The Transformation on Public Lands

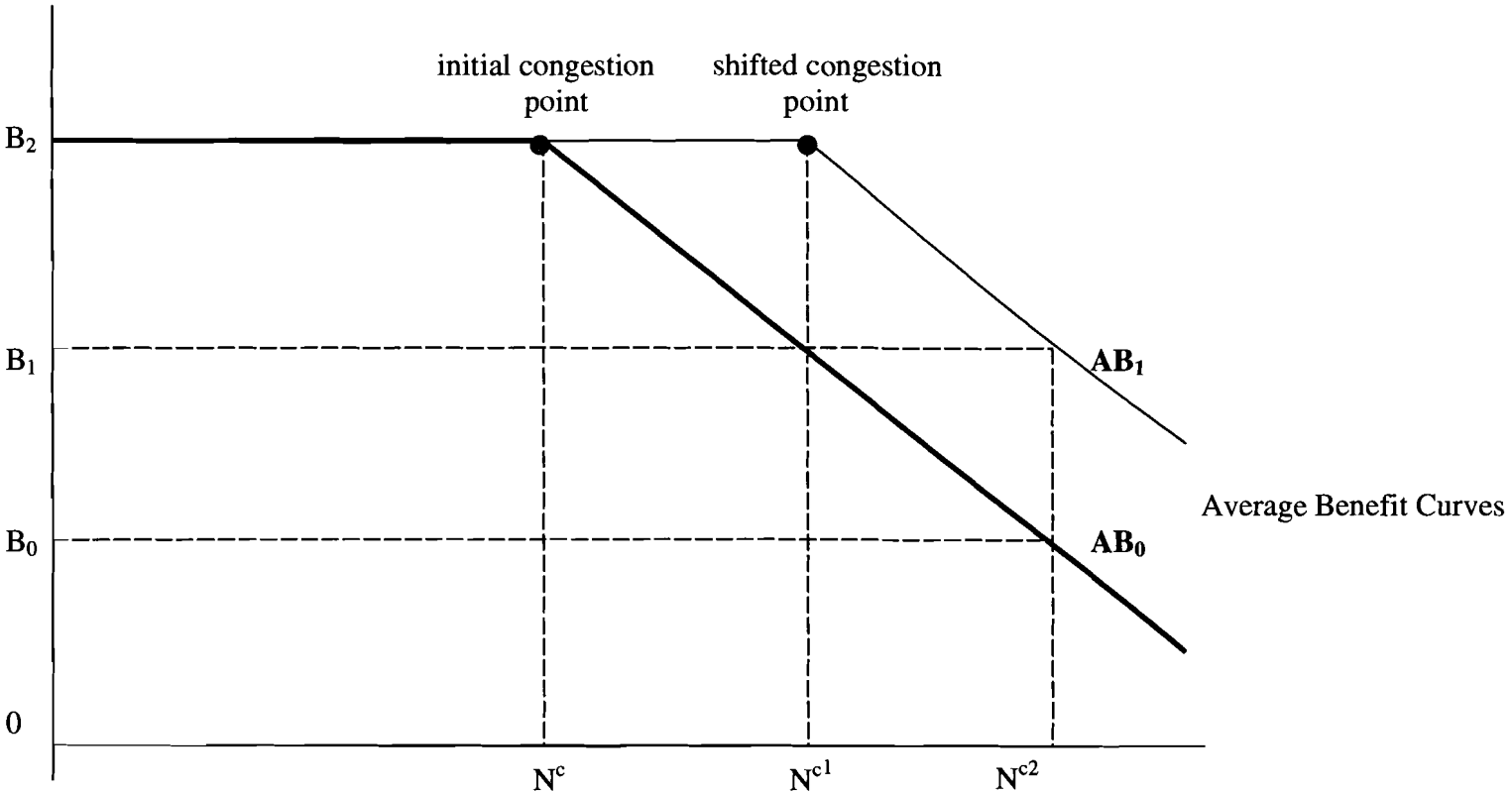
Part 2

by

Jan G. Laitos and Thomas A. Carr

Originally published in ECOLOGY LAW QUARTERLY
26-2 ECOLOGY L.Q. 140 (1999)

Figure 3


initial congestion point
shifted congestion point
B2
B1
B0
0
AB1
AB0
Average Benefit Curves
Nc
Nc1
Nc2

In the case of recreational use of public lands, the downward sloping AB_0 curve in Figure 3 represents what happens when increasing numbers of recreational users flock to a resource with a fixed number of units available to them. One can argue that, despite the seeming increase in the amount of public lands available for recreational use, there has not been an increase in the overall quantity of public lands. In fact, the number of acres of public lands from which recreation lands are created has actually declined over the past 20 years, while recreational use of the same lands has dramatically increased.[265] How can one account for increasing enthusiasm for recreation on public lands when the downward sloping AB_0 curve suggests that more recreational users on a fixed or declining quantity of public lands should be deriving *decreasing* benefits from the resource?

The answer lies in the average benefit curve AB_1, which has shifted outward from the average benefit curve AB_0. This shift occurs when something causes an alteration of the jointness characteristics of the resource, such that the congestion point does not occur when the number of simultaneous users is N^c, but rather at the higher number N^{c1}. If the resource can still provide the same level of benefit (B_2) to a larger number of users, then not only is the congestion point delayed, but also the resulting outward shift in the average benefit curve means that a fixed number of resource users (with $N>N_c$) enjoy greater benefits than when the average benefit curve has not yet shifted. For example, in Figure 3, if the number of simultaneous users is N^{c2}, the average benefit to each user is B_0 when the curve has not shifted (AB_0). But after it has shifted (AB_1), the level of benefits enjoyed by the same number of users has increased to B_1.

What causes such a change in the jointness characteristics of a resource? One factor that can alter jointness is a change in the property rights assignment for users of the resource.[266] Should the property rights assignment be altered so that certain users are provided a property right to the resource, they will be emboldened to use the resource in greater numbers, knowing that their use is legally protected and perhaps even encouraged. Moreover, if there are other uses of the resource that are inconsistent with or nonapplicable to the corresponding property right, then the use benefiting from the property right, or the more protected property right, will be favored as a matter of law.

265. *See supra* Part I.C.

266. *See* Barnes, *supra* note 263, at 592, 594.

There will be decreasing numbers of users who have no property right or a lesser property right. With less overall users, the use with the preferred property right can tolerate larger numbers of similar users consuming a fixed quantity of the resource. As a result of the property right assignment, the jointness characteristics of the resource has been altered, the congestion point has moved outward, and the average benefit curve has shifted to the right (in Figure 3, from AB_0 to AB_1).

The shifted average benefit curve AB_1 seems to describe what has happened with respect to the increasing numbers of recreational users on public lands. Because of countervailing pressure from recreational users, as well as other economic factors noted in Part II.A., there is a corresponding decrease in numbers of the competing use of public lands— commodity users. With fewer commodity users, some of the users who had a disproportionately great impact on congestibility, and who interfered most with jointness, are gone. A greater number of recreational users can therefore simultaneously exist on a fixed quantity of public lands without congestion occurring. The jointness characteristic of the public land resource has been changed, so that either a greater number of recreational users can enjoy it, or the same number of recreational users can derive a greater benefit. In Figure 3, when the curve shifts from AB_0 to AB_1, then for a fixed quantity of recreational users at the N^{c2} level, the average benefit has risen from B_0 to B_1.

What has provided recreational users with a property interest in public lands? Three developments have helped to define and establish the public's property right in recreation on public lands. This property right, in turn, has both accelerated the public's interest in the recreational potential of public lands and altered the jointness of recreational uses at these levels. First, the threat to recreation by commodity industries has been a rallying cry of environmental organizations.[267] They have used their considerable lobbying skills to ensure that Congress supports recreational opportunities on public lands, usually at the expense of commodity interests.[268] Second, Congress has, by statute, made recreation the sole use, or a dominant use, on much public land. Recreation is the only human use permitted within

267. *See, e.g.*, CHASE, *supra* note 193, at 1-2, 8-10.

268. *See, e.g.*, Natalie Hopkinson, *Park Vow Broken, Environmentalists Say*, ROCKY MOUNTAIN NEWS, Apr. 19, 1997, at 58A (commenting on the formation of an organization by 150 environmental groups to lobby Congress, called "Americans for Our Heritage and Recreation").

wilderness areas,[269] one of two dominant park system purposes,[270] and an important use of national wildlife refuges.[271] Even on multiple-use lands traditionally associated with commodity resources, federal statutes mandate that recreation be a principal use of BLM lands[272] and a coequal use of national forests.[273] Third, although Congress has never elevated recreational interests to true property rights,[274] it has provided the public with a license to use federal lands for recreation. This license, which derives both from federal statute[275] and judicial precedent,[276] provides Americans with access rights to public lands for recreation unless they are specifically revoked by Congress or the relevant federal land management agency.[277]

C. *Preservation as the Other Dominant Use*

In addition to recreation, preservation has become the other dominant public land use. The idea of preservation encompasses the notion that land and resources should be managed for the single purpose of keeping the area or object at issue in a natural state, not influenced by humans. When public land is reserved for preservationist reasons, it represents a conscious decision to dedicate land so that it yields two benefits: (1) environmental services derived from watershed protection, water purification, biodiversity enhancement, and ecosystem health; and (2) recreational opportunities for low-impact human use.

As noted in Part I, preservational uses now dominate a significant portion of our public lands.[278] Preservation controls fed-

---

269. *See* 16 U.S.C. § 1133 (d)(5) (1994).

270. *See* 16 U.S.C. § 1 (1994). *See generally* Jeffery, *supra* note 7, at 97-103.

271. *See* 16 U.S.C. § 668dd (1994).

272. *See* 43 U.S.C. § 1702(c) (1994).

273. *See* 16 U.S.C. § 528 (1994). In addition, environmental impact analyses under NEPA consider the effect of proposed federal projects on recreational interests. *See generally* Hughes River Watershed Conservancy v. Glickman, 81 F.3d 437, 446-47 (4th Cir. 1996).

274. *See* COGGINS & GLICKSMAN, *supra* note 2, § 17.02; *see also* Light v. United States, 220 U.S. 523 (1911) (upholding congressional authority to deny or condition recreational privileges on public lands).

275. *See, e.g.*, 16 U.S.C. § 460k (1994).

276. *See, e.g.*, United States v. Curtis-Nevada Mines, Inc., 611 F.2d 1277, 1283-84 (9th Cir. 1980); Everett v. United States, 980 F. Supp. 490, 492-93 (D.D.C. 1997).

277. *See* COGGINS & GLICKSMAN, *supra* note 2, § 17.02. Agency managers do not seem inclined to diminish the effectiveness of the recreation license. *See* Timothy Egan, *Get Used to New West, Land Managers Tell the Old West*, N.Y. TIMES, Feb. 12, 1998, at A10.

278. *See* COGGINS & GLICKSMAN, *supra* note 2, at G-2 ("[P]reservation [is] a dominant federal land use."); *see also* Daniels, *supra* note 7, at 483-84, 500-01.

eral lands subject to the Wilderness Act of 1964[279] and the 1968 Wild and Scenic Rivers Act.[280] It is a coequal purpose of the national park system[281] and a principal use of national wildlife refuges.[282] Certain resources, notably endangered and threatened wildlife species[283] and wetlands,[284] have been singled out for preservation treatment. Even BLM and Forest Service lands, normally subject to multiple-use management and considered suitable for commodity development, must conform to preservation ends if they have been designated as wilderness, wilderness study areas, "roadless" areas, or national monuments.[285]

The use of preservation as an organizing principle for the management of public lands is due to four recent phenomena: (1) the rise of a wilderness ethic;[286] (2) the emergence of biodiversity and ecosystem management;[287] (3) a growing awareness that preservation lands hold economic value;[288] and (4) the impressive political clout of environmental organizations that espouse preservation values.[289]

1. *Wilderness*

The idea of wilderness as a preferred use of public lands has a long history in this country. The flowering of Romanticism in the eighteenth and early nineteenth centuries brought with it the view that there was an association between God and wilder-

279. 16 U.S.C. §§ 1131-1136 (1994).
280. 16 U.S.C. §§ 1271-1287 (1994).
281. *See* 16 U.S.C. § 1 (1994).
282. *See* 16 U.S.C. §§ 668dd-668ee (1994).
283. *See* 16 U.S.C. §§ 1531-1544 (1994).
284. *See* 33 U.S.C. § 1344 (1994).
285. *See* 43 U.S.C. § 1782(c) (1994) (wilderness study areas on BLM lands); *see also* Parker v. United States, 448 F.2d 793 (10th Cir. 1971) (wilderness study areas on national forest lands); COGGINS & GLICKSMAN, *supra* note 2, §§ 14B.01 through 14B.02[4] (wilderness designation); John F. Shepherd, *Up the Grand Staircase: Executive Withdrawals and the Future of the Antiquities Act*, 43 ROCKY MT. MIN. L. INST. 4-1 (1997); Tom Kenworthy, *Montana Wilderness Off-Limits*, DENVER POST, Sept. 24, 1997, at A1 (describing the Forest Service's decision to place Montana's Rocky Mountain Front off limits to future oil and gas drilling); Adriel Bettelheim, *Conservationists Applaud BLM Act*, DENVER POST, Sept. 14, 1997, at 29A (BLM declaring 162,000 acres of federally owned canyonlands in western Colorado to be roadless and off limits to oil and gas drilling by Marathon Oil).
286. *See generally* RODERICK NASH, WILDERNESS AND THE AMERICAN MIND (1967).
287. *See* Oliver A. Houck, *On the Law of Biodiversity and Ecosystem Management*, 81 MINN. L. REV. 869 (1997).
288. *See, e.g.*, RAY RASKER ET AL., THE WEALTH OF NATURE: NEW ECONOMIC REALITIES IN THE YELLOWSTONE REGION (1992).
289. *See, e.g.*, Richard L. Berke, *In a Reversal, G.O.P. Courts The 'Greens,'* N.Y. TIMES, July 2, 1997, at A1.

ness.[290] Transcendentalists like Thoreau and Emerson pointed out the value of the unspoiled natural world to Americans, who were beginning to sort out the proper relationship with their physical world.[291] Nineteenth century artists such as John James Audubon, poets such as William Cullen Bryant, and landscape architects such as Frederick Law Olmsted even began to express concern over the loss of wilderness, a step that typically precedes the first call for its protection.[292]

Throughout the twentieth century, wilderness preservation was advocated by a number of commentators and government officials whose views are still influential. These champions of wilderness articulated different, but consistent, rationales for a preservationist philosophy about public lands. John Muir's ideas, for instance, developed as a result of observing what he perceived to be the stifling effects of civilization and urbanization.[293] Aldo Leopold saw wilderness as a means of protecting diminishing supplies of big game, fish, and waterfowl.[294] He also correctly predicted that wilderness would both serve as a draw for recreational enthusiasts[295] and permit management of these lands on an ecosystem basis.[296] Bob Marshall was able to convince the Forest Service to set aside large tracts of roadless national forests because, like Leopold, he understood their role not as a commodity resource, but as a recreation destination for growing numbers of Americans.[297] Edward Abbey fought to preserve public lands because "[w]e need wilderness whether or not we ever set foot in it. . . . I may never in my life get to Alaska, for example, but I am grateful that it's there."[298]

These wilderness defenders eventually captured the hearts

290. *See* NASH, *supra* note 286, at 45-47.

291. *See, e.g.*, RALPH WALDO EMERSON, NATURE (Kenneth Walter Cameron ed., 1940) (1836); SHERMAN PAUL, EMERSON'S ANGLE OF VISION: MAN AND NATURE IN AMERICAN EXPERIENCE (1952); HENRY DAVID THOREAU, WALDEN (J. Lyndon Shanley ed., Princeton Univ. Press 1971) (1854).

292. JOHN JAMES AUDUBON, DELINEATIONS OF AMERICAN SCENERY AND CHARACTER 4, 9-10 (Francis Hobart ed., 1926); WILLIAM CULLEN BRYANT, LETTERS OF A TRAVELLER; OR, NOTES OF THINGS SEEN IN EUROPE AND AMERICA 302 (New York, G.P. Putnam 1850); NASH, *supra* note 286, at 106.

293. JOHN MUIR, MY FIRST SUMMER IN THE SIERRA 250 (1911).

294. *See* NASH, *supra* note 286, at 183.

295. *See generally* JAMES M. GLOVER, A WILDERNESS ORIGINAL: THE LIFE OF BOB MARSHALL (1986).

296. *See* NASH, *supra* note 286, at 192-94.

297. *See* GLOVER, *supra* note 295, at 94, 145-47, 215, 262.

298. EDWARD ABBEY, DESERT SOLITAIRE: A SEASON IN THE WILDERNESS 129 (1968). Abbey is referring to the "existence" value of wilderness, which is also an economic value that can be measured by the contingent valuation method. *See* discussion *infra* Part IV.

and minds of many Americans, who increasingly saw public lands as a cathedral of nature, rather than as a source of raw materials for economic growth. These sacrosanct lands were thought to be threatened by mining, forestry, grazing, and water projects.[299] Congress passed a host of wilderness protection statutes in response to this rising tide of hostility to the extractive use of natural resources on public lands.[300] Designated wilderness areas were created in national forests and BLM lands, and roadless and "de facto" wilderness areas (wilderness study areas) were set aside.[301] There was an increase in the number of units of the National Park System and an expansion of the National Wildlife Refuge System. Additionally, concern over endangered and threatened species of wildlife led to the effective designation of habitats as wilderness. All this relentless wilderness protection has dramatically reduced the acreage of multiple-use public lands available for commodity use.

2. *Biodiversity and Ecosystem Management*

Wilderness is not the only way in which preservation goals have begun to dominate public land use. In the latter part of the twentieth century, biologists recognized the importance of interrelated biological systems and applied scientific methodology to understand how such systems function. New scientific insights concerning both the vulnerabilities of the ecosystem to human pollution (for example, from DDT and acid rain) and the human reliance on a healthy environment prompted mainstream environmental groups and government officials to embrace an ecological perspective. This new perspective was based on the notion that nature, unspoiled by humans, is the central organizing principle of ecosystem health, and therefore more emphasis should be placed on protecting the integrity of native ecosystems. Ecology underscored the importance of preservation because it assumed that all living things, including people, would in the long run thrive best when surrounded by a healthy natural environment. Such an environment was, by necessity, one that had not been damaged by human activities that disrupted the natu-

299. *See* CHASE, *supra* note 193, at 203.

300. *See generally* J. William Futrell, *Parks to the People: New Directions for the National Park System*, 25 EMORY L.J. 255 (1976); Lynn A. Greenwalt, *The National Wildlife Refuge System*, *in* WILDLIFE AND AMERICA: CONTRIBUTIONS TO AN UNDERSTANDING OF AMERICAN WILDLIFE AND ITS CONSERVATION 399 (Howard P. Brokaw ed., 1978).

301. *See* Mark Eddy, *Wilderness Expansion Backed*, DENVER POST, Apr. 8, 1998, at B1.

ral state of land.[302]

Several consequences flow from a land management philosophy based on biocentric ecology. Commodity production can be tolerated only if it does not interfere with the preservation of natural systems.[303] Original conditions such as old growth forests are to be protected because they are most consistent with 'a healthy ecosystem.[304] Modern ecology presumes that all species, not just those on the brink of doom, need to be safeguarded.[305] The preservation movement draws upon these ecological themes to support protection of natural processes and linkages.[306]

The science of ecology and the premises of biocentrism have given birth to the notion that public lands agencies should manage *ecosystems* and protect *biological diversity.* While varying definitions of "ecosystem management" exist, it generally describes management to protect both the organisms living in a particular environment and the physical environment that affects them.[307] Ecosystem management should be on a large enough scale, both geographically and temporally, to guard against species loss, to reflect the interconnectedness among living things, and to ensure sustainable resource systems.[308]

---

302. *See, e.g.*, FRANK BENJAMIN GOLLEY, A HISTORY OF THE ECOSYSTEM CONCEPT IN ECOLOGY: MORE THAN THE SUM OF THE PARTS (1993); ALSTON CHASE, PLAYING GOD IN YELLOWSTONE: THE DESTRUCTION OF AMERICA'S FIRST NATIONAL PARK (1986); FREDERICK TURNER, REDISCOVERING AMERICA: JOHN MUIR IN HIS TIME AND OURS (1985); ERNST MAYR, THE GROWTH OF BIOLOGICAL THOUGHT: DIVERSITY, EVOLUTION, AND INHERITANCE (1982); SUSAN L. FLADER, THINKING LIKE A MOUNTAIN: ALDO LEOPOLD AND THE EVOLUTION OF AN ECOLOGICAL ATTITUDE TOWARD DEER, WOLVES, AND FORESTS (1974); BARRY COMMONER, THE CLOSING CIRCLE: NATURE, MAN, AND TECHNOLOGY (1971).

303. *See generally* RUDZITIS, *supra* note 6, at 37; Christopher A. Wood, *Ecosystem Management: Achieving the New Land Ethic*, RENEWABLE RESOURCES J., Spring 1994, at 6.

304. *See* Joel B. Hagen, AN ENTANGLED BANK: THE ORIGINS OF ECOSYSTEM ECOLOGY 175 (1992); *see also* ELLIOTT A. NORSE, ANCIENT FORESTS OF THE PACIFIC NORTHWEST (1990).

305. *See generally* REED F. NOSS & ROBERT L. PETERS, ENDANGERED ECOSYSTEMS: A STATUS REPORT ON AMERICA'S VANISHING HABITAT AND WILDLIFE (1995); BRYAN G. NORTON, WHY PRESERVE NATURAL VARIETY? (1987); J. Michael Scott et al., *GAP Analysis of Species Richness and Vegetation Cover: An Integrated Biodiversity Conservation Strategy, in* BALANCING ON THE BRINK OF EXTINCTION: THE ENDANGERED SPECIES ACT AND LESSONS FOR THE FUTURE 282 (Kathryn A. Kohm ed., 1991).

306. *See generally* ALFRED RUNTE, NATIONAL PARKS: THE AMERICAN EXPERIENCE 197-208 (2d ed. rev. 1987).

307. *See* EDWARD O. WILSON, THE DIVERSITY OF LIFE 396 (1992).

308. *See, e.g.*, NATURE'S SERVICES: SOCIETAL DEPENDENCE ON NATURAL ECOSYSTEMS (Gretchen C. Daily ed., 1997); Robert B. Keiter, *Beyond the Boundary Line: Constructing a Law of Ecosystem Management*, 65 U. COLO. L. REV. 293, 301 (1994); U.S. FISH AND WILDLIFE SERVICE, AN ECOSYSTEM APPROACH TO FISH AND WILDLIFE CONSERVATION 6 (1994). There may be as many as seven distinct federal agency definitions of ecosystem management. *See* Richard Haeuber, *Setting the Environmental*

"Biological diversity" (or biodiversity) refers to the diversity of life in all its forms, and all its levels of organization, and encompasses ecosystem, regional, species, and genetic diversity.[309]

Ecosystem management and biodiversity are inherently related and functionally interdependent. An array of large, intact ecosystems is necessary to support healthy and diverse living organisms, while ecosystems cannot survive without biodiversity.[310] Both have linkages to the two new dominant uses on public lands— recreation and preservation. Ecosystem management does not focus exclusively on the conservation of biological diversity; rather, it assumes that human communities must be considered part of the ecosystem and that there will be human-induced impacts on certain ecosystems, such as those associated with recreation.[311] Preservation is also an important component of biodiversity and ecosystem management because of the science of "conservation biology." This ecological theory posits that large areas of undisturbed habitat should be preserved to ensure the genetic diversity and sustainability of species.[312]

Ecosystem management and biodiversity are not merely abstract ideas without a role in planning and policymaking for public lands management. Although the courts have been re-

---

Policy Agenda: The Case of Ecosystem Management, 36 NAT. RESOURCES J. 1, 25 (1996) (listing seven governmental agency definitions of "Ecosystem Management"); *see also* George Cameron Coggins, *Legal Problems and Powers Inherent in Ecosystem Management*, 5 NAT. RESOURCES AND ENVTL. ISSUES 36 (1995) (commenting on the problems posed by the absence of a single definition).

309. *See generally* Bradley C. Karkkainen, *Biodiversity and Land*, 83 CORNELL L. REV. 1 (1997); REED F. NOSS & ALLEN Y. COOPERRIDER, SAVING NATURE'S LEGACY: PROTECTING AND RESTORING BIODIVERSITY 5 (1994); MALCOLM L. HUNTER, WILDLIFE, FORESTS, AND FORESTRY: PRINCIPLES OF MANAGING FORESTS FOR BIOLOGICAL DIVERSITY 7 (1990).

310. *See, e.g.*, S. Dillon Ripley & Thomas E. Lovejoy, *Threatened and Endangered Species*, *in* WILDLIFE AND AMERICA 365 (Howard P. Brokaw ed., 1978); *see also* WILSON, *supra* note 307, at 259-70; CHASE, *supra* note 193, at 105:

> When asked, 'Why prevent species extinction?,' [the] architects and supporters [of the Endangered Species Act] usually replied, 'To protect ecosystem health.' When asked to characterize this health further, they answered, 'biodiversity.' When queried about the reason for biodiversity, they replied that it was to ensure 'ecosystem stability.'

311. *See* Michael E. Soulé, *What is Conservation Biology?*, 35 BIOSCENCE 727 (1985); *see also* ECOSYSTEM MANAGEMENT FOR PARKS AND WILDERNESS 226-27 (James K. Agee & Darryll R. Johnson eds., 1988); Keiter, *supra* note 308, at 302-03.

312. *See* NOSS & COOPERRIDER, *supra* note 309, at 141; *see also* Rebecca W. Thomson, *Ecosystem Management: Great Idea But What Is It, Will It Work, and Who Will Pay?*, NAT. RESOURCES & ENV'T, Winter 1995 at 42; Neil Gunningham & Mike D. Young, *Toward Optimal Environmental Policy: The Case of Biodiversity Conservation*, 24 ECOLOGY L.Q. 243 (1997).

luctant to impose ecosystem management and biodiversity mandates on multiple use agencies,[313] both concepts are beginning to guide federal agencies that historically have conformed their decisions to a multiple-use philosophy. The President's Council on Environmental Quality and the White House have promoted biodiversity and ecosystem planning on public lands.[314] Planning guides urging, but not mandating, ecosystem management have been adopted by the BLM,[315] Forest Service,[316] and Fish and Wildlife Service.[317] Even though their enabling statutes do not expressly set out an ecosystem management or biodiversity imperative,[318] multiple-use agencies have nonetheless launched several initiatives consistent with these principles.[319]

---

313. *See, e.g.*, Krichbaum v. Kelley, 844 F. Supp. 1107, 1115 (W.D. Va. 1994) (noting that the Forest Service is not required to measure diversity by looking to the "naturally occurring forest ecosystems," observing that "[e]very prodiversity command in the regulatory scheme is qualified to permit multiple-use management goals"); Sierra Club v. Robertson, 845 F. Supp. 485, 502 (S.D. Ohio 1994) ("Diversity is not the controlling principle in forest planning, although it is an important goal to be pursued in the context of overall multiple-use objectives."); Sierra Club v. Robertson, 810 F. Supp. 1021, 1028 (W.D. Ark. 1992) (noting that Forest Service methodology need not include plaintiff's biodiversity theory); Public Lands Council v. Dep't of Interior, 929 F. Supp. 1436 (D. Wyo. 1996) (voiding BLM regulations intended in part to restore the natural ecosystems of the public range); Jeb Boyt, *Struggling to Protect Ecosystems and Biodiversity Under NEPA and NFMA: The Ancient Forests of the Pacific Northwest and the Northern Spotted Owl*, 10 PACE ENVTL. L. REV. 1009 (1993).

314. *See generally* COUNCIL ON ENVIRONMENTAL QUALITY, EXECUTIVE OFFICE OF THE PRESIDENT, INCORPORATING BIODIVERSITY CONSIDERATIONS INTO ENVIRONMENTAL IMPACT ANALYSIS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT (1993); 1 INTERAGENCY ECOSYSTEM MANAGEMENT TASK FORCE, THE ECOSYSTEM APPROACH: HEALTHY ECOSYSTEMS AND SUSTAINABLE ECONOMIES (1995).

315. *See* BUREAU OF LAND MANAGEMENT, U.S. DEP'T OF THE INTERIOR, ECOSYSTEM MANAGEMENT IN THE BLM: FROM CONCEPT TO COMMITMENT (1994).

316. *See* DEP'T OF AGRIC., U.S. FOREST SERVICE, A NATIONAL FRAMEWORK ECOSYSTEM MANAGEMENT: FOUR FUNDAMENTAL PRINCIPLES GUIDE THE IMPLEMENTATION OF ECOSYSTEM MANAGEMENT (1994).

317. U.S. FISH AND WILDLIFE SERVICE, U.S. DEP'T OF INTERIOR, AN ECOSYSTEM APPROACH TO FISH AND WILDLIFE CONSERVATION (1994).

318. *See, e.g.*, National Forest System Land and Resource Management Planning, 60 Fed. Reg. 18,886, (1995) (noting that ecosystem analyses are not mandatory preconditions to decisionmaking under the National Forest Management Act (NFMA); 60 Fed. Reg. 18, 894-97 (removing the concept of biological diversity from regulations governing NFMA plans). *But cf.* Keiter, *supra* note 308, at 303-14 (arguing that "[w]ithin the framework of contemporary public land and natural resource management law, a de facto law of ecosystem management is now emerging. . . .").

319. *See, e.g.*, Houck, *supra* note 287, at 891-920, 931-946; Heidi McIntosh, *National Forest Management: A New Approach Based on Biodiversity*, 16 J. OF ENERGY, NATURAL RESOURCES, AND ENVIRONMENTAL LAW (1996); J.B. Ruhl, *Biodiversity Conservation and the Ever-Expanding Web of Federal Laws Regulating Nonfederal Lands: Time for Something Completely Different?*, 66 U. COLO. L. REV. 555 (1995); Park Lake Resources Ltd. Liab. Corp. v. Dep't of Agric., 979 F. Supp. 1310, 1311-12 (D. Colo. 1997) (discussing Research Natural Areas within National Forests, which are lands permanently protected to maintain biological diversity).

3. *Preservation as an Economic Good*

Often, the key economic asset associated with public lands is not linked to an extractive activity. Instead, public lands are economically important because of their value as recreational destinations,[320] or their worth when preserved in a natural state.[321] Preserved lands become economic assets in much the same way that timber, minerals, and forage do. Protecting public lands from mining, logging, and ranching preserves nonconsumptive, nonextractive "amenity"[322] and "landscape" values.[323] These values, which encompass clean air and water, biodiversity, and scenic beauty, serve to attract new residents and businesses, and retain them over time. For example, some surveys reveal that traditional reasons for locating a business, such as proximity to raw materials and availability of labor and capital, rank comparatively low in decisions to move to an area near public lands. Instead, "quality environment" and "scenic beauty" are important to business owners.[324] Surveys of new residents in the West have found that employment opportunities are less important reasons for relocating than the social and physical environment, opportunities for outdoor recreation, and the landscape.[325]

Amenity and landscape values are especially high in areas adjacent to designated federal preservation lands. One study has found that many people have chosen to move to, or build second homes near, areas abutting wilderness and national parks. As a consequence, counties adjacent to preservation areas have grown, on average, twice as fast as metropolitan areas.[326] The results of such studies have led economists to con-

320. *Cf.* Con H. Schallau, *Evolution of Community Stability as a Forestry Issue: Time for the Dry Dock*, *in* COMMUNITY STABILITY IN FOREST-BASED ECONOMIES 8 (Dennis C. Le Master & John H. Beuter eds., 1989) (noting that "diversification is an appropriate long-term goal for some timber-dependent communities," and that "tourism and recreation . . . may be the solution").

321. *Cf.* Bonnie S. Martin & Muzaffer Uysal, *An Examination of the Relationship Between Carrying Capacity and the Tourism Lifecycle: Management and Policy Implications*, 31 J. ENVTL. MGMT. 327 (1990) (arguing that a link exists between carrying capacity and the "tourism lifecycle concept," suggesting that tourist destinations may maintain their attractiveness to tourists if managed with carrying capacity in mind).

322. *See* Rasker, *supra* note 165, at 380 (describing the quality of life in areas near preservation lands as having "amenity" value).

323. *See* POWER, *supra* note 6, at 236-37 (pointing out that noncommercial, nonconsumptive natural "landscape" values are rising in importance in the West).

324. *See generally* Rasker, *supra* note 165, at 381-82.

325. *See* RUDZITIS, *supra* note 6, at 114-16.

326. *See* Gundars Rudzitis & Harley E. Johansen, *How Important is Wilderness? Results From a United States Survey*, 15 ENVTL. MGMT. 227, 227-33 (1991).

clude that protected public lands have become a central part of the local economic base. Since people care where they live, and because businesses care where labor supplies and markets are located, desirable environments that attract and retain entrepreneurs and workers have an economic worth of their own. The economic worth of such environments is significant when they are preserved in a natural state and not subject to resource extractive activities.[327]

Apart from amenity and landscape worth, some ecologists and economists believe it is possible to calculate a dollar value for the natural world. They have argued that protected natural lands perform valuable "ecosystem services," without which the human economy could not exist. Because people cannot duplicate them as cheaply, or at all, these naturally occurring services have measurable value. One group of scientists has estimated the global value of seventeen essential ecosystem services (for example, climate and water regulation, natural waste treatment, and nutrient cycling) at $33 trillion, most of which is normally not reflected in market prices. This estimate compares with $18 trillion as the value of all the goods and services provided by the world's people each year.[328]

4. *The Political Power of Preservation*

Preservation has been an important and influential rallying cry both outside and inside the political process. Scientists have warned that human activities are seriously harming the earth's life support systems and that extractive uses of natural resources should be minimized and restoration/preservation of nature maximized.[329] Concern over dwindling natural areas has forged alliances between two longtime adversaries— ranchers and environmentalists. Both are fearful that tourism and the second-home industry are carving up so much land that it is beginning to threaten the very landscape that draws people to public lands.[330]

---

327. *See* POWER, *supra* note 6, at 14, 17, 21 (suggesting that economists should not use per capita income or money wages alone to measure local prosperity, but instead should adjust for the local cost of living and add the value of goods and services residents receive from the natural environment).

328. *See* William K. Stevens, *How Much is Nature Worth? For You, $33 Trillion*, N.Y. TIMES, May 20, 1997, at B7, B9.

329. *See, e.g.*, Heather Dewar, *Earth's Life-Support Systems Rated Seriously Ill*, DENVER POST, July 25, 1997, at A1 (reporting on a 1997 study published in the research journal *Science*).

330. *See* James Brooke, *Rare Alliance in the Rockies Strives to Save Open Spaces*,

Public interest environmental organizations, created as a result of this increased public interest in conservation and preservation, have effectively advocated for preservation of public lands in their natural state. These public interest groups have initiated court actions and legislative efforts to force nonconsumptive, noncommodity use of public resources.[331] Even charitable foundations have helped mobilize interest in wilderness. Many foundations that support preservation, including the Pew Charitable Trust, the Bullitt, and the Alton Jones Foundations, have backed sophisticated media efforts to publicize real and imagined threats to public lands.[332]

Political machinations between and within federal lands agencies have also resulted in an increase in public lands set aside for preservationist purposes. The original multiple-use agency, the Forest Service, first decided to prevent roads into wilderness areas because of its desire to prevent the National Park Service from gaining jurisdiction over several tracts of forested lands. The Forest Service was concerned about the aggressive leadership of the Park Service's first director, Stephen Mather, who had proposed that a great many national forest areas be added to the growing park system.[333]

More recently, the Forest Service and the BLM have announced their interest in regulating their lands consistent with a theory that is becoming politically popular— ecosystem management.[334] Since this management philosophy contends that commodity resources like woods and grasslands are healthy only when unfettered biodiversity predominates,[335] human exploitation of these resources on public lands is discouraged as being detrimental to ecosystem health. Conversely, ecosystem man-

---

N.Y. TIMES, Aug. 14, 1998, at A1.

331. *See* George Cameron Coggins, *Some Disjointed Observations on Federal Public Land and Resources Law*, 11 ENVTL. L. 471, 491 (1981) ("The rise of active public interest law firms . . . may be the most important factor in the development of modern public land and resources law."); *see also* Tennessee Valley Auth. v. Hill, 437 U.S. 153 (1978) (halting construction of a dam to protect a wildlife species); Izaak Walton League v. Butz, 522 F.2d 945 (4th Cir. 1975) (enjoining clearcutting in national forests); Parker v. United States, 448 F.2d 793 (10th Cir. 1971) (invalidating timber contracts to preserve an area as de facto wilderness); CHASE, *supra* note 193, at 1 ("Formerly staid conservation groups grew into professional lobbying organizations with tremendous clout in Washington."); Peter Dykstra, Comment, *Defining the Mother Lode: Yellowstone National Park v. New World Mine*, 24 ECOLOGY L.Q. 299 (1997).

332. *See generally* DAVID HELVARG, THE WAR AGAINST THE GREENS (1994); CHASE, *supra* note 193, at 378-79.

333. *See* GLOVER, *supra* note 295, at 94, 262-63.

334. *See supra* notes 315-316.

335. *See* CHASE, *supra* note 193, at 401-02.

agement encourages the preservation of large tracts of land.[336]

III

THE CURRENT PUBLIC LANDS MANAGEMENT PHILOSOPHY IN A DOMINANT USE PARADIGM

Parts I and II have illustrated that commodity resource uses of public lands are in decline,[337] while recreation and preservation uses are becoming more dominant,[338] even on multiple-use lands.[339] These use preferences exist on BLM lands and national forests, despite the fact that the BLM and the Forest Service have traditionally managed their lands for commodity exploitation.[340] The data summarized in Parts I and II also indicate that extractive industries do not play a central role in the economies of communities near public lands.[341] Conversely, public lands that offer recreational amenities, environmental quality, and protected ecosystems directly enhance local economic vitality.[342]

---

336. *See supra* note 308.

337. *See, e.g., Multiple Use and Sustained Yield: Changing Philosophies For Federal Land Management: Hearings Before the House Committee on Interior and Insular Affairs*, 103rd Cong. 23 (1992) [hereinafter *Cong. Res. Serv.*]:

> [The U.S.] economy has (or at least many believe it has) become less connected to manufacturing, especially primary processing of raw materials, and more dependent on the information and service sectors.

See also, e.g., CHARLES F. WILKINSON, THE EAGLE BIRD: MAPPING A NEW WEST 72-3 (1992) (noting that extractive uses of public lands, such as timber, mining, and grazing, may eventually be subordinated to "public" uses such as recreation and wildlife).

338. *See, e.g., 1-800-208-CAMP, The Call of the Wild*, THE ECONOMIST, Dec. 23, 1995-Jan. 5, 1996, at 33; DOUGLAS M. KNUDSON, OUTDOOR RECREATION 72-3 (1980); WILKINSON, *supra* note 337 (noting that the preservation of wildlife and watershed are becoming dominant uses of public lands).

339. *See* INTRODUCTION TO RECREATION RESOURCES, *supra* note 223, at 5 (noting that BLM lands include 2,000 miles of National Wild and Scenic Rivers, 6,120 miles of trails, 1,563,705 acres of National Wilderness Areas, and 1,000,000 acres in National Recreation Areas); RECREATION 2000 UPDATE, *supra* note 223, at 4 (stating that BLM's objective is to "provide a clear image of BLM's role as a recreation provider"). *See generally* JAMES DUFFUS, III, U.S. GENERAL ACCOUNTING OFFICE, FOREST SERVICE: DIFFICULT CHOICES FACE THE FUTURE OF THE RECREATION PROGRAM 2 (1991) ("The 191 million acres of land administered by the Forest Service provide more recreational opportunities and record more recreation visitor use . . . than any other federal lands.").

340. *See* WILKINSON, *supra* note 2, at 3-27.

341. *See* Thomas M. Power, *The Wealth of Nature*, ISSUES IN SCIENCE AND TECHNOLOGY, Spring 1996, at 48, 49 ("Natural resource industries relying upon public lands are rarely responsible for more than a tiny sliver of regional employment.").

342. *See generally* Ian Rosenthal, Note, *The Case for Interstate Land Exchanges*, 15 VA. ENVTL. L.J. 357, 397 (1996) (noting that some individuals and businesses appreciate communities near federal lands administered by the Forest Service and the BLM that "provide scenic and recreational value"); *The Wealth of Nature*, *supra* note 341, at 52 (arguing that individuals' and businesses' preferences for "living environ-

The prominence of recreation and preservation on public lands, compared to extractive uses, raises the question of whether multiple-use agencies are managing their properties in a manner consistent with the reality of their use. Part III discusses the five assumptions that have traditionally guided BLM and Forest Service land management. After the discussion of each assumption, Part III analyzes how each is inherently flawed and thus inappropriate as a management ethic at a time when several new realities are driving public land use. Perhaps the most significant themes that emerge are that extractive uses have become subordinate to those of recreation and preservation and that future land use conflicts will not arise between commodity and recreation, but between recreation and preservation.

A. Assumptions Underlying Federal Land Management Policies

1. Assumption #1: Multiple Use is the Best Land Use Strategy

At the beginning of this century, when the federal government decided that it should retain ownership and management responsibilities over its extensive land holdings,[343] the primary issues became how it should manage its lands and the extent to which it should open them to commodity resource uses. For lands under the control of the BLM and the Forest Service, this debate over appropriate management philosophy was largely resolved by the eventual adoption of the multiple-use doctrine. From their earliest days, these two agencies have been subject to a statutory multiple-use mandate,[344] which requires them to manage their lands for a variety of potentially competing uses.[345] Multiple use is built on the assumption that land managers should be granted the discretion to permit the combination of uses on federal lands that provides "the greatest good for the greatest number in the long run."[346]

Two statutes require the Forest Service to manage its lands

---

ments" influence the location of economic activity).

343. *See generally* E. LOUISE PEFFER, THE CLOSING OF THE PUBLIC DOMAIN: DISPOSAL AND RESERVATION POLICIES 1900-50 (1951).

344. For a good succinct history of the genesis of multiple use management, see Hardt, *supra* note 7.

345. *See, e.g.*, 43 U.S.C. § 1712(c) (1994) (BLM); 16 U.S.C. §§ 529, 1604(e) (1994) (Forest Service).

346. *See generally* GIFFORD PINCHOT, BREAKING NEW GROUND (1947). The Multiple-Use Sustained Yield Act of 1960 similarly requires that resources on national forests be managed "so that they are utilized in the combination that will best meet the needs of the American people . . . ." 16 U.S.C. § 531(a) (1994).

consistent with a multiple-use philosophy. The Multiple Use-Sustained Yield Act of 1960 ("MUSY")[347] was the first to codify the modern notion of multiple use. It directs the Forest Service to manage national forests to simultaneously accomplish a range of different purposes such as outdoor recreation, fish and wildlife maintenance, timber harvesting, forage for livestock, and watershed protection.[348] Reviewing courts have determined that MUSY only requires the Forest Service to *consider* those optional multiple uses before committing a forest, or part of a forest, to a single use.[349] The National Forest Management Act of 1976 ("NFMA")[350] requires the Forest Service to coordinate competing national forest uses in light of resource management plans,[351] which must provide for multiple use of forest resources in accordance with MUSY.[352] NFMA adds "wilderness" to the list of various multiple uses permitted by MUSY.[353]

The Federal Land Policy and Management Act of 1976 ("FLPMA"),[354] mandates that BLM lands be managed for multiple use.[355] As with MUSY, the courts have interpreted FLPMA to require only that BLM consider various multiple uses; it does not mandate any particular mix of uses.[356] The list of multiple uses that must be considered under FLPMA include the commodity resources— minerals, timber, range— as well as recreation, fish

347. 16 U.S.C. §§ 528-531 (1994).

348. 16 U.S.C. § 528 (1994).

349. *See, e.g.*, National Wildlife Fed'n v. U.S. Forest Service, 592 F. Supp. 931, 938 (D. Or. 1984), *amended in part*, 643 F. Supp. 653 (D. Or. 1984), *vacated in part*, 801 F.2d 360 (9th Cir. 1986); *see also, e.g.*, Northwest Indian Cemetery Protective Ass'n v. Peterson, 565 F. Supp. 586 (N.D. Cal. 1983), *aff'd in part, vacated in part*, 764 F.2d 581 (9th Cir. 1985), *rev'd on other grounds sub nom.* Lyng v. Northwest Indian Cemetery Protective Ass'n, 485 U.S. 439 (1988); Dorothy Thomas Found., Inc. v. Hardin, 317 F. Supp. 1072, 1076 (W.D. N.C. 1970).

350. 16 U.S.C. §§ 1600-1614 (1994).

351. These plans were originally required by the Forest and Rangeland Renewable Resources Planning Act of 1974, Pub. L. No. 93-378, 88 Stat. 476 (codified at 16 U.S.C. §§ 1601-1610 (1994)).

352. 16 U.S.C. § 1604(e)(1) (1994); *see also* Paul Maynard Kakuske, Comment, *Clear-Cutting Public Participation in Environmental Law: The Emergency Salvage Timber Sale Program*, 29 LOY. L.A. L. REV. 1859, 1864 (1996) ("'[M]ultiple use' doctrine . . . requires that forest plans accommodate many activities in addition to timber harvest, including recreation and wildlife preservation.").

353. 16 U.S.C. § 1604(e)(1), (g)(3)(A) (1994). As with MUSY, courts have uniformly rejected the argument that multiple use principles in NFMA are enforceable limitations on Forest Service discretion to manage national forests for a single use such as timber harvesting. *See* COGGINS & GLICKSMAN, *supra* note 2, § 20.07.

354. 43 U.S.C. §§ 1701-1784 (1994).

355. 43 U.S.C. §§ 1701(a)(7), 1732(a) (1994).

356. *See, e.g.*, Headwaters, Inc. v. Bureau of Land Management, 914 F.2d 1174 (9th Cir. 1990).

and wildlife, watershed, and "natural scenic values."[357] FLPMA thereby takes to its logical extreme the "greatest good for the greatest number" multiple-use principle, requiring the BLM to recognize the need to develop commodity resources and to manage lands in a manner that protects environmental quality, promotes recreation, and preserves wilderness conditions.[358]

a. Reality: Multiple Use Should Not Be the Standard Guiding Public Lands Management Decisions

Multiple use resource management promised harmonious coordination of a variety of seemingly disparate and inconsistent land uses, as well as long-term, high-level natural resource development and production.[359] It has not fulfilled these promises. Most of the commodity resources industries that extract minerals, timber, and forage from multiple-use lands have required sizable federal subsidies that allow them to compete with the private sector.[360] This has resulted in resource over-utilization, waste, below-cost sales, and economic inefficiency.[361]

Where federal land management agencies have subsidized commodity resource development on public lands, serious conflicts have emerged when neighboring tracts under the control of these same agencies become designated or de facto wilderness areas. A preservation standard is not compatible with multiple-use policies that in the past fostered removal of resources from nature and were often destructive of the environment.[362] A similar difficulty has emerged with respect to the recreation resource.[363] Forest Service managers accustomed to timber harvesting as the preferred utilization of national forests[364] have had

357. 43 U.S.C. § 1702(c) (1994).

358. 43 U.S.C. § 1701(a)(8), (a)(12) (1994).

359. *See* George C. Coggins, *Of Succotash Syndromes and Vacuous Platitudes: The Meaning of "Multiple Use, Sustained Yield" for Public Land Management*, 53 U. COLO. L. REV. 229 (1982).

360. *See* WILKINSON, *supra* note 2, at 3-27; Blumm, *supra* note 7, at 411 ("[Multiple use] has produced a costly system of subsidies that has encouraged the destruction of natural resources . . . .").

361. Economic efficiency exists when more of one output cannot be produced without reducing the production of another, and when all benefits exceed all costs by the maximum amount possible. Inefficiency is the converse. *See* discussion *infra* Part IV; *see also* ROBERT T. DEACON & M. BRUCE JOHNSON, FORESTLANDS: PUBLIC AND PRIVATE (1985); GARY D. LIBECAP, LOCKING UP THE RANGE: FEDERAL LAND CONTROLS AND GRAZING (1981); Daniels, *supra* note 7, at 489-94.

362. *See* RUDZITIS, *supra* note 6, at 18, 23-24.

363. *See, e.g.*, 16 U.S.C. § 528 (1994). Recreation is also one of a number of multiple uses permitted on BLM lands. *See* 43 U.S.C. § 1702(c) (1994).

364. *See* Arnold W. Bolle, *The Bitterroot Revisited: A University Review of the Forest*

to confront the reality that its 191 million acres provide more recreational opportunities, and record more recreation visitor use, than any other federal lands.[365] Clearcutting cannot accommodate this level of recreational use. Given its traditional commodity development focus, it is not surprising that the Forest Service has an enormous backlog of unmet recreational maintenance and reconstruction needs, as well as staffing levels that are not sufficient to bring recreational sites up to the condition called for by Forest Service plans.[366]

Multiple use has several inherent limitations that explain its failure to achieve its goal of simultaneously satisfying a variety of land use objectives. First, it is impractical to expect multiple-use agencies to manage each unit of land for a large number of outputs when those uses conflict. One cannot increase the acres of timber harvested, or the tons of minerals mined, without decreasing the acres available for recreation. In an era when preservation and recreation are the dominant uses, industries that depend on federal lands for extractive resources cannot thrive. Indeed, some commentators have concluded that the most incompatible of all possible uses of public lands are commodity production, preservation, and intensive recreation.[367]

Second, when a single use seems better suited to a particular parcel of land than many uses, multiple use's focus on multiple outputs for that parcel limits the maximum quantity of production that can derive from the suitable use. For example, if a national forest is ecologically and geographically capable of supporting recreation, and if the surrounding communities wish to use the forest for recreation, federal land managers wedded to multiple use may restrict opportunities for recreation by opening the forest to timber harvesting and oil and gas leasing. In such a case, permitting commodity use of the forest diminishes the level of recreation that would otherwise be achieved, thereby reducing the benefit of the single output for which the public land is best suited.[368]

Service, 10 PUB. LAND L. REV. 1, 11 (1989) (noting that "timber primacy, which now dominated and controlled Forest Service activity . . . marked a clear departure from the broader Congressional policy of multiple use as earlier conceived").

365. *See* U.S. GENERAL ACCOUNTING OFFICE, FOREST SERVICE: DIFFICULT CHOICES FACE THE FUTURE OF THE RECREATION PROGRAM 2 (1991).

366. *See* U.S. GENERAL ACCOUNTING OFFICE, RESOURCE LIMITATIONS AFFECT CONDITION OF FOREST SERVICE RECREATION SITES 1 (1991); *see also* DIFFICULT CHOICES, *supra* note 365, at 2-3.

367. *See, e.g.*, Marion Clawson, *The Concept of Multiple Use Forestry*, 8 ENVTL. L. 281, 286 (1978).

368. *See generally* Daniels, *supra* note 7, at 503-04.

Third, because multiple-use statutes fail to provide clear standards, [369] one can argue that it will inevitably evolve into a dominant use strategy.[370] In part, this is because society and its lawmakers will eventually pass dominant use management statutes to control and protect resources of particularly high value.[371] The National Park Service Act,[372] the National Wildlife Refuge System Administration Act,[373] the Wilderness Act,[374] and the Endangered Species Act[375] are all examples of dominant use federal statutes that override multiple-use criteria whenever they are applied to multiple-use public lands. Even without such statutes, managers will eventually find that they must dedicate specific land areas to single uses, when other uses are incompatible with that use and the land is naturally well adapted to it.[376]

2. *Assumption #2: Dominant Use is Both Inconsistent with Federal Land Management Statutes and Undesirable*

Multiple use focuses on the production of more than one output from individual parcels of land. The two federal multiple-use agencies, the BLM and Forest Service, seek to implement their statutory multiple-use charge by assuming that virtually all the resources that exist on each unit of land can be managed to yield the maximum number of outputs.[377] By contrast, dominant use management identifies lands suited to specific uses and devotes them to those uses. Secondary uses are permitted under a dominant use regime only if they are consistent with that dominant use.[378]

Federal land managers have long assumed that BLM and Forest Service lands should be subject to a multiple use, but not

---

369. *See* George C. Coggins, *"Devolution" in Federal and Land Law: Abdication By Any Other Name*, 3 HASTINGS W.-NW. J. ENVTL. L. 211, 214 (1996).

370. *See generally Cong. Res. Serv.*, *supra* note 337, at 23.

371. *See generally* Hardt, *supra* note 7, at 379-84.

372. 16 U.S.C. § 1 (1994).

373. 16 U.S.C. § 668dd(d) (1994).

374. 16 U.S.C. §§ 1131-1136 (1994).

375. 16 U.S.C. §§ 1531-1544 (1994).

376. New Zealand abandoned its multiple use criteria for timber producing lands after it realized that these lands were better managed under a dominant use model. *See, e.g.*, Dale A. Oesterle, *Public Land: How Much is Enough?*, 23 ECOLOGY L.Q. 521, 569-70 (1996).

377. *See generally* Clawson, *supra* note 367.

378. *See* Daniels, *supra* note 7 (arguing that dominant use is based on the assumption that if different tracts are well-suited to particular outputs, then production of those various specialized outputs would, in the aggregate, maximize total production of all outputs).

a dominant use, land management strategy.[379] For example, one past Director of Land Management Planning for the Forest Service argued that while "[t]here are still skeptics who would argue for a single [dominant] use, . . . there is much to be lost under the single use concept."[380] Dominant use has seemed unacceptable for two reasons. First, multiple use, not dominant use, was explicitly adopted by Congress as the statutory mandate for managing BLM and Forest Service lands.[381] Moreover, even though the Public Land Law Review Commission endorsed the concept of dominant use for BLM lands in the early 1970s,[382] its recommendation was entirely ignored (and implicitly rejected) by Congress when it enacted FLPMA in 1976.[383]

Second, apart from statutory commands, dominant use has seemed to be too restrictive and confining, especially when compared with the promise of multiple use. Dominant use management allows only for the production of a particular commodity or resource in a particular location. Literally interpreted, dominant use would require that every acre in a national forest, or BLM district, be devoted to just a single use.[384] Multiple use, by contrast, assumes that simultaneous pursuit of the development of all resources and commodity outputs will be vastly more productive than that possible if management was according to dominant use principles.[385]

a. Reality: Dominant Use is Both Inevitable and Desirable

Although multiple use is the statutory land management mandate for the BLM and Forest Service, dominant use has be-

379. *See generally Cong. Res. Serv., supra* note 337, 89-93 (comments prepared by James H. Magagna, Rancher and President, American Sheep Industry Association).

380. Hartgraves, The Role of Planning in Multiple Use Management, in Multiple-Use Management of Forest Resources 191 (Proceeding of the Symposium on Multiple Use, Clemson, S.C., Sept. 1979).

381. *See supra* notes 344-53 and accompanying text; *see also* COGGINS & GLICKSMAN, *supra* note 2, § 16.01[1].

382. *See* PUBLIC LAND LAW REVIEW COMMISSION, ONE THIRD OF THE NATION'S LAND: A REPORT TO THE PRESIDENT AND TO THE CONGRESS BY THE PUBLIC LAND LAW REVIEW COMMISSION 3 (1970).

383. FLPMA's command to BLM is to manage according to multiple use principles. 43 U.S.C. §§ 1701(a)(7), 1712(c)(1) (1994).

384. Environmentalists have long been concerned that dominant use could allow commodity users to argue for a single resource extractive use of a large area, such as harvesting throughout a national forest. *See* SAMUEL TRASK DANA & SALLY K. FAIRFAX, FOREST AND RANGE POLICY: ITS DEVELOPMENT IN THE UNITED STATES 235 (2d ed. 1980).

385. *See generally Cong. Res. Serv., supra* note 337, at 31-43 (comments prepared by Perry R. Hagenstein, President, Resource Issues, Inc., and Institute for Forest Analysis, Planning, and Policy).

come the de facto land use for many national forests and areas under the jurisdiction of the BLM. Ironically, dominant use is in some ways inescapable for public lands because of the nature of multiple use. As pointed out above, multiple use tends to lead to single uses for specific tracts of lands. Moreover, this dominant use reality yields results that appear preferable to those expected under even a theoretical multiple-use model. Dominant uses achieve both economic benefits for local communities, as well as noncommodity ecological gains.

Many commentators have acknowledged the tendency of public lands managed pursuant to multiple-use precepts to be managed as dominant use lands.[386] Traditional multiple-use management of BLM or Forest Service lands often evolves into a single resource paradigm where particular uses, such as recreation or wildlife preservation values, or production values like minerals, timber, or rangeland development, become emphasized in certain lands to the point that they become dominant.[387] There are several reasons for this phenomenon. Traditional multiple use focuses on individual parcels of land, or aggregates of parcels,[388] that often do not have the carrying capacity to accommodate several competing uses. By contrast, land management philosophies that rely on a larger landscape scale, such as ecosystem management, permit specialized outputs like wilderness and preservation to flourish.

An argument can also be made that user groups take advantage of the broad discretion typically granted to them by multiple-use agencies. These groups employ lobbyists and use political connections in Congress to place enormous pressure on federal managers. The result is that certain user groups "capture" land management agencies over time. These captured agencies, in turn, ensure that public lands under their jurisdiction are put to a use consistent with the wishes of the user group.[389]

---

386. *See* COGGINS & GLICKSMAN, *supra* note 2, § 16.02[1]; Daniels, *supra* note 7, at 500.

387. *See, e.g.*, Murray Feldman, *Snake River Salmon and the National Forests: The Struggle for Habitat Conservation, Resource Development, and Ecosystem Management in the Pacific Northwest*, 3 HASTINGS W.-NW. J. ENVTL. L. 273, 289 (1996); Joseph Sax, *Proposals for Public Land Reform: Sorting Out the Good, the Bad, and the Indifferent*, 3 HASTINGS W.-NW. J. ENVTL. L. 187, 189 (1996); Steven Yaffee, *Lessons About Leadership From the History of the Spotted Owl Controversy*, 35 NAT. RESOURCES J. 381, 403 (1995).

388. *See, e.g.*, Daniels, *supra* note 7, at 499-500.

389. *See* Blumm, *supra* note 7, at 415-27; Jeffrey Taylor, *How Builder Del Webb Maneuvered to Win Prime Las Vegas Parcel*, WALL ST. J., Jan. 16, 1998, at 1 (dis-

The seeming inevitability of dominant use produces many benefits. First, and most obviously, if a single use is allowed to dominate a public land parcel, the difficulties associated with multiple use are avoided. Multiple use is usually interpreted to allow all possible uses on public lands, even those that conflict. Dominant use only permits uses that appear inherently compatible (for example, nonmechanized recreation and wilderness).[390]

Second, dominant use is more likely to achieve economic efficiency because of advantages of specialization. Dominant use favors outputs that are either conducive to a land's natural capabilities or responsive to marketplace demand. Outputs that are inconsistent with the dominant use will decline. Efficiency favors this result because the costs associated with the incompatible uses will exceed the costs of the use that has become dominant due to its better utilization of the land or its ability to satisfy a public need.[391] Multiple use cannot reap the benefits of specialization because it seeks to bring about equity (that is, to produce the same benefits from a parcel of land for all people), not efficiency.[392]

Third, when the dominant uses of recreation and preservation emerge, there are both economic and noneconomic benefits. Since communities near public lands experience the economic consequences of private uses of these lands, it is noteworthy that their economies become healthier when surrounding public lands are a source of nonconsumptive, environmental values. The economies of these communities benefit by the environmental goods and services offered from public lands used for recreation and preservation, perhaps more so than when these lands had value chiefly because they were a repository of commodity resources that could be extracted by private industry.[393] Lands set aside for human-powered recreation also bring out noneconomic physical and psychological gains,[394] while preservation of large segments of the public land base confers ecologi-

---

cussing how a Del Webb lobbyist and a Nevada Senator exerted pressure on BLM).

390. *See generally* Monica A. Genadio, *Toward a New Biodiversity Policy for Forest Management*, 2 WIS. ENVTL. L.J. 303, 317-18 (1995) (reviewing WILLIAM S. ALVERSON ET AL., WILD FORESTS: CONSERVATION BIOLOGY AND PUBLIC POLICY (1994)).

391. *See* Clawson, *supra* note 367, at 305.

392. *See* Daniels, *supra* note 7, at 501-02.

393. *See* POWER, *supra* note 341, at 54; *see also* Gundars Rudzitis, *Nonmetropolitan Geography: Migration, Sense of Place, and the American West*, 14 URB. GEOGRAPHY 574 (1993).

394. *See generally* THE BIOPHILIA HYPOTHESIS (Stephen R. Kellert & Edward O. Wilson eds., 1993).

cal and biological benefits.[395]

3. *Assumption #3: Some Are More Equal than Others: Commodity Use as the Preferred Multiple Use*

To the BLM and Forest Service (as well as natural resource extraction industries), the term "multiple use" has traditionally meant that commodity production is usually the central management goal.[396] The BLM has sometimes been called the "Bureau of Livestock and Mining" because of its penchant for favoring these resource industries,[397] while National Forest managers have historically assumed that timber harvesting is the highest and best use of Forest Service lands.[398] The reasons favoring commodity use of public lands lie in statutory ambiguity, politics, and economic pressure.

One can begin with the language of the multiple use statutes. These laws provide federal land managers with no explicit standards on how the multiple use idea should be implemented. Compounding this, judicial review of agency decisions involving multiple use has been exceptionally narrow and deferential.[399] With no guidance from Congress or the courts, land managers have exercised their discretion in ways that, in the past, facilitated commodity uses of public lands. One multiple use implementation policy favoring natural resources industries was the adoption of a multiplicity-by-adjacency approach. This permitted a clear-cut in one parcel, a mining operation in a neighboring parcel, a dam and reservoir in the next parcel, and so on. The implementation of adjacent, independent multiple uses has come to mean "a carte blanche invitation to reduce anything of value

---

395. *See* PAUL EHRLICH & ANNE EHRLICH, EXTINCTION: THE CAUSES AND CONSEQUENCES OF THE DISAPPEARANCE OF SPECIES 77-100 (1981).

396. *See, e.g.*, COGGINS & GLICKSMAN, *supra* note 2, § 16.01[1]; Constance E. Brooks, *Multiple Use Versus Dominant Use: Can Federal Land Use Planning Fulfill the Principles of Multiple Use for Mineral Development?*, 33 ROCKY MTN. MIN. L. INST. 1-1 (1987).

397. *See generally* WILLIAM VOIGT, PUBLIC GRAZING LANDS: USE AND MISUSE BY INDUSTRY AND GOVERNMENT (1976); PHILLIP O. FOSS, POLITICS AND GRASS: THE ADMINISTRATION OF GRAZING ON THE PUBLIC DOMAIN (1960).

398. *See, e.g.*, Sierra Club v. Lyng, 694 F. Supp. 1260, 1268 (E.D. Tex. 1988) (noting "the high level of influence the timber companies have over policies and practices of the Forest Service"), *aff'd in part sub nom.* Sierra Club v. Yeutter, 926 F.2d 429 (5th Cir. 1991); FEDERAL PUBLIC LAND AND RESOURCES LAW, *supra* note 155, at 662.

399. *See, e.g.*, Perkins v. Bergland, 608 F.2d 803, 806 (9th Cir. 1979); Sierra Club v. Marita, 845 F. Supp. 1317, 1328 (E.D. Wis. 1994), *aff'd*, 46 F.3d 606 (7th Cir. 1995).

on public lands to private position and benefit."[400]

The past influence exerted by natural resources industries on federal land managers has been so great that some commentators have argued that "commodity users have overriden the good intentions and the discretionary language of the [MUSY, NFMA, and FLPMA],"[401] and "federal agencies frequently capitulate to [local commodity interest groups] . . . ."[402] This "capture" of multiple use agencies is due in part to the broad authority afforded public lands managers, the courts' refusal to overturn exercises of agency discretion that make commodity use a preferred multiple use, and relentless pressure by mining, timber, and stockman's interests.[403] Had no countervailing demand for multiple use lands ever been exerted by recreation and preservation interests, it is likely that these lands would have remained under the influence of private forces urging the economic development and extraction of resources.

Another factor contributing to the tendency of federal land agencies to favor resource extraction activities has been the presence of laws that subsidize ranchers, miners, and timber companies.[404] The General Accounting Office ("GAO") has estimated that grazing fees do not come close to covering the federal government's management and grazing land improvement costs,[405] that below-cost timber sales annually cost the Forest Service between $35 million and $112 million,[406] and that the government's economic return for issuing mineral patents worth up to $48 million to private parties is only between .01% and .03% of the land's value.[407] Although these GAO figures suggest that true multiple use has only rhetorical force, the reality is that ambiguous existing law and an exercise of broad discretion by federal land managers have combined to produce a form of subsidized corporate natural resources welfare.[408]

400. *Cong. Res. Serv.*, *supra* note 337, at 12-13 (comments prepared by R.W. Behan, School of Forestry, Northern Ariz. Univ.).

401. Houck, *supra* note 287, at 882-83.

402. Blumm, *supra* note 7, at 407.

403. *See id.*; *see also* COGGINS & GLICKSMAN, *supra* note 2, § 16.02[2][b].

404. *See* WILKINSON, *supra* note 2, at 3-27.

405. NATURAL RESOURCES MANAGEMENT ISSUES, *supra* note 4, at 19-20; *see also* COGGINS & GLICKSMAN, *supra* note 2, § 19.02[2].

406. NATURAL RESOURCES MANAGEMENT ISSUES, *supra* note 4, at 20.

407. *Id.* at 14.

408. *See* RUDZITIS, *supra* note 6, at 173-74; Blumm, *supra* note 7, at 408-11.

a. Reality: Recreation and Preservation Have Become the Preferred Uses of Public Lands, Not Commodity Development

Dubious premises underlie public subsidies that encourage resource extractive activities, as well as federal land managers' traditional preference for commodity uses of multiple use lands. One such assumption is the economic base model, which argues that job location is dictated by facts of economic geography, such as the location of exploitable natural resources.[409] The BLM and Forest Service rely on this model when they assume that commodity uses of public lands will preserve community stability by providing local employment.[410] An alternative to the economic base model, an "environmental" view of the economy, suggests that environmental quality serves as a more powerful engine for local economic vitality.[411] Another flawed assumption driving the notion that resource extraction is a preferred multiple use has been the belief that the public would remain content with public lands being utilized chiefly for commodity development. As this century comes to a close, the reality is quite the contrary. Citizen pressures for noncommodity uses have created a demand for more recreation and nonuse values, catching multiple use agencies off guard. Providing more hiking, backpacking, preservation, and habitat protection conflicts with sustaining previous levels of resource extraction.[412]

Although commodity development of public lands dominated during most of this century, a sweeping transformation has occurred in the past twenty years. As pointed out in Part I, resource extraction is declining as a use, while recreation and preservation are increasing. This change has paralleled, and is in many ways a result of, an American economy that has become less connected with manufacturing (especially primary processing of raw materials), and more dependent on information, technology, and service sectors.[413] Not only are these industries less reliant on commodity resources found on public lands, their workers desire the amenity and environmental values that are associated with recreation and wilderness.

409. *See* POWER, *supra* note 341, at 51.
410. *See* Nolen, *supra* note 31, at 837.
411. *See* POWER, *supra* note 341, at 52.
412. *See Cong. Res. Serv., supra* note 337; *see also* RUDZITIS, *supra* note 6, at 9.
413. *See generally Cong. Res. Serv., supra* note 337, at 51-57 (comments prepared by Matthew S. Carroll, Wash. State Univ., and Steven E. Daniels, Or. State Univ.).

4. Assumption #4: Conflicts Over Land Uses Arise Primarily Between Commodity Interests and Environmentalists

Although managers of BLM and Forest Service lands wish to avoid conflicts among competing users of their lands, they are certainly aware that disputes are inevitable. Over the past twenty to thirty years, the central controversy over use of the public lands has typically been between commodity interests wishing to use or extract resources from public lands and environmental organizations wishing to block those uses. To the extent that these conflicts have had to be judicially resolved, they almost always feature an environmental group bringing a lawsuit against a federal agency that was contemplating, or had approved, commodity development of public lands. The plaintiffs in these actions often rely on specific environmental statutes, such as the Endangered Species Act, Clean Water Act, NEPA, or the Wilderness Act, to challenge, delay, and defeat commodity development.[414]

The prevalence of these kinds of commodity versus environment conflicts has led public land managers to make two assumptions. First, federal managers must be extremely sensitive to environmental statutes when they permit commodity development, or they may be sued by environmental organizations. Second, their most ubiquitous dispute-resolution role will inevitably entail the need to referee controversies between the traditional adversaries— those that wish to harvest timber, drill for oil and gas, develop hard-rock mines, and graze cattle— pitted against individuals and groups wishing to prevent consumptive use and preserve environmental quality.[415]

a. Reality: Future Land Use Conflicts Will be Between Recreational and Preservationist Interests

As noted in Part I.B., consumptive use of public lands is falling. While timber, mining, oil and gas, and grazing operations will continue on federal lands, their dwindling impact should elicit less interest from both public land managers and environ-

414. *See* discussion *supra* Parts II.A.3., B.3., C.4.

415. *See, e.g.*, Jan G. Laitos, *Paralysis by Analysis in the Forest Service Oil and Gas Leasing Program*, 26 LAND & WATER L. REV. 105 (1991); Bruce Finley, *High-Tech vs. High Altitude: Man and Machines Imperil Timberline*, DENVER POST, Feb. 28, 1999, at B1 (noting that the proliferation of high-tech machines— from snowmobiles to cellular phones— has increased the recreational use of lands that were considered inaccessible. "Motorization of the mountains now is transforming the nature and the feel of western Colorado.")

mental organizations. Multiple-use agencies, as well as the environmental proponents that have traditionally sued them, should find their attention being drawn to a different kind of controversy. Future public lands battles are likely to be a consequence of the emerging dominant use reality of recreation and preservation uses. Advocates for each are now discovering that these two nonconsumptive uses are in fact largely incompatible. These interests formerly were allies in the fight against commodity users. When asked to referee and resolve this conflict, the two major multiple-use agencies, BLM and the Forest Service, will have little experience, and even less statutory guidance.

Recreation and preservation intersect at several points along the spectrum of public land uses. By far the most disturbing is when outdoor recreation disrupts wildlife. Studies have suggested that recreational activities, such as skiing, mountain biking, off-road vehicle use, and even hiking, contribute more to species endangerment and habitat destruction than resource extractive activities.[416] This concern about recreational impacts on wildlife becomes evident when ski resorts seek to expand their boundaries within Forest Service lands. For example, after the Colorado ski resorts of Vail and Loveland proposed an expansion of their skiing areas, opposition to these proposals came mainly from the state wildlife division, which feared the changes would be detrimental to prime lynx and wolverine habitat.[417] Apart from wildlife issues, the Forest Service has also become alarmed at the growing number of whitewater rafters and rock climbers in national forests. As a result, it has called for dramatic cuts in river tourism and outfitters on certain rivers,[418] as well as a ban on fixed anchors for climbers in certain wilderness areas.[419] When federal agencies fail to rein in use of motorized recreational vehicles, they may be subject to litigation initiated by preservationist organizations.[420]

---

416. *See generally* United States v. Town of Plymouth, 6 F. Supp. 2d 81, 91 (D. Mass. 1998) (holding Fish and Wildlife Service entitled to preliminary injunction banning off-road vehicles from beach to protect endangered species); Elizabeth Losos et al., *Taxpayer-Subsidized Resource Extraction Harms Species*, 45 BIOSCIENCE 446 (1995).

417. *See* Steve Lipsher, *Lift's Impacts Span Land Bridge*, DENVER POST, July 20, 1998, at 5B; Jason Blevins, *Vail Locals Rip Curbs on Access: Backcountry Ski Terrain Also Prime Lynx Habitat*, DENVER POST, July 15, 1998, at 4B.

418. *See* Gregg Zoroya, *Another Whitewater Ruckus*, USA TODAY, July 24, 1998, at D1.

419. *See Rules Changing at Cloud Peak*, DENVER POST, Aug. 9, 1998, at 38A.

420. *See, e.g.*, Southern Utah Wilderness Alliance v. Dabney, 7 F. Supp. 2d 1205 (D. Utah 1998) (considering a challenge to National Park Service decisions to permit off-road motorized vehicles in national parks); Montana Wilderness Assoc. v. United

Future conflicts about nonconsumptive uses of public lands will not be limited to the recreation versus preservation issue. Within the class of recreational users, there is a sharp division between recreation that is soft-impact (non-motorized) and hard-impact (motorized). Off-road vehicles, snowmobiles, jet skis, and tour planes are increasingly being challenged by non-motorized recreational users— hikers, swimmers, cross country skiers, and tourists using horses and llamas. The focal point of this challenge is often a federal lands agency that must choose, with virtually no statutory guidance other than a vague multiple-use standard, between these incompatible recreational uses of public lands.[421] These agencies must also decide when the lands under their jurisdiction have exceeded their carrying capacity— when the influx of visitors and competition among concessionaires and outfitters endangers both the visitor experience and the ecological health of the area.

5. *Assumption #5: Ecosystem Management Can Supplement Multiple Use as a Land Management Philosophy*

The chief multiple-use statutes, MUSY, NFMA, and FLPMA, do not expressly mandate that the Forest Service or BLM consider, or manage, their lands in accordance with ecosystem management principles. Nevertheless, one can argue that ecosystem management is not inconsistent with multiple use and indeed may already be encompassed within relevant statutory law.[422] Ecosystem management does not necessarily alter federal land management agencies' legislative mandates because coordinating human activities across large geographic areas to maintain or restore ecosystems could ensure the long-term use of

---

States Forest Service, No. CV96-152-M-DWM (D. Mont. Feb. 13, 1998) (order granting in part and denying in part motions to dismiss) (challenging Forest Service's decision to facilitate increased recreational use of motorized vehicles in wilderness study area).

421. *See generally* Nancy Lofholm, *Forest Users Face New Rules*, DENVER POST, Dec. 8, 1998, at B5 (noting that the Gunnison National Forest has implemented new rules that restrict certain types of motorized recreation where it was previously allowed); *Off-Roaders Faced With Limitations*, DENVER POST, July 26, 1998, at C2 (noting that the conflict between "anti-machine activists" and off-highway vehicles and personal watercraft will be "a fight to the death"); Erin Kelly, *A Noisy Debate on National Parks*, DENVER POST, June 7, 1998, at 12A; Berny Morson, *Trouble in the Forest*, ROCKY MOUNTAIN NEWS, Dec. 7, 1997, at 68A (noting the "testiness among groups who use public lands" and quoting from a 34-year Forest Service veteran, "[P]eople on cross-country skis and on snowmobiles can't seem to get along.").

422. *See, e.g.*, Keiter, *supra* note 308; Robert B. Keiter, *NEPA and the Emerging Concept of Ecosystem Management on the Public Lands*, 25 LAND & WATER L. REV. 43 (1990).

natural resources, including the production of commodity resources.[423] Also, to the extent that FLPMA and NFMA emphasize resource relationships, ecosystem management would support the multiple-use concept since it assumes interagency coordination and collaboration among federal and nonfederal parties within most ecosystems.[424]

As a result of scientific and academic support for ecosystem management,[425] as well as its seemingly close linkage to existing multiple-use concepts, virtually all federal land agencies are exploring how to integrate it into their management decisions.[426] Each major land and natural resource management agency— the BLM, Forest Service, Park Service, and Fish and Wildlife Service— has begun to implement an ecosystem approach to managing its lands.[427] In the case of the BLM and the Forest Service, however, the still-applicable statutory multiple-use mandates found in MUSY and FLPMA continue to encourage production of commodity resources, such as timber, grass, and minerals.[428] Absent explicit congressional adoption of ecosystem management, it is unlikely that multiple-use agencies traditionally tied to the extraction and development of natural resources will pursue, with any vigor, current ecosystem initiatives.[429]

One component of ecosystem management, biodiversity, has yet to be formally adopted and implemented by multiple-use agencies as a planning and management standard.[430] This failure is not surprising because multiple-use laws were not de-

---

423. *See* U.S. GENERAL ACCOUNTING OFFICE, ECOSYSTEM MANAGEMENT: ADDITIONAL ACTIONS NEEDED TO ADEQUATELY TEST A PROMISING APPROACH 4 (1994) [hereinafter ECOSYSTEM MANAGEMENT REPORT].

424. *See id.*; *see also* COGGINS & GLICKSMAN, *supra* note 2, § 16.01[2][b]; Coggins, *supra* note 308, at 36.

425. *See* discussion *supra* Part II.C.2.

426. *See* Harry N. Scheiber, *From Science to Law to Politics: An Historical View of the Ecosystem Idea and Its Effect on Resource Management*, 24 ECOLOGY L.Q. 631 (1997).

427. *See* ECOSYSTEM MANAGEMENT REPORT, *supra* note 423, at 4-5; Haeuber, *supra* note 308, at 2.

428. *See* Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. § 528 (1994); Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1702(c), 1712(c)(1), 1732(a) (1994).

429. *See, e.g.*, Houck, *supra* note 287, at 927 ("Turning to ecosystem planning, the [Forest] Service is quite up front about its responsibilities: it has none.") and 945 (commenting that BLM rangeland standards used in Colo. establish "local goals" in adopting an ecosystem approach that are "compromised" and "contain . . . ambiguity"); Keiter, *supra* note 308, at 318-19.

430. *See, e.g.*, Houck, *supra* note 287, at 925 ("[T]he [Forest] Service found that diversity was neither the 'controlling principle in forest planning,' nor even a 'concrete standard.' The controlling principle was 'multiple use objectives.'").

signed to protect biological diversity.[431] While other federal statutes, such as the Endangered Species Act, Clean Water Act, and the Wilderness Act, can be construed as mandating protection of species, habitats, and ecosystems,[432] they do not form a coherent comprehensive framework for managing biodiversity on public lands.[433]

a. Reality: It May Be Quite Difficult (or Impossible) for Ecosystem Management, Alone, to Become a Viable Public Lands Policy

Although many agencies are considering the adoption of ecosystem management, or have already drafted guidance regarding its adoption, the promise of ecosystem management as a long-term public land management strategy is problematic. Ecosystem management suffers from inherent difficulties that limit its effectiveness, especially if it is to become the sole management philosophy for public lands. These difficulties have caused the record of ecosystem management to be a mixed one in the courts, in Congress, and on the public lands.[434]

- *Definitional Ambiguity*: "Ecosystem management" suffers from the absence of a generally accepted definition.[435] As a result, the nature of ecosystems, as well as their management, often become whatever policymakers want them to be.[436] It is common for federal agencies to use many different definitions of ecosystem management.[437]
- *The Biocentric-Anthropocentric Dilemma*: Ecosystem management seeks to integrate the needs of humans and ecosystems. Unfortunately, those charged with

431. *See generally* OFFICE OF TECHNOLOGY ASSESSMENT TASK FORCE, TECHNOLOGIES TO MAINTAIN BIOLOGICAL DIVERSITY 221 (1988).

432. *See generally* Heidi J. McIntosh, *National Forest Management: A New Approach Based on Biodiversity*, 16 J. ENERGY, NAT. RESOURCES & ENVTL. L. 257 (1996); J.B. Ruhl, *Biodiversity Conservation and the Ever-Expanding Web of Federal Laws Regulating Nonfederal Lands: Time for Something Completely Different?*, 66 UNIV. COLO. L. REV. 555, 579-616 (1995).

433. *See generally* Julie B. Bloch, *Preserving Biological Diversity in the United States: The Case for Moving to an Ecosystems Approach to Protect the Nation's Biological Wealth*, 10 PACE ENVTL. L. REV. 175, 198-204 (1992).

434. *See generally* Haeuber, supra note 308.

435. *See* Coggins, *supra* note 308, at 36 ("No amount of semantic refining can change the fact that 'ecosystem management' will always be an arbitrary, artificial, and amorphous concept.").

436. *See* Houck, *supra* note 287, at 877 (commenting that "ecosystem management" is like the term "multiple use," in that both allow for largely "standardless, subjective" policy decisions).

437. *See* Haeuber, *supra* note 308, at 6, 25-28.

implementing this management philosophy too often must choose between protecting the integrity of native ecosystems from humans and ensuring that humans and their needs get first priority. The former, which advocates a natural approach, is the biocentric model. The latter, which assumes that human activity is inevitable and must be an essential part of management decisions about resources, is the anthropocentric approach.[438] Advocates of ecosystem management profess that humans and nature are interconnected and that a choice does not have to be made between one or the other.[439] In truth, not all species are equal in an ecosystem. Indeed, the human species, particularly when it engages in commodity development or recreation, often dominates the land.[440]

- *Delineating Ecosystem Boundaries*: Biodiversity and ecosystem planning require large, preferably undisturbed, tracts of land.[441] In determining the appropriate geographic scale, decisions must be made regarding the relevant boundary for the ecosystem. Is a watershed the best ecosystem unit,[442] or a biome?[443] Ecosystems are interlinked and overlapping and are defined by nature, which means they are not easily segregated into tracts of land like those historically managed by federal multiple-use agencies.[444]
- *Insufficient Data*: Federal agencies do not have adequate data to support full-scale ecosystem management. To understand the dynamics and characteristics of an ecosystem, one must collect and analyze large volumes of scientific data from several different disciplines. Socioeconomic data must also be gathered in order to identify relationships between humans and ecological conditions. Such collection and evaluation efforts are expensive and time-consuming.[445] Moreo-

438. *See* Oliver A. Houck, *Are Humans Part of Ecosystems?*, 28 ENVTL. L. 1 (1998); *see also* Thomas R. Stanley, Jr., *Ecosystem Management and the Arrogance of Humanism*, 9 CONSERVATION BIOLOGY 255, 256 (1995).

439. *See* Keiter, *supra* note 308, at 300, 302-03.

440. *See* RUDZITIS, *supra* note 6, at 37-8, 44.

441. *See* Houck, *supra* note 287, at 880.

442. *See* FISH AND WILDLIFE SERVICE, U.S. DEP'T OF THE INTERIOR, ECOSYSTEM APPROACH IMPLEMENTATION ACTIONS 8 (Feb. 24, 1994) (internal memorandum to all service employees from the Director of U.S. Fish and Wildlife Service) (on file with author).

443. A community of living organisms of a single major ecological region.

444. *See* Rebecca Thomson, *Ecosystem Management: Great Idea, But What Is It, Will It Work, and Who Will Pay?*, NAT. RESOURCES & ENV'T, Winter 1995, at 70-71.

445. *See, e.g.*, ECOSYSTEM MANAGEMENT REPORT, *supra* note 423, at 7 (discussing

ver, even with adequate data, uncertainty regarding how ecosystems function, creates strong differences of opinion in the interpretation of scientific and socioeconomic evidence.

- *Coordination Problems*: In order for classic ecosystem management to occur, the relevant ecosystem must be defined by nature, not by artificial jurisdictional boundaries set by management agencies and private parties. This means that there must be coordination among all interested parties— federal, state, and private. Coordination between federal agencies within an ecosystem is made more difficult by their disparate missions and separate planning requirements.[446] Collaboration and consensus-building with state and local governments, as well as with private landholders, is likely to be equally demanding.[447]

The problems associated with ecosystem management have prevented this management philosophy from succeeding in many individual cases.[448] Moreover, neither ecosystem management nor one of its primary components, biodiversity, have fared particularly well in court, especially when proponents have argued that these management standards must be employed by multiple-use agencies.[449] Additionally, Congress has not been receptive to ecosystem management.[450]

B. A New Land Management Philosophy Is Needed

Recently, federal lands agencies seem to have employed a land management strategy that is an uneasy hybrid of multiple use and ecosystem management. Despite this practice, dominant use, not multiple use, is the reality. Nor has ecosystem

---

barriers impeding administration's initiatives to implement ecosystem management); Thomson, *supra* note 444, at 71.

446. *See* ECOSYSTEM MANAGEMENT REPORT, *supra* note 423, at 7.

447. *See id.* at 7-8; *see also* Haeuber, *supra* note 308, at 7; Thomson, *supra* note 444, at 71.

448. *See* Haeuber, *supra* note 308, at 17.

449. *See, e.g.*, Sierra Club v. Marita, 845 F. Supp. 1317 (E.D. Wis. 1994), *aff'd*, 46 F.3d 606 (7th Cir. 1995); Krichbaum v. Kelley, 844 F. Supp. 1107 (W.D. Va. 1994), *aff'd*, 61 F.3d 900 (4th Cir. 1995); Sierra Club v. Robertson, 845 F. Supp. 485 (S.D. Ohio 1994), *rev'd sub nom.* Sierra Club v. Thomas, 105 F.3d 248 (6th Cir. 1997), *vacated sub nom.* Ohio Forestry Ass'n, Inc. v. Sierra Club, 523 U.S. 726 (1998); Sierra Club v. Robertson, 784 F. Supp. 593 (W.D. Ark. 1992), *aff'd*, 28 F.3d 753 (8th Cir. 1994); *cf.* Seattle Audubon Soc'y v. Lyons, 871 F. Supp. 1291, 1311 (W.D. Wash. 1994), *aff'd sub nom.* Seattle Audubon Soc'y v. Moseley, 80 F.3d 1401 (9th Cir. 1996).

450. *See generally* Haueber, *supra* note 308, at 17-19; Keiter, *supra* note 308, at 327-28.

health resulted, particularly where mechanized recreation assaults deserts and forests. To compound matters, statutorily-recognized extractive uses are in decline, even though commodity resources from public lands should play an important role in this nation's economy. Because the country's current public land management template seems to be yielding unfortunate and unplanned side effects, a new public-lands philosophy is needed.

A next-generation public lands management philosophy must reflect certain realities. Primitive outdoor recreation and preservation of large segments of the public land base as wilderness, undisturbed ecosystems, or wildlife habitat, will likely continue to be the most popular uses of public lands, including those of the BLM and Forest Service.[451] It must be understood, however, that recreation, even nonmotorized recreation, is often inconsistent with preservationist values.[452] Recreation and preservation also foreclose commodity development of public lands, even though there are advantages to securing essential commodity resources from federal lands.[453] A new management philosophy must therefore reckon with the inevitability of some human interaction with public lands.[454] This human intervention will surely entail both noncommodity recreational use, some level of commodity development, and some incursions by recreationalists in preservation areas. Any proposed management strategy must accommodate these tensions. While multiple use and ecosystem management have certain attributes that should be retained by a new philosophy, their many internal limitations preclude a correct mix of uses.

IV

ECONOMIC EFFICIENCY AS A BASIS FOR PUBLIC LAND MANAGEMENT

The public lands contain a vast amount of resources that have the potential to produce a diverse mix of outputs. These include timber, cattle, extracted hardrock minerals, oil, gas, coal,

451. *See, e.g.*, Hardt, *supra* note 7, at 387.

452. *See* Jim Hughes, *Loving It To Death: Recreation Has Taken a Toll on the Wilderness and Park Lands Surrounding Moab*, DENVER POST EMPIRE MAGAZINE, Sept. 7, 1997, at 13 (noting how recreation has largely replaced mining and ranching in the West, but at a severe cost to natural ecosystems).

453. *See* Hardt, *supra* note 7, at 387-89. One advantage is that the extraction of more domestic resources will reduce this country's reliance on imported natural resources.

454. *See* Jonathan Baert Wiener, *Law and the New Ecology: Evolution, Categories, and Consequences*, 22 ECOLOGY L.Q. 325, 340-56 (1995) (reviewing JONATHAN WEINER, THE BEAK OF THE FINCH: A STORY OF EVOLUTION IN OUR TIME (1994)); *see also* R. Edward Grumbine, *What Is Ecosystem Management?*, 8 CONSERVATION BIOLOGY 27, 31 (1994).

recreation, and preserved habitat for species, ecosystems, or unique geological structures. A given acre of land may be able to produce multiple commodity products. Under most circumstances, however, the two dominant uses of recreation and preservation are not compatible with the traditional commodity outputs.[455] Timber clearcutting detracts from the aesthetic benefits to the recreational hiker and reduces the habitat of certain wildlife species like the spotted owl. Abandoned mine sites leach heavy metals into nearby streams and threaten the health of humans and fish populations. The designation of new wilderness areas and national parks serves to reduce the available land base for mineral exploration and cattle grazing.

In light of the two uses that now predominate on public lands, as well as the failure of existing policy to rationally accommodate those uses with consumptive uses, two questions arise: (1) How much of the 650 million acres of federal land should be devoted to the production of commodity goods (timber, grazing, minerals), how much should be allocated to recreation, and how much to preservation uses? (2) How should public land managers make those allocations?

A. Economic Efficiency on Public Lands

Economic principles suggest allocating land to obtain the goal of efficiency. An efficient allocation means that the current use of resources maximizes the total value of goods and services for a given distribution of income. Mindful of the underlying assumptions,[456] economic efficiency can be used as a theoretical ideal for allocating resources in a society. This theoretical goal could serve as the benchmark for policymakers and agencies allocating resources on the public lands.[457]

---

455. *See generally* POWER, *supra* note 6, at 1-2; Clawson, *supra* note 367, at 286-87. Some types of recreation, however, may be compatible with extractive uses. Timber cuts create open areas that attract wildlife and thereby benefit hunters. Building roads in a forest for timber also increases access for recreational hikers.

456. Economic efficiency embodies a number of important assumptions, including the following: (1) Economic value reflects the full social benefits and costs of all resources; (2) The benefits and costs over different time periods must be adjusted by the appropriate discount rate; (3) Economic value is ultimately derived from human preferences, a philosophical assumption that is both utilitarian and anthropocentric; (4) All economic valuations reflect the given distribution of income. Changes in the initial distribution of income would lead to different valuations of resources.

457. *See, e.g.*, TALBOT PAGE, CONSERVATION AND ECONOMIC EFFICIENCY: AN APPROACH TO MATERIALS POLICY (1977). Efficiency has also been invoked by both the proponents and opponents of privatizing federal lands. Privatization advocates argue that government inherently leads to an inefficient allocation of resources because government bureaucrats seek to build empires and power rather than pursue the social welfare,

Recent contributions in the economics literature provide an appropriate theoretical framework to determine the optimal allocation of land.[458] To demonstrate the operation of an efficiency methodology, one can begin with the overly simple assumption that the public land base is allocated between just two categories of uses: (1) extractive uses that include timber harvesting, grazing, and mining; and (2) nonextractive uses that include recreation and preservation.[459] An efficient allocation maximizes net social benefits from the set of possible land allocations subject to the constraint of the fixed federal land base. The efficiency solution requires that the marginal unit of land yield a marginal benefit of recreation and preservation equal to the marginal benefit of commodity use. Intuitively, this means that the last acre of land allocated to timber production, cattle grazing, or mining should generate the same incremental benefits as the last acre of land allocated to hiking, camping, mountain biking, or wildlife habitat preservation.

The optimal allocation of land can be represented by a graph of the supply and demand of land allocated to recreation and preservation. In Figure 4, the marginal benefit (MB) curve reflects the incremental value society places on land devoted to recreation and preservation uses and represents the demand curve (D) for recreation and preservation land.[460] The marginal cost (MC) of expanding the land base for recreation and preser-

---

rent-seeking special interests capture the government decision makers, and politicians remain subservient to a rationally ignorant populace. *See, e.g.*, TERRY L. ANDERSON & DONALD R. LEAL, FREE MARKET ENVIRONMENTALISM (1991); RICHARD L. STROUP & JOHN A. BADEN, NATURAL RESOURCES: BUREAUCRATIC MYTHS AND ENVIRONMENTAL MANAGEMENT (1983). Defenders of public ownership argue that subjecting these lands to the private market would lead to economic inefficiency because of widespread market failures associated with federal land use, including public goods, externalities, and common property resources. *See, e.g.*, John V. Krutilla & John A. Haigh, *An Integrated Approach to National Forest Management*, 8 ENVTL. L. 373, 377-81 (1978).

458. *See, e.g.*, Rigoberto A. Lopez et al., *Amenity Benefits and the Optimal Allocation of Land*, 70 LAND ECON. 53 (1994); Edward B. Barbier & Joanne C. Burgess, *The Economics of Tropical Forest Land Use Options*, 73 LAND ECON. 174 (1997).

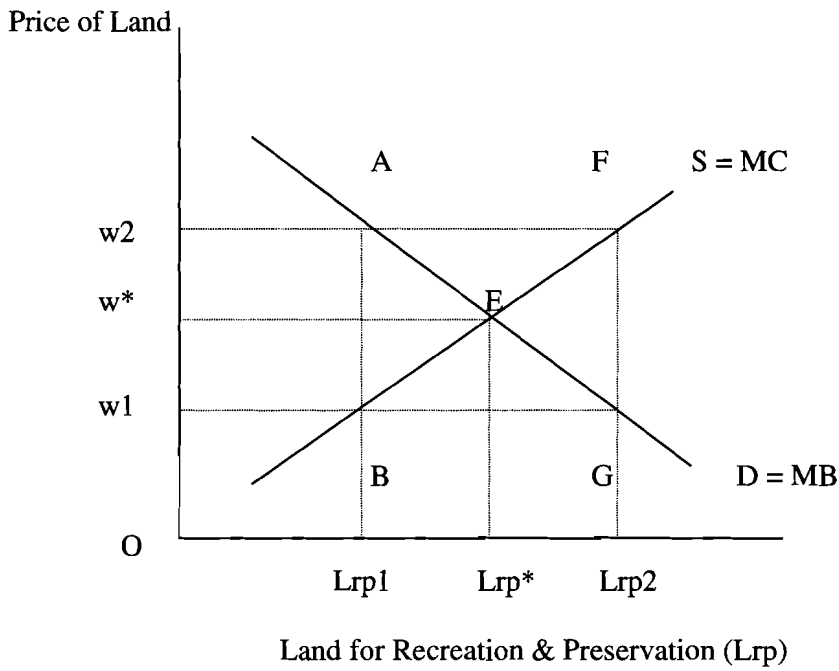
459. Framing the land management problem in terms of land allocation simplifies the problem to one variable, land. This approach is consistent with the Forest Service's current forest planning system, which has been analogized to a zoning ordinance that restrict uses in designated regions. *See* Michael J. Gippert & Vincent L. DeWitte, *The Nature of Land and Resource Management Planning Under the National Forest Management Act*, 3 ENVTL. LAW. 149, 157 (1996). In a broader and more realistic sense, there are many resources on the land, such as timber, minerals, water, soil quality, fish, and wildlife. The efficient management of resources like timber and minerals involves separate optimizing questions that will not be developed here.

460. The demand curve is downward sloping under the assumption of declining marginal benefits of recreation and preservation.

vation use is simply the foregone marginal benefit of land allocated to commodity use. For a fixed stock of public lands, setting the amount of land allocated to commodity use simultaneously determines the amount of land available for recreation and preservation. Thus, the marginal cost curve defines the supply curve (S) for land allocated to recreation and preservation. The equilibrium point (E) equates supply and demand and thereby determines the efficient level of land allocated for recreation and preservation (Lrp*) and the corresponding socially efficient price (w*).

Figure 4

The Optimal Allocation of Land for Recreation and Preservation Uses



The significance of these efficient land allocation conditions can be illustrated by examining two inefficient allocations of land. Suppose policy makers initially set the level of recreation and preservation land at Lrp^1 below the efficient level Lrp*. The level Lrp^1 is inefficient because the marginal benefit of land for recreation and preservation exceeds the marginal cost of land. Expanding the amount of land allocated to recreation and preservation from Lrp^1 to Lrp* increases net benefits to society equal to the area ABE in Figure 4.[461] On the other hand, setting recreation and preservation land above the efficient level Lrp* leads to an excessive amount of land allocated to recreation and preservation. At Lrp^2, the marginal benefit of land allocated to recreation and preservation would be less than the marginal cost of land. Reducing recreation and preservation land from Lrp^2 to Lrp* generates net benefits for society equal to the area EFG as shown in Figure 4.[462] Thus, any re-allocation of land for recreation and preservation uses below or greater than Lrp* leads to an inefficient outcome, while a movement to the efficient level increases net benefits for society.

B. Valuing the Benefits of Market and Non-Market Goods

The efficiency goal seeks to duplicate the result that would be reached if commodity and recreational and preservationist goods could be traded in a well-functioning market. In such a market, preferences will shift from less valued uses to more valued uses, measured by people's willingness to pay. When markets do not exist for various uses, welfare economics teaches us that it is possible to test whether a particular allocation has achieved efficiency by subjecting the allocation to an analysis of costs and benefits. Such an analysis would attempt to measure the social benefits of an allocation among commodity, recreation, and preservationist uses, as well as its costs.[463]

While the costs of a given allocation of land uses are signifi-

461. Moving from Lrp^1 to Lrp* increases total benefits by the area under the demand curve from Lrp^1 to Lrp* and raises total costs by the area under the supply curve from Lrp^1 to Lrp*. The increase in net benefits is simply the change in total benefits less the change in total costs, or ABE.

462. Moving from Lrp^2 to Lrp* reduces total benefits by $EGLrp^2Lrp^*$ (area under the demand curve from Lrp* to Lrp^2) and lowers total costs by $EFLrp^2Lrp^*$ (area under the supply curve from Lrp* to Lrp^2). The reduction in costs exceeds the reduction in benefits by the area of EFG.

463. *See, e.g.*, EDWARD J. MISHAN, COST-BENEFIT ANALYSIS (1976).

cant,[464] what is particularly important in allocating competing public land uses is the measurement of marginal benefits of recreation, preservation, and commodity uses. Unfortunately, it is exceptionally difficult to calculate the social benefits of land used for recreation and preservation purposes, because these uses have no easily discernible market value. The remainder of the article will therefore focus on offering both a methodology for valuing recreation and preservation and a general aggregate economic value for each.

The theoretical concept of economic efficiency assumes a full accounting of social benefits of all resources. Social benefits are valued by willingness to pay for a good, service, or resource. The social benefits from land allocated to commodity use yields tangible market goods, like lumber, cattle, metal, and energy products, whose economic value can be calculated. The social benefits of land allocated to recreation include non-market activities, such as hiking, camping, fishing, hunting, and birdwatching. These are not easily quantified. It is likewise difficult to put an economic value on land devoted to preservation. The natural ecosystem generates various services outside of the market that are important to humans, such as the collection and storage of drinking water in a watershed, genetic information leading to new medicinal and commercial products, and sequestration of greenhouses gases in a standing forest.[465]

Policymakers must recognize that the full economic value of public lands may extend beyond the traditional use values associated with commodities. The true value of these lands also includes nonconsumptive values, sometimes called passive use values, that may be employed to set the worth of recreation and preservation uses. Although passive use values are more speculative than use values, because they are not subject to normal market valuation methods, they are real and valid, since they reflect utility derived by humans from a resource.[466] Two generally recognized passive use values are "option value" and "existence value." Option value measures the amount an indi-

464. Costs are usually measured in terms of opportunity costs— the social value foregone when an allocation moves away from one use (commodities) to another (recreation).

465. *See generally* NORMAN MYERS, THE PRIMARY SOURCE: TROPICAL FORESTS AND OUR FUTURE 189-293 (1984).

466. *See* Ohio v. Dep't of the Interior, 880 F.2d 432, 464 (D.C. Cir. 1989) ("Option and existence values may represent 'passive' use, but they nonetheless reflect utility derived by humans from a resource, and thus, prima facie, ought to be included in a damage assessment.").

vidual is willing to pay to reserve the right to use the resource in the future.[467] Existence value defines the satisfaction an individual derives from knowing a resource continues to exist, even if that person never personally uses the resource and will not likely do so in the future.[468]

Although option and existence values are extremely difficult to measure, certain non-marketed resource methodologies are available. One that seems particularly applicable to recreational use of public lands is the travel cost method. This method measures recreation benefits indirectly by observing the costs individuals willingly incur to travel to a site, such as gasoline or opportunity costs of time. Such behavior implies that recreation benefits are at least as great as those travel costs.[469] Another methodology for determining option and existence values is the contingent valuation method. This method utilizes surveys to directly elicit an individual's willingness to pay for a hypothetical change in resource or environmental quality.[470] Sophisticated surveys typically ask respondents whether they would be willing to pay a specified amount of money through such mechanisms as higher taxes, user fees, or trust funds for improvement of environmental quality. Both the travel cost and contingent valuation methods can measure use values, such as recreation, but only contingent valuation can estimate nonuse values of natural resources, such as preservation.

The estimation of economic value for nonmarket natural resource use has gained acceptance among policymakers and the courts. The Comprehensive Environmental Response, Compen-

---

467. *See* Burton A. Weisbrod, *Collective-Consumption Services of Individual-Consumption Goods*, 78 Q.J. ECON. 471, 472 (1964).

468. *See generally* John V. Krutilla, *Conservation Reconsidered*, 57 AM. ECON. REV. 777, 781 (1967) ("There are many persons who obtain satisfaction from mere knowledge that part of wilderness North America remains even though they would be appalled by the prospect of being exposed to it.").

469. *See generally* A. MYRICK FREEMAN III, THE BENEFITS OF ENVIRONMENTAL IMPROVEMENT: THEORY AND PRACTICE 195-229 (1979); MARION CLAWSON & JACK L. KNETSCH, ECONOMICS OF OUTDOOR RECREATION (1966).

470. *See, e.g.*, W. Michael Hanemann, *Valuing the Environment Through Contingent Valuation*, J. ECON. PERSPECTIVES, Fall 1994, at 19 (1994); Robert K. Davis, *Recreation Planning as an Economic Problem*, 3 NAT. RESOURCES J. 239 (1963); *see also, e.g.*, DETERMINING THE VALUE OF NON-MARKETED GOODS: ECONOMICS, PSYCHOLOGICAL, AND POLICY RELEVANT ASPECTS OF CONTINGENT VALUATION METHODS (R.J. Kopp et al. eds., 1997); THE CONTINGENT VALUATION OF ENVIRONMENTAL RESOURCES: METHODOLOGICAL ISSUES AND RESEARCH NEEDS (David J. Bjornstad & James R. Kahn eds., 1996); ROBERT CAMERON MITCHELL & RICHARD T. CARSON, USING SURVEYS TO VALUE PUBLIC GOODS: THE CONTINGENT VALUATION METHOD (1989); Glenn Harrison & James C. Lesley, *Must Contingent Valuation Surveys Cost So Much?*, 31 J. ENVTL. ECON. & MGMT. 79 (1996).

sation and Liability Act of 1980 (CERCLA)[471] and the Oil Pollution Act of 1990 (OPA)[472] both impose liability on parties responsible for destroying natural resources. Natural resource damage assessment refers to the process of establishing values for different levels of natural resources lost due to environmental contamination. CERCLA and OPA authorize agency regulations that establish protocol methods for natural resource damage assessments[473] and entitle a plaintiff using such methods to a rebuttable presumption of accuracy.[474]

The most controversial features of the regulatory and judicial challenges to natural resource damage assessments concern the reliability of contingent valuation methodologies and the validity of passive use and non use values.[475] In the 1989 landmark case of *Ohio v. U.S. Dep't of Interior*,[476] the D.C. Court of Appeals instructed the Department of Interior to give equal weight to use and nonuse values in assessing natural resources damages.[477] The *Ohio* case upheld the contingent valuation as an acceptable method for calculating option and existence values and concluded that these two values could constitute acceptable passive use values.[478] In 1992, the National Oceanic and Atmospheric Administration (NOAA) organized a blue-ribbon panel of economists and sought recommendations relating to natural resource damage assessment regulations under OPA. After much debate, the NOAA panel concluded that contingent valuation studies "can produce estimates reliable enough to be the starting point of a judicial process of damage assessment, including lost passive-use values" provided that such studies follow the panel's recommended guidelines.[479] In a separate 1998 ruling on DOI

471. 42 U.S.C. §§ 9601-9675 (1994).

472. 33 U.S.C. §§ 2701-2761 (1994).

473. CERCLA, 42 U.S.C. § 9651(c)(2) (1994); OPA, 33 U.S.C. § 2706(e)(1) (1994).

474. CERCLA, 42 U.S.C. § 9607(f)(2)(C) (1994); OPA, 33 U.S.C. § 2706(e)(2) (1994).

475. *See generally* Brian R. Binger et al., *The Use of Contingent Valuation Methodology in Natural Resource Damage Assessments: Legal Fact and Economic Fiction*, 89 NW. U.L. REV. 1029 (1995); Peter A. Diamond & Jerry A. Hausman, *Contingent Valuation: Is Some Number Better than No Number?*, J. ECON. PERSPECTIVES, Fall 1994, at 45; Hanemann, *supra* note 470; Paul R. Portney, *The Contingent Valuation Debate: Why Economists Should Care*, J. ECON. PERSPECTIVES, Fall 1994, at 3.

476. 880 F.2d 432 (D.C. Cir. 1989).

477. *Id.* at 464.

478. *Id.* at 478 ("[T]he risk of overestimation has not been shown to produce such egregious results as to justify judicial overruling of DOI's careful estimate of the caliber and worth of CV methodology.").

479. Natural Resource Damage Assessments Under the Oil Pollution Act of 1990, 58 Fed. Reg. 4601, 4610 (1993). The panel guidelines for conducting CVM studies includes the use of personal interviews, use of a future-based willingness to pay measure rather than a willingness to accept measure, use of a referendum format

regulations for simplified natural resource damage assessments, the D.C. Court of Appeals upheld the use of older contingent valuation and travel cost studies in the formation of computer model parameters.[480]

Government agencies also have relied on the travel cost method and contingent valuation to estimate the value of recreation and nonmarket environmental resources.[481] The U.S. Water Resources Council has identified the travel cost method and contingent valuation as the two preferred methods for valuing outdoor recreation.[482] The U.S. Bureau of Reclamation and the National Park Service have used contingent valuation to estimate recreation benefits for fishing and rafting in the Grand Canyon under different scenarios of water releases from the Glen Canyon Dam.[483] Other state fish and wildlife agencies have also used these methods to value fish and wildlife-related recreation for the purpose of formulating policy.[484]

C. *Measuring the Benefits of Public Lands*

If policymakers adopt the principle of economic efficiency for managing multiple-use lands, an assessment of the relative benefits of alternative uses could lead to changes in the current management policies. In an effort to discern the possible implications of such a policy, this section develops rough estimates of the aggregate benefits from different uses of multiple-use lands. The following analysis generally relies on quantity data from the year 1995, when possible, and utilizes price variables that represent either the clearing price for market commodities or an imputed market clearing price for non-market commodities. This analysis relies on many simplifying assumptions and should be viewed as an exercise that explores possible implications of moving towards an efficiency criterion in public land management.

---

question, and certain reminders to respondents during the interviews. *Id.* at 4608-10.

480. *See* National Ass'n of Mfrs. v. Dep't of the Interior, 134 F.3d 1095, 1116 (D.C. Cir. 1998) ("We also find no error in DOI's decision to use older studies that rely on contingent valuation or travel cost methodologies.").

481. *See* JOHN B. LOOMIS, INTEGRATED PUBLIC LANDS MANAGEMENT 168 (1993).

482. *See id.*

483. *See id.*

484. *See id.*

1. *Recreation Benefits*

The Forest Service conducts extensive economic assessments of the benefits of different uses (timber, range, minerals, recreation, and wildlife) on national forest system lands under the Resource Planning Act (RPA) program.[485] To estimate recreation benefits, the Forest Service has relied on studies utilizing the travel cost method and contingent valuation.[486] These Forest Service recreation prices are used to derive updated estimates of the benefits of recreation for both the national forest system and BLM lands, based on recreation visitor-day numbers at these locations.

Estimates of recreation benefits in the national forest system and BLM lands were derived in the following manner. The quantity of 1995 recreational visitor days for each recreation category was multiplied by the corresponding value of a recreation visitor day.[487] These recreation unit values represent the imputed market clearing price as estimated by the Forest Service and adjusted into real 1995 dollars. The benefits of recreation on BLM lands were derived by multiplying BLM visitor-day quantities times the corresponding Forest Service price for recreation. To the extent that Forest Service prices overestimate recreation on BLM lands, the resulting figures would similarly overstate recreation benefits.

In 1995, the total benefits from recreation in the national forest system equaled $8.288 billion, and the corresponding recreation benefits on BLM lands were $1.520 billion. Table 1 lists the recreation prices, visitor days, and benefits for the major common recreation activities on Forest Service and BLM lands.

---

485. *See generally* FOREST SERVICE, DEP'T OF AGRIC., THE FOREST SERVICE PROGRAM FOR FOREST AND RANGELAND RESOURCES: A LONG-TERM STRATEGIC PLAN, ch. 6 & app. B (1990); FOREST SERVICE, DEP'T OF AGRIC., DRAFT RESOURCE PLANNING ASSESSMENT PROGRAM, ch. 4 & app. E (1995) (Mar. 29, 1999) <http://www.fs.fed.us/pl/rpa/95rpa/tocmain.htm>.

486. *See generally* RICHARD G. WALSH ET AL., REVIEW OF OUTDOOR RECREATION ECONOMIC DEMAND STUDIES WITH NONMARKET BENEFIT ESTIMATES, 1968-1988 (1988).

487. The Forest Service collects data on 9 different categories of recreation: 1) mechanized travel and viewing scenery; 2) camping, picnicking, and swimming; 3) hiking, horseback riding, and water travel; 4) winter sports; 5) hunting; 6) resorts, cabins, and organization camps; 7) fishing; 8) nature studies; and 9) "other", which includes team sports, gathering forest products, attending talks and programs. *See* AGRICULTURAL STATISTICS (1997), *supra* note 41, at XII-30. BLM identifies 12 different types of recreational uses of public lands: 1) camping; 2) fishing, 3) hunting, 4) miscellaneous land-based activities, 5) miscellaneous water-based activities, 6) motorized boating, 7) off-highway vehicle travel, 8) motorized winter sports, 9) non-motorized boating, 10) non-motorized travel, 11) non-motorized winter sports, and 12) driving for pleasure. *See* PUBLIC LAND STATISTICS 1994/1995, *supra* note 1, at 243 (1996).

The leading activities on Forest Service lands are mechanized travel and viewing scenery, fishing, camping, and picnicking, while the three predominant recreational activities on BLM lands are nonmotorized travel, camping, and hunting.

Table 1[488]
Recreation Benefits in the National Forest System and BLM Lands

Recreation Activity	Price of a Recreation Visitor Day (1995$)	Forest Service		BLM	
		Quantity of Visitor Days (Million)	Imputed Market Value (Million 1995$)	Quantity of Visitor Days (Million)	Imputed Market Value (Million 1995$)
Camping & Picnicking	12.22	85.8	1,048	34.0	348
Fishing	77.62	17.8	1,381	2.4	186
Hunting	51.88	18.9	983	6.3	326
Hiking & Horseback	12.92	32.3	417	6.7	350
Mechanized Travel	11.64	129.0	1,501	9.9	104
Winter Sports	52.38	20.3	1,099	0.7	36
Other	45.44	40.9	1,859	13.4	170
Total		345.1	**8,288**	73.4	**1,520**

488. Sources: Compiled from U.S. FOREST SERVICE, FOREST SERVICE PROGRAM FOR FOREST AND RANGELAND RESOURCES, APPENDIX B, 1990; AGRICULTURAL STATISTICS 1997;

2. *Preservation Benefits*

Measuring preservation benefits raises even more challenging issues than the valuation of recreation. Natural resources that produce preservation benefits are further removed from direct human use and provide various intangible services. Consider some of the diverse characteristics of preservation resources on National Forest System (NFS) and BLM lands: wilderness areas (34 million acres on NFS lands and 5.2 million acres on BLM lands),[489] Wild and Scenic Rivers (4,316 miles on NFS lands and 2,032 miles on BLM lands),[490] fishable streams and rivers (128,000 miles on NFS lands and 174,000 miles on BLM lands),[491] waterfowl habitat (12 million acres on NFS lands and 23 million acres on BLM lands),[492] wildlife, fish and plant species (NFS 13,000 species on NFS lands and 8 thousand species on BLM lands),[493] and threatened or endangered species (283 species on NFS lands and 300 species on BLM lands).[494]

Numerous economic studies attempt to value the benefits of preserving specific natural areas that face proposed development projects.[495] Other studies have estimated the value of specific resources such as wilderness areas,[496] wetlands,[497] and endangered

---

PUBLIC LAND STATISTICS 1994-95.

489. *See* FOREST SERVICE, DEP'T OF AGRIC., DRAFT RESOURCE PLANNING ASSESSMENT PROGRAM, ch. 3, § 3 (1995) (Mar. 29, 1999) <http://www.fs.fed.us/pl/rpa/95rpa/chp3sec3.htm>; PUBLIC LAND STATISTICS 1994/1995, at 282 (1996).

490. *See* ZINSER, *supra* note 117, at 363. *See generally Bureau of Land Management Strategic Plan, Sept. 30, 1997* (visited Mar. 19, 1999) <www.blm.gov/nhp/BLMinfo/stratplan/1997/index.html>.

491. *See generally* Forest Service Index (visited Mar. 19, 1999) <http://www.fs.fed.us/outdoors/wildlife/fish>; *Bureau of Land Management Index* (visited Mar. 19, 1999) <http://www.blm.gov/nhp/facts>.

492. *See generally* Forest Service Index (visited Mar. 19, 1999) <http://www.fs.fed.us/outdoors/wildlife/fish); *Bureau of Land Management Index* (visited Mar. 19, 1999) <www.blm.gov/nhp/facts>.

493. *See generally* SHELLY WITT, USDA FOREST SERVICE WILDLIFE, FISH & RARE PLANTS (Mar. 31, 1991) <http://www.fs.fed.us/outdoors/wildlife>; BUREAU OF LAND MANAGEMENT, DEP'T OF THE INTERIOR, BLM WEBSITE (Mar. 31, 1999) <http://www.blm.gov/nhp>.

494. *See generally* SHELLY WITT, USDA FOREST SERVICE WILDLIFE, FISH & RARE PLANTS (Mar. 31, 1991) <http://www.fs.fed.us/outdoors/wildlife>; BUREAU OF LAND MANAGEMENT, DEP'T OF THE INTERIOR, BLM WEBSITE (Mar. 31, 1999) <http://www.blm.gov.nhp>.

495. *See generally* JOHN C. KRUTILLA & ANTHONY C. FISHER, THE ECONOMICS OF NATURAL ENVIRONMENTS (1975) (reviewing studies on Hells Canyon, White Cloud Peaks wilderness, Mineral King, and the Alaskan pipeline).

496. *See, e.g.*, Richard G. Walsh et al., *Valuing Option, Existence, and Bequest Demands for Wilderness*, 60 LAND ECON. 14 (1984).

497. *See, e.g.*, Francis R. Thibodeau & Bart D. Ostro, *An Economic Analysis of*

species.[498] A recent study by Robert Costanza, Ralph d'Arge, and others takes a new approach.[499] It values entire ecosystems by estimating the various goods and services generated by units of specific types of ecosystems. The authors identify seventeen different ecosystem services (for example, gas regulation, climate regulation, water supply, waste treatment, pollination, genetic resources) that are performed by 16 different biomes or types of ecosystems (for example, coastal estuaries, coral reefs, tropical forests, temperate/boreal forests, grass and rangeland, wetlands, lakes, rivers, and desert). Based on a synthesis of over 100 studies, they develop an estimate of the economic benefit of each ecosystem service for the different biomes in terms of dollars per hectare. The value of the world's ecosystem services are then derived by multiplying the benefit unit per hectare times the total land area for that type of biome.

In order to estimate the economic value of preserving ecosystem services on America's public lands, one can apply the Costanza-d'Arge methodology to specific parcels of federal land that supply these services. Four types of ecosystems characterize most of national forest system and BLM lands: temperate forests, grass and rangelands, wetlands, swamp and floodplains, and lakes and rivers. If benefit parameters are converted to acres and adjusted to 1995 dollars, multiplying these benefit parameters times the corresponding area within the national forest system and BLM lands yields the total imputed market value of the benefits of ecosystem services. Table 2 presents the results of this exercise. The total value of ecosystem services amounts to $71.7 billion from the national forest system, $222.3 billion from BLM lands, and a total of $294.1 billion for both NFS and BLM lands.

Wetland Protection, 12 J. ENVTL. MGMT. 19 (1981).

498. *See, e.g.*, Thomas H. Stevens et al., *Measuring the Existence Value of Wildlife: What Do CVM Estimates Really Show?*, 67 LAND ECON. 390 (1991); Daniel A. Hagen et al., *Benefits of Preserving Old-Growth Forests and the Spotted Owl*, CONTEMP. POL'Y ISSUES, Apr. 1992, at 13.

499. Robert Costanza et al., *The Value of the World's Ecosystem Services and Natural Capital*, 387 NATURE 253 (1997).

Table 2[500]

Benefits of Preservation: Ecosystem Services from the National Forest System and BLM Lands

Type of Ecosystem	Value Per Acre (1995$/acre/yr)	Forest Service		BLM	
		Acres (Million)	Imputed Market Value of Services (Million 1995$/yr)	Acres (Million)	Imputed Market Value of Services (Million 1995$/yr)
Forests-Temperate	110	136.7	15,036	71.1	7,821
Grass-Rangelands	101	46.2	4,654	167.0	16,824
Wetlands-Swamps	7,923	5.4	42,783	24.0	190,147
Lakes-Rivers	3,431	2.7	9,265	2.2	7,549
Total		191.0	**71,739**	264.3	**222,341**

500. Source: Costanza et al., *supra* note 499; Draft 1995 RPA Program; AGRICULTURAL STATISTICS 1997; Forest Service Web Page, *Wildlife and Fish*; PUBLIC LAND STATISTICS 1994-95; BLM Web Page, *Strategic Plan and BLM Facts*; ZINSER, *supra* note 117.

The benefit figures by biome indicate the important role of wetlands on public lands. Despite a relatively small area, the high unit value makes wetlands the most important generator of benefits among the four types of ecosystems. Lakes and rivers provide the second most productive type of ecosystem. Compared to wetlands and lakes, forests and rangelands offer relatively low individual unit value in terms of total benefits.

3. Comparing the Economic Benefits of Commodity, Recreation, and Preservation Uses

The quantification of recreation and preservation benefits permits comparisons to commodity uses. The benefits of timber, grazing, minerals, and recreation were derived according to two different accounting measures for benefits: government receipts and the imputed market clearing price.[501] Table 3 presents the total benefits of commodity uses and recreation and preservation as defined by government receipts and the estimated market value. These estimates illustrate two principles. First, there is a large disparity between the receipts measure and the imputed market value measure. In the national forest system, the traditional commodity uses of timber, grazing, and mining account for 90% of the total receipts, while recreation amounts to only 9% and preservation 0% of total receipts. Second, when benefits are calculated by the imputed market-clearing price, which includes nonmarket benefits, the preservation benefit share rises sharply from 0% to 88%, the recreation benefit share increases slightly to 10%, and the commodity use share falls dramatically to only 2% of total benefits.

On BLM lands, timber contributes the largest share of government receipts at 44%, followed by range and mineral benefits at 17% and 16%, respectively. Benefits from receipts are virtually nonexistent for recreation and preservation. The imputed

501. The Forest Service RPA Program reports utilize three different accounting stances to measure benefits: existing fees, market-clearing prices, and market-clearing prices plus consumer surplus. The analysis here applies to the first two accounting stances. Forest Service timber values and mineral benefits were obtained from Agricultural Statistics and the 1995 Draft RPA Program, respectively. National forest system grazing benefits were calculated using an appraised fair market rental valuation figure derived by the Forests Service. *See* PROGRAM FOR FOREST AND RANGELAND RESOURCES, *supra* note 485, at app. B (utilizing a market appraisal of grazing lands to obtain a clearing price on forage). BLM market values of timber, range and minerals benefits were obtained from BLM's 1997 Strategic Plan. *See* BUREAU OF LAND MANAGEMENT, U.S. DEP'T OF THE INTERIOR, BLM WEBSITE (Mar. 31, 1999) <http://www.blm.gov/nhp>.

market benefits of these different uses convey a very different picture. Mineral benefits become the largest commodity share at 4% of total benefits, and recreation remains a 1% share. Timber and range benefits fall to less than 1%. But preservation, in the form of ecosystem services, accounts for 95% of the benefits from BLM lands.

The estimated market value of ecosystem services on public lands overwhelms the dollar figures attributable to commodity benefits. Recreation and ecosystem benefits within the national forest system are 62 times the size of commodity benefits, while BLM ecosystem and recreation benefits exceed the corresponding commodity benefits by a factor over 20. Moreover, since most of the ecosystem benefits arise entirely outside the market, there is no necessary limitation on their potential size.[502]

502. The objective of this exercise is to illustrate some of the innovative methods that can be used to estimate the benefits of non-market goods and services on public lands. These calculations rely on aggregated data and should only be viewed as preliminary, illustrative calculations. Further research in this area should be able to refine the techniques and improve the level of confidence about such estimates. Land managers seeking to implement an economic efficiency-based policy will obviously need to address quantification issues.

Table 3[503]

Benefits from Commodity Uses, Recreation and Preservation in the National Forest System and BLM Lands

Type of Use	Forest Service (Million 1995$)		BLM (Million 1995$)	
	Receipts to Fed. Govt. 1995 (% of Total)	Imputed Market Value, 1993-95 (% of Total)	Receipts to Fed. Govt. 1995 (% of Total)	Imputed Market Value, 1996 (% of Total)
Timber	303.0 (51%)	616.1 (1%)	45.5 (44%)	109.7 (0%)
Range	8.8 (1%)	64.8[a] (0%)	15.8 (15%)	89.3 (0%)
Minerals	221.6[a] (37%)	605.5[a] (1%)	14.7 (14%)	9,937.2 (4%)
Recreation	52.0 (9%)	**8,288.0 (10%)**	0.9 (1%)	**1,520.0 (1%)**
Preservation: Ecosystem Services	0.0 0%	**71,739.0 88%**	0.0 0%	**222,341.0 95%**
Other	7.3 (1%)		26.8 (26%)	
Total	592.6	**91,313.4**	103.6	**233,997.3**

503. Source: NFS Values— AGRICULTURAL STATISTICS 1997; Draft RPA 1995, Table E.2; RPA Program 1990, Appendix B. BLM Values— PUBLIC LAND STATISTICS 1994-95, Table 3-22; BLM 1997 Strategic Plan. [a]— 1993 data from the Draft 1995 RPA Program.

D. Policy Implications

The economic efficiency theoretical framework and the above preliminary empirical findings permit three observations concerning the management of public lands. First, empirical estimates indicate that there are significant and sizable benefits from recreation and preservation uses of public lands. A policy that views social benefits solely in terms of government receipts, or otherwise neglects non-market benefits, would be economically inefficient.[504] If government land managers omit non-market benefits from their analysis, they will misperceive the demand for recreation and preservation and value them at an unrealistically low level. Indeed, this seems to be what has happened on BLM and Forest Service land, where federal managers have found themselves unprepared to deal with the unprecedented public demand for recreational and preservationist uses of these lands. Their adherence to traditional multiple-use policy has resulted in a quantity of land allocated to the traditional extractive commodities that is inefficient compared to the benefits that are derived from nonconsumptive uses. This policy also assumes that an unrealistic percentage of public lands is actually devoted to consumptive uses.

A second observation concerns technological innovation and population growth. Advances in technology generally lead to a reduction in the quantity of natural resources required to produce a given level of manufactured goods in the economy.[505] To the extent that technology dampens the demand for public lands for extractive uses, there is a corresponding increase in the supply of land for recreation and preservation uses. Technological innovation raises the demand for recreation by increasing leisure time, lowering the cost of transportation to federal lands, and creating new recreational pursuits such as mountain biking, roller blading, and snowboarding.[506] These types of innovations shift upwards the demand for recreation and preservation of

504. *See* Peter Passell, *Economists Point to Values Beyond Price*, N.Y. TIMES, June 2, 1998, at D5.

505. *See* Krutilla, *supra* note 468, at 783. *See generally* SCARCITY AND GROWTH RECONSIDERED (V. Kerry Smith ed., 1979). There are exceptions to the proposition that technological innovation reduces the demand to extract natural resources. Certain types of inventions may actually increase the use of a commodity (for example, conversion of oil shale into gasoline) and create adverse effects on recreation and preservation uses on public lands.

506. *See* ZINSER, *supra* note 117, at 3-9.

land. Furthermore, the demand for recreation and preservation of public land will be augmented by a continuation of the growth in the population of the Western states, which have the largest holdings of federal lands.[507] Over the past two decades, the mountain region states experienced population growth rates at double to triple the rate of the nation as a whole.[508] A continuation of Western United States population trends and technological innovation in the future will shift the demand for recreation and preservation land even further, and increase the optimal allocation of public land allocated to recreation and preservation.

Finally, because an efficiency goal would also entail consideration of costs, federal land managers adopting such a goal might consider restricting access to public lands in order to limit degradation of the natural resources or curtail negative congestion effects for recreational visitors. Land managers could restrict entry by an administrative permitting process based on historical use, random lottery, or some other criteria.[509] Alternatively, a user fee system provides certain advantages for implementing an efficient policy.[510] An appropriately set user fee reflects the scarcity value of public lands and generates a level of use consistent with the efficient allocation of public lands. User fees provide revenue to the federal government that can be used to carry out good management policies. Such fees can be adjusted over time to reflect the changing scarcity value of public lands in light of a growing population and technological innovation.

---

507. *See* SCARCITY AND GROWTH, *supra* note 506, at 8.

508. The percentage change in population in the mountain region was 37.2% for 1970-80, 20.1% for 1980-90, and 14.5% for 1990-95. The corresponding percentage increases for the entire U.S. was 11.4%, 9.8%, and 5.6%, respectively. *See* BUREAU OF THE CENSUS, DEP'T OF COMMERCE, STATISTICAL ABSTRACT OF THE UNITED STATES 1996, 29 (1996).

509. In a recent proposal concerning rafting on the Salmon River in Idaho, the Forest Service plans to reduce the number of people allowed on raft trips down the Middle Fork of the Salmon River by 50% and reduce the number rafting down the main Salmon River by 30%. *See U.S. Proposes Tighter Limits On Rafting on Salmon River*, N.Y. TIMES, Jan. 26, 1998, at A10.

510. *See generally* Marion Clawson, *Major Alternatives for the Future Management of the Federal Lands*, *in* RETHINKING THE FEDERAL LANDS 204 (Sterling Brubaker ed., 1984); ANDERSON & LEAL, *supra* note 456, at 76. Recently, the Forest Service initiated a pilot program that imposes "recreational fees" at over 100 sites in the U.S. and will continue to run until the year 1999. *See* Larry Gerber, *Forest Service 'Test' Fees Have Both Foes and Fans*, DENVER POST, Jan. 15, 1998, at 21A; *see also* Nancy Lofholm, *Paying to Play Ouray County: Use Fee Proposed in Popular Basin*, DENVER POST, June 12, 1998, at 6B. *But cf.* United States v. Maris, 987 F. Supp. 865 (D. Or. 1997) (holding that merely driving through national forest area was not a recreational "use" of that area subject to the exaction of a user fee).

CONCLUSION

The era of multiple use has ended, not because federal managers have deliberately abandoned it, but because users of public lands have ignored it, deciding instead that recreation and preservation should be dominant. Dominant use has certain advantages over multiple use, especially since it has a better chance of achieving economic efficiency. If one applies an efficiency criterion to public lands policy, it does not necessarily require that recreation and preservation will become the preferred dominant uses. Efficiency is value neutral. It is satisfied by whatever mix of commodity and noncommodity uses maximizes overall net social benefits and by whatever method achieves it, be it user fees, permit systems that encourage uses that optimize the mix of public land uses, or some other system that yields the maximum benefit for the greatest number of people.