (Luten 1986). If not especially cheerful, that view has weight and cogency. The same thing is happening on the east side of the Sierra, from Verdi and Susanville, to Jacks Valley and Genoa, to June Lake and Olancho. Rangeland is becoming housing whenever the price is right. Establishment policy is about two decades behind reality, and unless policy changes do encourage livestock ranching, the cattle, sheep, goats, horses, and llamas will disappear, and in their wake will come rural idyllists and commuters to Fresno, Sacramento, Chico, or the capitol complex in Carson City. In more than a few places Wranglers are being replaced by Internet access for rancher wannabes; that is not innately a bad thing, but whether this change is “best for the resource” is another question. The substantive effect of this change from extractive use to neosubsistence has been little examined.

The issues relating grazing and the Sierra are gnarled and complex. Domestic animals are often nativized; so too are the exotic plants they often bring with them. Vegetation change, landscape modification at a local and rangewide scale, and

hydrologic alteration of the Sierra have occurred, and occur almost anywhere animals graze in numbers. Feral animals have escaped—including domesticated cats, dogs, donkeys, and horses—and pose a sizable threat to native wildlife and to the ecosystems of the Sierra; they are treated differently from sheep, cattle, and pack stock, however. Transhumance, a historically significant activity, is still important across some acreages of the Sierra. Nonuse of public lands is a “solution” that some public-land advocates have taken to emphasizing, especially partisans of a particularly abstract formulation of pristine biodiversity. Yet battles over grazing have been a 150-year fact in the Sierra and will most likely continue with little easing. In fact, although there is some dispute about this, where livestock ranchers abandon grazing, they are likely to sell land into subdivisions, which raises a whole set of ancillary problems relating to land use and protection and to the ability of local and regional planners to cope with changes in use. Furthermore (these issues are indeed all connected), there is an ongoing stalemate between “wise-use” advocates, who suggest that public lands are to be used, and antigrazing forces, who argue that federal lands in particular are part of a national trust.

Wildlife

The initial fact about wildlife in the Sierra Nevada ecosystem is a big one, perhaps too easily ignored because it also affects wildlife across California and the United States. The first and most sizable shift that took place between the ports of southern England and Plymouth Rock in the early 1500s was a deep conviction not that religion should be free in America—it wouldn't be—but that in the colonies game and wildlife were a public property, not a private hoard.¹² Government in the United States is therefore bound to protect wildlife, which until the formation of the European Economic Community was not the case in Europe or, for that matter, almost anywhere else in the world. Determining exactly how migratory and territorial animals (and plants) are to be managed, especially where economic uses are essential for private land and frequently sought on public land, is not easy. This policy migraine has deep roots and reaches to a core of geographical and policy quandaries.

Federal and state governments are saddled with an interesting chore that has few upsides. Legally, wildlife is a statutory, government responsibility, and historically this has posed two separate bodies of problems: how should wildlife be managed, and, in particular, for whose interest are animals to be safeguarded or removed (animals and plants are rarely given standing on their own, the work of contemporary environmental ethicists notwithstanding)?¹³ Second, what is to happen when the needs of private landowners, who possess about 50% of the area of California and 15% of the Sierra, are in conflict with the best management of wildlife (Ewing et al. 1988)? Opinions have changed drastically through time; Beesley (1996) has charted the eras of predator control and

animals in parks being treated like zoo residents. The fashions have shifted markedly.

Given the rather remarkable, if perhaps frail, state of the ESA, the most useful comment here probably is to note that habitat is a complex realm. Conservation biologists are still defining habitat requirements species by species and refining the nature of wildlife corridors; the basic needs of different species are less than agreed upon, and there can be little doubt that there are changes ahead, especially as the existence value of wildlife is discussed and as management priorities shift from game species to endangered species to, perhaps, all species.

Oddly enough, considering that wildlife in the Sierra preceded the arrival of Euro-Americans, many of the most important shifts in policy regarding wildlife are relatively contemporary—certainly since 1960. The influence of the Wilderness Act of 1964; NEPA of 1969, which began requiring the preparation of formal environmental impact statements; the Endangered Species Act of 1973 (and its subsequent controversies); the tenure of James Watt as Secretary of the Interior; and even the passage in 1994 of the California Desert Conservation Act are each in their own ways major federal stepping-stones toward wildlife recognition and protection. Before 1960, a generally laissez-faire attitude prevailed, and the effects of relative government indifference, or at least inattention, were certainly felt in the market hunting of the gold rush era when almost anything edible in the Sierra was hunted to provide meat for the miners. The same tendency to eat any and all meat affected livestock, of course, but though the population of domesticated animals could be, and was, replenished by the long-drive movement of animals from Mexico or the Southwest and Texas, there was no comparable restocking of wildlife. There is a notable dearth of information about the direct effects of market hunting or, for that matter, about predator control later on; the best work is in theses or is anecdotal.¹⁴

Wildlife policy has evolved through time from exploitation for eating to the extirpation of predators, into a contemporary era in which wildlife across the board is held to have value. Whether this “value” will extend to a reintroduction of major predators is an interesting question; the first moves of this waltz are being essayed in Montana and Idaho to less-than-happy reviews from various parties, and it may be some time before, as archenvironmentalist David Brower has suggested, grizzly bears are reintroduced to the Sierra to add a real element of “wilderness” to the backcountry. Because the encouragement of wildlife finds particularly vocal support in urban areas, and California and Nevada are becoming evermore urbanized, it is true that “urban refugees” and city people are strongly partisan wildlife advocates. The existence of a constituency does not necessarily equal policy change, and the apparently intractable and extreme opposition will not break between resource users, who see wildlife and especially the ESA as an impediment, and wildlife supporters (including wildlife biologists, who tend to support the objects

of their study with considerable vigor). The middle ground or compromise position is not accessible (Starrs 1994).

The linkages between Sierra wildlife populations, habitat preservation, resource use, and the desires of a relatively distant city population are strong, but the exact effects have yet to be determined. Federal and state wildlife officials face a bewildering variety of mandates that make any single policy direction difficult. This is typical of the 150-year history of official wildlife-government relations in the Sierra; the vernacular responses—hunting, trapping, habitat conversion, and use—speak more loudly.

Because habitat and resources of the Sierra often affect species at some remove, the domino effect in land use and policy is a fact: an easily understood case is the relationship between Sierra-derived water supplies and fisheries on both the east and west side—the cui-ui of Pyramid Lake, salmon and steelhead of the Sacramento–San Joaquin River systems, and the in-stream fish of the feeder streams to Mono Lake offer three notable, if notorious, cases. Vast levels of environmental engineering (like the Peripheral Canal) have been contemplated to attempt to correct a history of environmental modification like the damming of every one of the Sierra's major rivers—and the effects of California's human population rising to thirty-three million people. A similar story can be told for flyways (in both the Sierra and the once-marshy regions of the Sacramento valley), or for migratory game paths in the Sierra—animals, too, practice transhumance, and subdivisions intervene.

Because wildlife possessed in California what Native Americans did not dominate, and shared the rest, wildlife has been most influenced by human activity and change. And yet, if the policy climate for wildlife has warmed, it remains anything but friendly and tractable. The ESA attempted to put the needs of wildlife, especially endangered wildlife, first, and that act is now beleaguered.¹⁵ When there is a concerted effort to solve problems relating to "natural" environments that have conurbations in close proximity, the results are both complex and often indifferent; Lake Tahoe's "protection," although an interesting example of intergovernmental and popular concern working in concert, is less than a complete success (Strong 1984).

Wildlife is notable in that almost all policy directions have favored one elite group or another—hunters or ranchers come to mind. Of late, a single-minded emphasis in the ESA on habitat protection is assumed, in turn, to offer a blanket protection to all local species. But that response is so out of scale that reauthorization of the act as it is now will be nearly impossible. Disproportionate policy rarely succeeds.

Fire

Whether fire is a resource or just a fact of Sierra Nevada life, it is certainly a potent motive force. Native American burning was widespread, and as active manipulators of the environment, Native Americans are receiving added recognition

(Pyne 1981, 1995). Since Indian times, policy relating to fire could hardly be less intelligent; consistently, policy on fire control has either accommodated government agencies with expansive agendas or sought to placate home owners contemplating movement into fire-threatened areas. Announcements as recently as a Saturday, 8 July 1995, New York Times headline to the effect that federal land managers are now considering including fire as a management tool for public-land administration come with so many caveats as to be risible. There is a certain caesura in the fire policy of the 1990s, an artful pause to allow assessment of potential costs and liabilities to catch up with the clearly stated opinions of conservation biologists and public-land managers that fire ought to be a useful tool for the sustenance and recuperation of public and private land.

The shifts in federal and state fire policy are on the record; certainly SNEP has devoted considerable effort toward gleaning a coherent fire history of the Sierra. The evolution of government fire-tolerance policies has the distinction of equaling perhaps only Bureau of Indian Affairs (BIA) changes in Native American policy for the most consecutive miscues and an equivalent contemporary state of impasse. In fact, the word "disaster" comes to mind, as several conflagrations throughout the Sierra suggest. There is no blame to be apportioned, but the evolution from let burn to moderate control to full control of any wildland fire has inevitably led to a contemporary questioning of whether zero-tolerance of fire in the Sierra has left the range ready for immolation.

The California Department of Forestry and Fire Protection (CDF) and the various fire-fighting agencies of the federal government (there are several, coordinated since the 1980s through Boise and the Interagency Fire Center) have either chosen or seen pressed upon them the role of protecting residents in the Sierra from wildland fires, on private and public land alike. Although various catastrophic California and Nevada fires have suggested that this arrangement is precarious, and the abilities of state and federal resources to protect human-inhabited wildlands is less than complete, it does bear noting that fires in Sierran settings have come nowhere near, yet, to the dollar costs and ecological damages wrought by the Oakland or Santa Monica fires of the last few years. The acreages of vegetation consumed, and the potential loss of firefighter lives, are, however, potentially huge in the Sierra, and the situation is not getting better.

Because assurances of continued fire protection exist, subdivisions and exurban movement continue to blanket the Sierra foothills—a tinderbox by nature, and especially so now that there is a sixty-year history of fire suppression. In fact, a policy of fire control has allowed growth, development, and populations to move into fire-hazard areas with some confidence that they will be protected. That can be a false faith, and the litany of CDF warnings that this particular year (fill in the blank) is potentially catastrophic because either (1) there was little precipitation so vegetation is tinder dry, or (2) it was wet and grass has grown tall, is now received as part of

the yearly early summer ritual (like cleaning out the barbecue), with radio announcements and widely disseminated press releases. Because it covers the spectrum of California's Mediterranean-type climate and its fire-adapted vegetation, the warning is usually correct.

Movement of people into the Sierra foothills, often into areas of extraordinary fire hazard, is another example of vernacular activity taking place in a void left by an unwillingness, or inability, of California (and Nevada, in places like Verdi or Incline) to preclude sometimes dangerous activity. The failure to intercede is both understandable—private property rights are foremost in the United States—and in prospect deadly. There is, in essence, no one and no entity disposed to tell people that they cannot move into the Sierra foothills. Although CDF and the USFS have recently expressed reservations about claiming a fire-fighting mandate, generally in meetings rather than in explicit deliberative policy statements, they are also prisoners of an organizational style that in both cases has some paramilitary aspects—their charge is to get the job done, not to ask why (Weatherford 1981).

The current state of fire policy in the Sierra is profoundly influenced by the studies of wildfire researchers, ethnographers, cultural geographers, and resource managers; in the last three decades, knowledge has perhaps grown more in the field of fire history and ecology than in any other realm of resource management. Part of the reason for this remarkable growth is the paucity of information that existed before—the work of Harold Biswell was path-breaking and even revolutionary in its California setting (Biswell 1989).¹⁶ And the most important point that Biswell and his students have established is simple: much of the Sierra is in natural terms a fire-evolved landscape. To expect that fire will be kept apart from so reasonable a home as the Sierra foothills is a vain hope—the big fires will come.

How policy will evolve to encompass this knowledge is an interesting question—the vernacular changes that have been made in the Sierra are dire, and almost the exact opposite of what scientific evidence suggests is desirable. With Humpty Dumpty scattered in pieces through the Sierra, it is not easy to see how accountability, self-reliance, and an awareness of fire and its hazards can be transferred from government to residents. The expectation is still that humans not only will survive, they will prevail.

Minerals

Mining in the Sierra has been a source of enormous policy change. At core, the facts of minerals and mining are geomorphology and economic geology—the study of landforms and the locations of mineral deposits. It is locating and exploiting those resources, or choosing not to, that is an ongoing problem. The innovations driven by community and miner needs in the nineteenth century have already been noted, but there are landscape changes associated with mining that deserve at least cursory mention; the substance of law is covered in

Beesley 1996. The search for gold, begun in Spanish days in the Los Angeles Basin (where gold was found), grew to obsession after 1848 and produced a pulse of migration to California that populated significant parts of the state. In fact, several of the Sierra foothill counties did not equal their 1850 and 1860 population counts until the censuses of 1980 and 1990. The ebb and flow of boom and bust is fact. And yet, the search for mineral wealth in the Sierra is a chronicle of massive and sequential changes in policy, which have reached and influenced national parks—the Mineral King Wilderness of the southern Sierra was, after all, widely held to be a potential trove of precious minerals.

Mineral exploitation and exploration in the Sierra have produced changes in community formation, property, water ownership and access, subsurface ownership rights, and the law relating to the impoundment of water, and an unceasing series of changes and innovations in the control of energy, transportation, and the technology of mining and its effects. A number of these issues are dealt with in standard histories by Kelley (1959, 1989), Paul (1963), Farquhar (1965), Rintoul (1976), Cleland (1964), and McWilliams (1949). Along with water, mining has been better treated in policy and its progressions than any other aspect of the Sierra. As a result, only a few observations really need reiteration, and these are where the connections between the commonplace and the more orthodox forces of policy making need clarification.

Mineral exploitation created numerous settlements throughout the Sierra but especially along the eastern and western margins of the range. It brought roads to the communities, including railroads in some places, and even saw water transit and riverboats reach into small Sierra tributaries. Like a shotgun blast, the gold rush in California put pellets of towns from Oroville to Yosemite and into the watershed of the Kern River. For thirty years, it was the demands of the mines that fueled the state's economy; almost everything was focused on mineral development or on meeting the secondary and tertiary needs of the merchants and mechanics, the inventors or institutional bankers who had their jobs because of mining. That is understandable enough, even though a thirty-year boom is not easily counted upon.

But the mines also produced landscape changes on an epic and problematic scale. The mine entrepôts—Sacramento, Stockton, San Francisco—were dependent upon the booms and collectively feared their slowing. The creation of financial markets, indeed, the funding of a world empire based upon investment of California mineral capital (including the financing of the Comstock Lode development in Nevada), grew from the Golden State and the Sierra. It was literally a worldwide financial market, its reach documented in journals like the *Mining and Scientific Press*, published from San Francisco (and Oakland, after 1906). These linkages to the world economy made the Sierra of more than casual worldwide importance.

The technology that developed from the Sierra's mines—placer mining on increasingly large scales, culminating in

hydraulic and dredge mining and hard-rock exploration in the Southern mines—was also widely diffused and born of a boosterish climate.

Water developments associated with California mining not only shaped the water law of the West, but, linked to technology and capital, law and practice in California water were moved elsewhere. The reach of San Francisco (and later the East Bay) to the Sierra, like the stunning technological innovations of Los Angeles in the Owens Valley aqueduct, was directly tied to technical advances from the mines, including sophisticated siphon systems, turbine manufacturing, and pipeline technology. It was mineral exploitation in the Sierra that made the contemporary Bay Area and Los Angeles plausible—innovation driven from the bottom up.

And it can be said, though not without some hesitation, that the modern environmental movement owes no small debt to mining. The effluents, and in particular the sediment flows, moving downstream from the Feather, Yuba, Bear, and American River drainages as a direct result of hydraulic mining began clogging the waterways of the Sacramento valley once the river profile decreased in steepness and sediment could settle. This sediment, of course, clogged the waterways and led to the by now familiar “dike wars” of the Sacramento River system, with community after community raising its levees in hopes of excluding rising river waters that were flooding towns with increasing frequency (Kelley 1989). Towns resisted continued mine development, but their petitions were turned down repeatedly, until finally the 1884 Sawyer ruling (North Bloomfield) in federal court closed the door on hydraulic mining—so long as miners insisted upon dumping debris directly into streams. A comparable decision was rendered in California court in the Gold Run decision that same year. This one-two judicial questioning of established practice hardly signaled the cessation of hydraulic mining, but it did cap off the most extreme abuse and compelled the increasingly corporate hydraulic mining ventures to impound their waste and sediment.

This principle of accountability in mining marked a major change in western life and certainly affected the Sierra in its varied forms. No longer was environmental exploitation severed from any lasting consequences—blame and redress could be fixed. Although gold and silver were pumped into the California economy, this newly imposed responsibility was perhaps as significant in western life in general. It established a new baseline for resource development. Other changes in water law, power provision and dam ownership, the protection of urban water supplies through flumes and pipelines—even the establishment of several hundred still-extant communities throughout the Sierra—are related to mining as well. Mining was a boon to California life, if also one that literally reconfigured many of the rivers, canyons, Tertiary gravel deposits, hillsides, and not incidentally the townscapes and wallets of California.

Forests

Forests in the beneficent climate of California and Nevada still grow slowly—far more slowly, in fact, than the forests of the Southeast. The lag between forest cuts is chronologically significant. While experts praise the regrowth of the southern United States’ forests, California and the Pacific Northwest are not long into their cycle of regrowth and are suffering accordingly. Policy in the California forests has been two-pronged, one prong following the course of federal control of much of the Sierra, the other tracing the changes brought by private ownership. In general, policy relating to forest use and exploitation in the Sierra is more tightly controlled than that for virtually any other activity—the apparatus of timber-harvest plans, accountability for poor harvest practices, and the requirements for replanting and, increasingly, making certain that replanted trees actually thrive are the results of a long history of forest development, even if enforcement has varied in effectiveness.

Forests were cut over hard during the nineteenth century, and regulations followed. The CDF and the USFS have split jurisdictions, CDF in charge of administering the use of private lands, including the increasingly important nonindustrial private forest lands (smaller private sales), and the USFS handling the harvest and jurisdiction over federal lands, outside of parks. In essence, much of the evolution of forest management has turned around the question of what sorts of forests are expected or planted after trees are removed—major reservations about the harvest of timber itself is a relatively recent phenomenon, although groves like the Big Trees were set aside early on for posterity (Huntsinger and McCaffrey 1995).

In the main, policy has allowed cutting of forests in the style of the day. Those styles have changed, and in the 1990s, the clear-cut, with its maximum in efficiency but low diversity in replacement species, may be permanently on the way out, in part for aesthetic reasons, but also because of increasing concerns about biodiversity and the effects of both clear-cutting and replanting of monospecific replacement trees. Other changes, including prohibition of herbicide use to knock back brush invasion and to encourage regeneration of the planted “desirable” species, may or may not last; already the herbicide rulings have been slackened.

Certainly forests are more than commercial products, and that realization creates policy implications too. Forests as a locale for wildlife and biodiversity, their importance for aesthetics and recreation, are all important alternative uses, not always in keeping with an industrial forest and policies designed to encourage maximum sustainable forest timber yield. The teeter-totter swing of federal forest harvest sales has not helped the Sierra’s forests, and an ever-increasing activism of Sierra residents is placing increased emphasis on sustainable resource management instead of the more typical “cut and run” policy. But coming up with a formula for “sustainable

resource management," especially given a seventy-year growing cycle and an undistinguished record of past regeneration and replanting, is easier in theory than in practice. No doubt local communities prefer steady jobs—whether the government and private forestry firms can make that happen remains to be seen.

Added to the mix should be "Hardin's Law," named after the distinguished population ecologist Garrett Hardin, which argues that no natural system can at the same time maximize both efficiency and diversity. In the generally reciprocal relationship, a trade-off always occurs; a system becomes efficient at the cost of diversity, and a stable and diverse system is not, in short-term production, particularly efficient. Many of the debates about forest health of the last thirty years have turned over this general statement, which echoes Eugene Odum's 1960s arguments about stability and diversity, arguments at the foundation of modern ecological theory that are now in some quarters being questioned by alternatives like state-transition models. Yet regardless of the scientific debate, the monocultural stand, especially as it regrows into a clear-cut site, is simply not perceived by much of the American public as a good thing. Although the forest-products industry has good reason to dispute this perception, efforts in landscape architecture theory and timber-harvest practice are strongly directed toward camouflaging, with landscape corridors and cosmetic cuts, what is pervasively seen as ugly. The effect of this perceptual resistance to what has for years been standard forest practice, like the on-again, off-again ban on the use of herbicides on federal land clear-cut sites, is cloying to forest experts, but proof that the public sometimes does care, even if "wrongly," about certain issues.

Water (the Hydrosphere)

Although Larson (1996) covers the policy implications and history of Sierra water, two essential facts deserve reiteration: California, including large parts of the Sierra, is fundamentally a semiarid realm through much of the year, and consequently the seasonality of available water is important, and, second, no state has been more highly engineered to redress this simple fact of distribution.

The water history of the Sierra has already been the subject of dozens of top-flight studies in historical geography and environmental history. Probably no aspect of life in California and Nevada has been covered as well as hydraulic history: at least thirty-six book-length studies come to mind when considering the natural and human facts of California and Nevada's waterscape. Because water is the limiting commodity in what geomorphologists refer to as a "transport-limited landscape," it is no wonder that the Sierra Nevada, on both east and west sides, is water-obsessed. Especially in matters of agriculture and urbanization, water questions are immensely complex; land and agriculture are, after all, a founding concern of the United States, dating to Jeffersonian agrarian confidence in the yeoman farmer (and distaste for urban

places). And yet, agriculture (and, increasingly, city growth) in California and Nevada is limited by water supply, so the manipulation of that water has become fundamental to the practice of agriculture. And a multiplicity of other forces contend for secure access to water.

Arable Land

Farming is important in the Sierra, and where open and appropriate land is not cultivated, it makes for splendid wildlife habitat and hay lands. But with the difficult terrain, a relative absence of open valley floors, and the very elevation of the Sierra, there is not a lot of cropland agriculture in the Sierra, certainly nothing comparable to that of South America on similar slopes. The vagaries of climate require irrigation throughout the Sierra, and in some of the areas where tree crops proliferate farmers make a steady income from orchards and nut crops.

The importance of marijuana growing in the Sierra is undetermined. The marijuana harvest is probably sizable, but no one wants to know for sure. Shifts in state and federal enforcement policy (especially relating to land seizures) have moved such cultivation off private land and into the national forests.

There is a great deal of comparable casual agriculture, in some cases by residents of long duration, in other cases by relative newcomers who savor the opportunity to farm on a five-acre parcel. Although attractive in prospect, farming small tracts is probably among the most destructive possible uses of land and a direct result of the decreasing profitability of larger-scale ranching in the foothills of the eastern and western Sierra.

Movement

Getting across the Sierra has long been a strategic necessity. Such mobility has not come cheaply. Whether the responsibility for locating routes fell to trappers, western "mountaineers," or railroad company scouts, or whether the trails followed the Native American routes across the Sierra, as had been the case in the Appalachian ranges a hundred years before, a mountain range with passes nearly 2,500 m (1.5 mi) in elevation, except at the northern and southern ends of the batholith, posed a travel hazard.

And yet, goods and people had to be moved. Initial efforts to cross the Sierra were avowedly commercial; John Sutter and other early-nineteenth-century Sacramento and San Joaquin valley landowners wanted overland visitors to whom they could sell land. They had to cross the Sierra to get to California. This movement produced industries, in the mid-nineteenth century, on both sides of the Sierra—communities on the east side for staging, to provide guides, to offer changes of stock, and to supply the travelers, and a burgeoning community on the more gently sloping west side to shepherd the arrivals to an appropriate resting place; the arrival then would

have had a passing resemblance to stepping out of baggage claim in a foreign airport near the equator.

Some of the best-known trips were the unsuccessful ones; geographical information about the Sierra was not reliable, and observed data about crossing Utah and Nevada in the 1840s was still worse. Corrupt guidebooks misdirected overland travelers, some of whom perished either on the way to the Sierra, or in it. The Donner Party holds a special place in the American imagination, perhaps because it is difficult, standing near the Interstate, to imagine so much snow on the ground at Donner Lake. Yet the Donner expedition brought a dozen people to eternal repose and has fed the imagination for nearly 150 years, a traveler's (real) nightmare.

Alternative routes across the Sierra were widely sought but not often found. The best passes lay far to the north, at Beckwourth Pass, and still farther to the south, at Walker Pass. Although both routes were found relatively early, neither was especially attractive (Howard 1993; Todd 1949; McCarthy 1974; Nash 1985; Stewart 1962; Vale and Vale 1983). Routes across the central Sierra were scouted through the 1850s and 1860s, largely by groups interested in the potential of a railroad route and, of course, the speculative value of land that either came with the railroad (the "checkerboard") or land serviced by the tracks themselves. No all-weather passes were found; even the route at Donner required a vast investment in highly experimental technology, including the rotary plow, roadbeds chiseled into granite, and a vast network of snowsheds to protect the tracks from avalanche. Technological innovation was critical to transit across the Sierra. It was worth the expense; San Francisco, the Sacramento valley (and especially the booming wheat crops of Glenn and Colusa), and the San Joaquin valley beckoned.

Left behind was the entire east side of the Sierra and the pocket valleys, isolated and even today relatively sparsely settled, in the Sierra massif itself. Near Quincy, south by Sequoia at the Kaweah Colony, at John C. Frémont's Mariposa Colony, in the agricultural and irrigation colonies of the San Joaquin valley, was other potential. Once the railroad reached Quincy (late), its future along the Feather River was set; epochs of booms and busts dominated elsewhere. Genoa, on the east side of the Sierra near the foot of the Kingsbury grade to South Lake Tahoe, was the oldest community in Nevada but was deserted in the 1860s when Brigham Young grew restive, fearing an invasion from an increasingly hostile federal government looking over the Utah Territory (already dubbing itself "Deseret"). The Mormon Station at Genoa was abandoned.

The boom in trans-Sierra travel came with the Comstock exploitations. As capital shifted after 1859 from California to Nevada—sometimes literally, sometimes in the nineteenth-century equivalent of electronic banking, by telegraph—the rush was on to depart the western mines and head to the silver strike in Virginia City and, soon, elsewhere. With the railroad not yet completed, the communities between Donner Pass and Tioga Pass—at 3,003 m (9,998 ft), the highest of the

main Sierra passes—grew quickly. Yet the passes had to be kept open, through sometimes difficult weather. Government monies were slow in coming to what were predominantly private ventures.

The Union Pacific–Central Pacific Railroad, finished in 1869, could run through most weather, but its access was modest, and stages and secondary lines, or livery horses, had to carry passengers once they stepped off the Zephyr in Reno, Truckee, or Rocklin. To keep the railroad open was sometimes an epic struggle and was played as such in the local newspapers. Severe storms and their effects on the trains are still recorded in photographs that dot the walls of Sierra towns. Passengers across the Sierra could be delayed for days on the east side; not bad news if they were in Reno, which was cultivating an insalubrious reputation, but decidedly inconvenient.

Railroads and transit were decisive for one industry, the mines. Railroads or the Truckee River itself transported logs and supplies from the Sierra and parts west back to the Nevada mining operations, and provided many of the luxuries that mining barons were used to, including oysters, sourdough from San Francisco, and the San Francisco daily Call, an early entry into that city's subpar dailies. The spillage east from California made Nevada what it was; without that rail traffic and the capital, technology, equipment, and knowledge it brought, there would have been no booms. Yet travel was arduous at best.

Roads across the Sierra were a misery. Through the 1920s, most highways were toll roads, the exception being the sometimes federally financed Lincoln Highway, ultimately completed in 1930 but in 1912 put forward as the first "complete" transcontinental road (Hokanson 1988). It was anything but. These tracks and byways have been treated by several authors—Tom Howard's (1993) dissertation is the best work to date. The routes varied in effectiveness and seasonal reliability; Sonora Pass, for example, had been identified in 1852 as a quick route, but even today its 22-degree pitch near the summit intimidates all but the boldest traveler, and it is shut with the first breath of winter. And yet, these were often the same routes that sheepherders used as a regular part of their circular routes across the Sierra; a sequential pattern of use, with passenger roads as the next alternative, was kicking in.

As the strategic importance of the West Coast grew during World War II, the pivotal role of roads was recognized. The National Defense highway system, first proposed in 1910 but not supported until the 1940s, was slowly moved over into what is now known as the Interstate highway system. Its first purpose, and *raison d'être*, was to move troops and matériel in the event of a West Coast front. Little wonder that the flavor of George R. Stewart's classic *Storm*, with a huge blizzard shutting down old U.S. 40 (now Interstate 80) has the crisp ring of high drama. It was vintage 1930s and '40s.

Casual travel across the Sierra was primarily by train until the 1950s. With the arrival of skiing at the Squaw Valley Winter Olympics in 1960, the Sierra became a destination resort. Even after the Winter Olympics departed, demand to see the

facilities that had been spoken of so widely, and televised for the first time, built steadily. Now, the Sierra sees near-gridlock on many Friday nights and Sunday afternoons through the winter—worse than that for three-day weekends, with skiers from San Francisco to Hollister, from Mendocino to Marysville trying to get an early start and hit the slopes.

The industrial uses that once supported the railroad, and which in theory were supposed to assist the Interstate, are now regarded as bothers. Trucks jackknifing and grinding at slow speed across the battered concrete pavement are a major source of skier distaste, and with good reason. Yet the major change in transit through the Sierra is simply the replacement of private initiative with federal and state largesse—the Highway Trust Fund and state monies maintain a series of Caltrans stations along Interstate 80 that spit out a series of familiar orange trucks once the snow falls or accidents occur. Use of the other roads across the Sierra is more a matter of happenstance—Highway 50 remains open much of the year, but not always, and it is slower than its northern sibling; the roads south of Highway 50 close with the snows.

Among the great controversies every year is commerce associated with opening of the Tioga Pass road. Businesses along the east side of the Sierra are at least somewhat dependent upon traffic across the Sierra, so they eagerly await an early opening of the Tioga Pass road. Because that road goes through a national park, there is resistance to what is sometimes voiced as “accommodation” to the economic imperatives of east-side businesses, however great their hardship. And yet, each year the Tioga Pass road is plowed and the tourists flow, leaving tips and taking snapshots of scenery with them. This commerce is supported by federal monies—often by Yosemite National Park funds—but there is little choice.

Recreation

Precisely what the Sierra is supposed to be from a human perspective, what it has been through the ages, has changed greatly. The ideal of wilderness is oddly American and especially western, and this has been recognized for years. And yet this obsession with “wild” land is also often seen abroad as one of the nobler aspects of life in the United States; it draws tourists in large numbers, and there are few places on earth where so much land is given over to so little directly economically productive activity. Land and wilderness are instead said to have existence value, and for that praised. The vision of wilderness as a dark, spectral space, daunting and dismal, was by and large left to the East.¹⁷

And so recreation has become, especially in the post-World War II years with the development of leisure industries for the middle class, a major business for the Sierra, and that interest in re-creating (the word is significant) is the source of both profit and many policy changes for the Sierra. In essence, many of John Muir’s arguments, praising preservation and existence value over economic and commercial utility, have been reversed—Gifford Pinchot, who would have won those

arguments in the 1890s, would find the situation less helpful today. No longer is utilitarianism foremost; instead, respect for the undying values of relatively raw nature is praised.

There are still exploitative uses of nature like river running, backpacking, fishing, and hunting, but they tend increasingly toward nonconsumptive use. Preservationist ideas have a certain rebound, although the number of backcountry hikers in the Sierra is down, despite a huge surge in the population of California. This, too, is part of the episodic attraction to nature; the hikers who swarmed into the Sierra in the 1970s, “loving the wilderness to death,” have settled down to children, Thermarest pads, car camping, and mortgages, instead of VW minibuses, dried fruit and gorp, and cheap, cotton sleeping bags. Yet advocacy for wilderness and backcountry recreation remains high.

Among the very difficult policy topics in recreation is elitism. In majority nonwhite cities like Los Angeles and Fresno, and even in white enclaves like Chico, complaints are increasingly being tendered that government agencies like the Forest Service and the Bureau of Land Management (BLM) are not attuned to the needs or desires of minority populations. The accusation is made, whether true or not, that many of the recreational apparatchiks at a national level are, in essence, in the business of protecting a very large amount of land as the stomping ground, a kind of extended backyard, for an educated, white elite that is not interested in making that terrain available to a more diverse citizenry. Whether these agencies are elitist or not, there can be no doubt that a major policy front will involve opening up the forests, parks, and other public lands and lakes to a nonwhite population that has historically been very much in the minority of California users of such resources, largely because their needs have rarely been considered, studied, or sought out.

Parks and the uses of parks change widely through time. Galen Cranz has written about this, in particular from an urban standpoint, but her arguments are extensible to the national forests and other public lands of the Sierra Nevada ecosystems.¹⁸ Finding what is desired, what is attractive, and what is needed will require more assiduity than has been displayed to date. The accusation of elitism is loathsome to many who grew up backpacking in the Sierra, in part because it has the ring of truth and is a trigger to volumes of white self-reproach.

The national parks are, of course, the crown jewels of the Sierra, and they have been treated in a large number of essays, enough that little reiteration is needed here. Whether the parks were chiseled from the best of the country’s surface or, as Alfred Runte has argued, they were unusable lands that were placed in parks as a sop to those who wanted preservation but had no political clout to protect resource-rich land, is for the experts to debate (Orsi et al. 1993; Runte 1987). But like the urban parks, the national parks have gone through their sequence of different eras: as a lonely refuge for the very few; as a kind of botanical and scenic zoo; as a literal zoo, with regular public feedings of caged bears; as theme parks,

with nightly firefalls as in Yosemite; and as safe havens for the distant-from-home, with fire and predators like mountain lions and coyotes removed. Natural features are always modified by human activity and have been in California and Nevada ever since the arrival of Native Americans. Nature is a socially constructed fact, not a biological absolute. Instead, the natural world of Yosemite, Lassen, Sequoia, Kings Canyon, Mono Lake, and other sites has been transformed into a palatable version for the visitors, many unfamiliar, now, with a “wild” nature, who are the parks’ constituency. And one of the last things that anyone wanted to acknowledge through much of the history of creating American parks is that, in the wild, nature kills (Leopold 1991b).

Yet kill it does. Battles over access to parks produced safety improvements and proved the utility of parks for other purposes—like providing, in Hetch-Hetchy, a prime reservoir site for San Francisco. Roads were run in—not early, surprisingly. Yosemite passed nearly sixty years as a park without a road to the valley floor; there was no road until the Raker Act was passed in 1913, the same act that permitted San Francisco its Tuolumne water supply. Yet now there are predator-control programs, relocating “problem” bears, carefully improved trails (often trails first built by Civilian Conservation Corps or Works Progress Administration crews of the 1930s and 1940s), and even gun-toting Park Police. Parks are little different from medium-sized cities through significant parts of the year. The preservation of natural values and recreation is a matter of question, or at least, taste. Liability in the national parks is an increasing problem for the Park Service; it is difficult to overestimate the amount of trouble that city visitors can get into in a park setting.

On the other hand, there is no shortage of places where hikers and travelers can get seriously close to nature. Boating down any of the upper- and middle-range Sierra rivers, primarily on the west side, but sometimes even on the east side (the Walker, Carson, or Truckee), can be dangerous. Some choose that. Others want to drive a car through a Big Tree or pivot the satellite dish on their mobile home from the valley floor. This is the United States; forming policy to accommodate all these views is no easy matter, in particular because some of the visions (seeing pristine nature without any indication of humans and accommodating Winnebagoes, for example) are flatly contradictory and mutually exclusive.

Property (Habitat)

Land can be said to be the ultimate American sacrament, as Paul Gates taught two generations of land-tenure researchers (Gates 1960). It was the availability of land that drew settlers to North America during the seventeenth century, and it is still land and opportunities for getting land (although it is no longer “free”) that draw immigrants from around the world in the late twentieth century. Acquisitiveness and opportunity for gaining land were driving forces for two hundred years of United States history, until the selling of the

public domain finally ended with FLPMA in 1976, with the rescission to the BLM of land previously available to homesteading. What began in the mid-1970s was a new era, or at least a different one, in theory emphasizing government land stewardship instead of land alienation, or sale. This shift has been a boon to scientists and environmentalists, who praise the preservation of public lands (about 85% of the Sierra) as potential, if not actual, wildlife habitat and a laboratory for biological diversity. This new era is not so praised by potential resource users (who often do not own the land they exploit), or by potential settlers, who see the end of the free (or cheap) land epoch. This policy juncture is crucial, maybe the most important in the geography of the Sierra. And yet it is also a simple fact: homesteading in the Sierra is no longer possible, at least not under a government aegis, and therefore the value of land is appreciating under the exigencies of supply and demand. Land is increasingly being commodified because it is scarcer all the time—scarcer because the supply is cut off and because there are ever more people in California and Nevada who want access to the Sierra for varied purposes.

The Sierra has seen an essential contrast between different views of land and property, and understanding that land is not a fixed or universal commodity is an important facet of policy. As Joe Jorgensen has suggested, land is not the same thing to all people (Jorgensen 1984). Different visions and different attitudes toward land are shaped by cultural facts including occupation, race, ethnicity, religion, history, and language. In Jorgensen’s study, the attitudes of Mormon farmers, Native Americans, ranchers, sodbusters, and environmentalists were dramatically at odds. Although his study was in microcosm, across the larger Sierra a vast panorama of views of land could be expected. These differences have produced conflict in the past and will continue to do so in the future.

Among the more intriguing developments in land policy in the Sierra is a homegrown movement in California pressing for a locally informed understanding of land-use issues. Known as the bioregional movement (or sometimes arguing for “watershed consciousness”), it presses strongly for communities to attend to local needs before becoming involved in larger or more global issues. In essence, the argument is that one’s own house should be in order before the house-keeping of other groups and communities is challenged. With a number of fronts, some in the San Francisco Bay Area, some in the Sierra Nevada foothills, especially around North San Juan Ridge, this bioregional consciousness movement is anything but another “flaky” California trend; it is instead finding vast support around the United States and abroad as an example of socially and community-informed land-use planning, with extensive local involvement.¹⁹ Yet bioregionalism has some elusive and uncertain effects upon public land and public land management, in part because the emphasis of Gary Snyder, Peter Berg, and others is on local control, not absentee ownership. The policy implications have yet to play out entirely; the movement is still building, but many groups

in the Sierra are taking this bioregional ethic to heart and producing strong critiques of the federal government's distance from local issues.

The call for "community-based resource management" is loud in the environs of the Sierra Nevada and has some interesting resemblances, in fact and theory, to the wise-use movement, although with a different politic. In fact, the Sagebrush Rebellion, centered in Nevada, Utah, and other states of the intermountain West, has an expression in the Sierra as well. Although summarizing the current situation is not easy, perhaps it might best be contained within an insistence that the federal government continue to be a steward, with a higher degree of sensitivity instead of pressing agency goals that have little semblance to local needs and ideas.²⁰

Existence Value (Biodiversity)

Whether humans are a part of "nature" may not necessarily sound like a policy question, but in regard to the Sierra Nevada it clearly is. Land can be preserved and conserved in many ways, and whether the human presence is to be a part of that is an important issue (Leopold 1991a). Studies of park formation and biodiversity reserves generally do not include humans as a component, an expression of a Frederick Law Olmstead tradition that still holds in the 1990s. Yet opposing views are heard, and have been in the United States since the 1920s and 1930s.²¹

Just how land is best to be preserved and sustained is always a difficult question. Among the important decisions that have to be made is whether a human presence is considered acceptable in public lands or, especially, on park lands.²² Although the official view of such matters is clear and skeptical, the pattern in other parts of the world, where there are not such extensive tracts of "pristine" land, is much different. There, parks and government lands are often dotted with legally allowed residents; in some cases, national and regional parks actually include a variety of cultural features, sometimes entire communities, tacitly acknowledging that the human presence is "natural" there. Comparable recognition has not been achieved in the Sierra, although the "problem" of inholdings in the national forests is at times difficult and contentious and a powerful lobby supports it.

There is, furthermore, a great deal of public policy strain that develops in the legislative process between the needs and imperatives of California and the West and those of the eastern half of the country, where facts like water shortage, public lands, insecure tenure, spaciousness, a vast wildlife population, and other such fundamentals of western existence are at best poorly understood. This becomes an issue, especially when views of the rights of nature and of natural features on the landscape are pressed, as in Christopher Stone's eloquent views (Stone 1987, 1974; Sax 1987). There are also some similarities between this difficult regional impasse and the public trust arguments first formed by Joseph Sax when he was at the University of Michigan—public trust arguments

are much more influential and far-reaching when they apply to half the land or more in an ecosystem.

Public Trust

The public trust argument, in general a development in law of the 1960s, holds that a number of resources amount to public goods and that it is the responsibility of government, and especially of the federal government, to preserve the quality of those resources for future generations. As Harrison C. Dunning has noted, the legal content of the public trust argument is a relative novelty in the United States, but the principles that underlie public trust date back to classic times, for it was in the public interest during Greek and Roman times to maintain navigability, preserve resource use options, and serve the public good.²³ These ideas apply especially to water, wildlife, habitat, and a variety of positive externalities such as clean air, clean surface water, unpolluted ground water, and other qualities and quantities that have a formal physical expression but that have a value not easily commodified.

Public trust doctrine explicitly puts responsibility for maintenance of several forms of environmental quality on government, and, increasingly, case law suggests that it may come to be the ultimate authority (and responsibility) of both federal and state governments to safeguard resources for posterity. The argument is still forming, however. Exactly what falls into the public trust is not always easily resolved, something that Joseph Sax recognized in 1970 (Sax 1970). But how broadly these arguments for the preservation of future options can be extended is the real policy dilemma in the Sierra. There are extremely difficult and divisive issues that tie into private property rights, and the public trust doctrine quickly runs afoul of some of these land-rights issues if habitat preservation (especially on private land) is upheld as a necessary requirement. The wise-use movement, with its own polemics, takes a Hooverian view of right and wrong ("the business of America IS business").²⁴ Given a 150-year history in the United States of land acts that appeared to place fee-simple ownership of 64 ha (160 acres) and up of land as a sacred right, the line between public trust preservation of wetlands, endangered species, in-stream flow, genetic resources, and other precious goods is not easy to draw. As a case in point, there is the near-total collapse of the fisheries of the Sacramento River, so reduced in vigor that any number of technical fixes, many of questionable effectiveness, keep being proposed (Black 1995).

And yet, there are arguments for the preservation of options that are impossible to gainsay. When Wallace Stegner wrote of wilderness as a part of "the geography of hope," when Starker Leopold insisted that wilderness and national parks should serve as "vignettes of primitive America," there were striking, important themes. Such extents and acreages, such reserves and refuges, may appear to residents of the developing world as an impossible luxury, but it is a luxury that many residents of the United States, at least until the

1990s, have insisted upon (Sax 1980). And they may well have a point.

CONCLUSION

Policy evolution in the Sierra can be traced through any number of different landscape elements. The course of a few are included here. The essential point is that the Sierra's landscapes have gone through a series of important evolutions driven by two forces, one essentially vernacular and improvisational, and the other perpetually reactive and "establishment" oriented. The forces of the establishment are those recognizable, even shopworn, elements that are traditional to history and policy studies but can hardly be taken as inclusive. Many of the most significant changes to the landscapes of the Sierra, maybe almost all of them, are the product of local demand and vernacular activities. Policy is after the fact—vernacular change is avowedly contemporary.

Five broad themes were introduced in this chapter, and they have framed the arguments throughout. Implantation has surfaced in looking at the arrival, colonization, and beginning of community entrenchment, whether in grazing, wildlife and habitat, agriculture, mining, or the use of fire as a management tool. Ideas and practices are as much subject to implantation as the scribing of town boundaries or the development of water law. Exploitation is concerned with the use of land, whether destructive or consumptive; in recreation or water; using the tools of fire or chainsaw or residential "ranchette" or dam. Tenure examines how humans have made their use and possession of the land felt, taking the land as private property, managing it as a commons of individuals or for a village or group, holding the land available to all as the seldom-seen but much discussed "open-access good." Intensity is perhaps the trickiest of these concepts, for the vehemence and rigor of use does vary everywhere across the face of the Sierra, and through time. Some landscapes are hard-hit by vernacular use—some have in effect been sacrificed by private or government practice, by law or by custom. A dam site would be a prime example, with the flooding of a sizable area deemed in the greater public good, with an intense use (being underwater would seem to qualify as that). Finally, linkages look at two different realms—the roads and power lines that bind the Sierra together or that are sundered or blocked, and therefore restrict joining. But fully as important as physical ties are the more ideological connections: economies bound together; ideas about wildlife or subdivisions; access or exclusivity that has diffused from one place to another; the expectations and aspirations that lead San Francisco Bay Area urbanites into rural retreat in the Sierra foothills, seeking some variant of "the good life." These five themes underlie everything in this chapter.

The landscapes of the Sierra show a welter of human

influences. Policy has responded, sometimes appropriately, but only in the rarest of circumstances preemptively. That is an important part of the Sierra's policy story, and it is the study of geographical change, of exploitation, destructive and not, writ large.

NOTES

1. Harrison C. Dunning, of the University of California at Davis School of Law, notes that such broad statements as these require some qualification, that indeed the law is a jealous mistress and there is little that is not addressed, even by omission, in legal practice. For example, as he states, "the policy of recognizing use rights (the usufructuary policy), was in fact embedded in the establishment law as well as the vernacular practice" (H. C. Dunning, letter to the author, October 6, 1995). He is obviously correct; for government not to govern is indeed a form of government.
2. Walters's point is amply borne out by data from driver's license changes that used to be collected by the California State Department of Finance, now held by the Department of Motor Vehicles.
3. The evolution of wildlife policy is traced later in this chapter, but a cogent summary of the different American eras can be found in Dunlap 1988.
4. On the management of both Yosemite and Sequoia-Kings Canyon National Parks, there is the remarkably effective special issue of California History. Of special note are the essays by Dilsaver and Strong (1993) and by Runte (1993).
5. Studies of Native American roles in the Sierra are relatively numerous. Among the relatively recent works that include discussion of Native American management is Vale and Vale 1994.
6. This instructive lapse between land use and policy, especially when the group involved is a racial or ethnic minority, is discussed by Limerick (1987).
7. On the nature of environmental change, there is a great deal of discussion, much of the best from Harold Heady and James Bartolome; for an example, see Heady and colleagues 1991. For an overall picture, although dated in the light of more recent analyses, see Burcham 1970 and 1982. For details of the California social situation during Spanish-Mexican times, see Pitt 1966.
8. On the details of Californio ranching during the peak era, see Rojas 1979. The accuracy of the Rojas view is discussed in Haslam 1986. There are also essays by D. Hornbeck, although his voice tends to be absolutist. The writing of Jo Mora (1948) (also aptly illustrated) is a surprisingly accurate and tasteful, and therefore instructive, treatment.
9. On the overall context of the social and physical elements of land-use change after the introduction of livestock, there is much. Perhaps the best is Bishko 1981. It follows on the classic 1920 study of Klein. The great benefit of Bishko, Klein, and Butzer is that they see clearly the connections between thirteenth-century laws and practices and contemporary problems, although those are articulated with varying degrees of grace. See, as a case in point, Butzer 1992 and Jordan 1993. Commentaries on the New World roots, especially as they affect California, Nevada, and the Southwest, appear in Dusenberry 1950 and 1963.
10. See Douglass 1985. The longer, and more thorough, study is the earlier volume, Douglass and Bilbao 1975. These treatments, along

- with those of Richard Harris Lane, offer a portrait of cultural assimilation and the influence of livestock grazing and the practices of transhumance on the Sierra and its ecosystems; see, for example, Lane 1985.
11. The photograph archives of the Sierra Club in the Bancroft Library show virtual equid waves, waiting to attack the Sierra front from the trailheads; photographs of meadow scenes suggest that the effect of grazing was more interspecific swap than cessation—and horses, burros, and mules are notably harder grazers, and less efficient, than sheep and cattle.
 12. On wildlife and wildlife law, see Lueck 1989, Lund 1980, Smeltzer 1985, and Tober 1981. On the general status of wildlife in the United States, see Dunlap, 1988. It is matched by Mighetto 1990.
 13. Stone (1974) takes one point of view, arguing for a generic equality—a view that Merchant (1992) has posited as part of a generalized ethics of nature, but which Lewis (1992) repudiates as an over-the-top form of “speciesism.” Occupying an intriguing middle road is Bourjaily 1984.
 14. See Stine 1980. The larger picture is prepared, in an acknowledged classic, by Dasmann (1965).
 15. The ESA, its status apparently safeguarded in late June 1995 by the U.S. Supreme Court, is nonetheless the subject of much real searching into the nature of private versus public property and is an endlessly complicated issue. See Cole 1992 for a discussion that materially affects California, or Harrison 1991. For an encyclopedic treatment, see Bonnett and Zimmerman 1991.
 16. The February 1994 Biswell Symposium is an apt follow-through to the ideas of Harold Biswell, nicely summarized in Biswell 1989 and Weise and Martin 1995.
 17. The original treatment, novel then, was Nash 1973, followed by Nash 1989. This view found a spirited commentary from Worster (1990). The contemporary changes in wilderness theory are effectively charted in Oelschlaeger 1991. Amazingly prescient and crafted with both philosophy and wit is the early statement of Aldo Leopold, reprinted in Leopold 1991c. Aldo Leopold’s views are spelled out in Flader 1974.
 18. The periodization of American park making is by no means entirely ordered or rational. There is a great deal of self-aggrandized and carefully projected social engineering involved; see Cranz 1989 for a discussion.
 19. An original statement of bioregional categorization and philosophy is found in Udvardy 1975. Udvardy’s start has been widely discussed; see Dasmann 1976 and 1988. An eloquent discussion of bioregionalism and sense of place appears in Parsons 1985. Arguably one of the most effective workers in bioregional ideology is Gary Snyder; see Snyder 1990.
 20. On the place of government tribal culture, see Weatherford 1981, which discusses Forest Service activities as a form of cult and culture that is devoted to self-preservation; it follows upon the classic study of Herbert Kaufman (1960).
 21. For a reasoned argument, in historical context (the original report was prepared in the 1950s and published twelve years later), see the blue-ribbon panel discussions released by the California Public Outdoor Recreation Plan Committee (1970).
 22. On the dilemmas of how culture can be incorporated into park land, see Sax 1982. Sax’s skepticism is posed in more austere terms in Sax 1993.
 23. See Popper and Popper 1993. The spirit of skepticism is best argued in Luten 1986. For a discussion of the problems of crowding and migration, see Starrs and Wright 1995.
 24. The range of opinions about the so-called wise-use movement is blisteringly diverse. For some ideas of the scope, see Hage 1994, Helvarg 1994, Gottlieb 1989, and, finally, Echeverria and Eby 1995.

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