

# THE TRANSFORMATION ON PUBLIC LANDS

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#### INTRODUCTION

Federal public lands comprise nearly one-third of the United States' entire land base.<sup>1</sup> For the most part, these lands have been managed according to the multiple-use doctrine.<sup>2</sup> Con-

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1. See BUREAU OF LAND MANAGEMENT, U.S. DEP'T OF THE INTERIOR, PUBLIC LAND STATISTICS 5 (1991) (the federal government owns almost 30% of the land within the United States). The amount of federally owned land has remained relatively constant over the past two decades, decreasing slightly from 761 million acres in 1973 to 657 million acres in 1994. Compare BUREAU OF LAND MANAGEMENT, U.S. DEP'T OF THE INTERIOR, PUBLIC LAND STATISTICS 10 (1974) with BUREAU OF LAND MANAGEMENT, U.S. DEP'T OF THE INTERIOR, PUBLIC LAND STATISTICS 6 (1996). Most of these federally-owned lands are subject to the management and administrative control of four federal agencies, the Bureau of Land Management (BLM), the Fish and Wildlife Service (FWS), the National Park Service (NPS), and the Forest Service. The BLM, FWS, and NPS are within the U.S. Department of the Interior and the Forest Service is within the U.S. Department of Agriculture. The term "multiple use" is defined in FLPMA for BLM lands as "a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources . . ." 43 U.S.C. § 1702(c) (1994). For Forest Service lands, multiple use is deemed satisfied under the Multiple-Use Sustained-Yield Act of 1960 when national forests are administered for "outdoor recreation, range, timber, watershed, and wildlife and fish purposes." 16 U.S.C. § 528 (1994).

2. The agencies with the most acreage under their control, the BLM and the Forest Service, have, by tradition and statutory mandate, imposed a multiple use

ceptually, this doctrine contemplates the simultaneous production of a variety of resources and outputs through scientific planning.<sup>3</sup> In actuality, federal land managers have favored particular kinds of uses—the development and extraction of commodity resources, including minerals, energy resources, timber, and livestock forage.<sup>4</sup> In recent years, however, America's public

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management philosophy on their lands. See 3 GEORGE CAMERON COGGINS & ROBERT L. GLICKSMAN, *PUBLIC NATURAL RESOURCES LAW* § 16.01[1] (1997); CHARLES F. WILKINSON, *CROSSING THE NEXT MERIDIAN: LAND, WATER, AND THE FUTURE OF THE WEST* 20-21, 75-218 (1992). The BLM and Forest Service control 463 million acres—272 million acres for BLM and 191 million acres for the Forest Service. These "multiple use" lands constitute over 73% of the federal land base. *Id.*

3. The standard statutory definition of multiple use is found in the Multiple-Use Sustained-Yield Act of 1960:

'Multiple use' means: The management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people; . . . and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources . . . .

16 U.S.C. § 531(a) (1994).

Similar definitions appear in the organic acts for the two primary federal multiple use agencies, the Bureau of Land Management and the Forest Service. See *Federal Land Management and Policy Act of 1976* § 1702(c), 43 U.S.C. § 1701 (1994) (BLM); *National Forest Management Act of 1976*, 16 U.S.C. § 1600 (1994) (Forest Service).

4. Another commodity resource found on public lands, water, will not be discussed in this article because of the unique nature of the legal relationship that exists between private parties and water "created" for private use through federal reclamation projects. Federal reclamation laws, particularly the Reclamation Act of 1902, ch. 1093, 32 Stat. 388, were intended to support farms in areas irrigated by federal reclamation projects. See *Nevada v. United States*, 463 U.S. 110, 115 (1983). Under these laws, private agricultural interests who agreed to repay the federal government's cost of constructing reclamation projects over a period of up to 50 years received irrigation water at a fraction of the government's cost of providing it. Federal taxpayers subsidized the remainder of the cost. See RICHARD W. WAHL, *MARKETS FOR FEDERAL WATER: SUBSIDIES, PROPERTY RIGHTS, AND THE BUREAU OF RECLAMATION* 11-25 (1989); U.S. GENERAL ACCOUNTING OFFICE, *NATURAL RESOURCES MANAGEMENT ISSUES* 16-17 (1992) (transition series no.17). Although this Article will not focus on water as a commodity resource on public lands, it should be pointed out that federal water is undergoing the same transformation as that experienced by the other commodity resources—minerals, timber, and forage. First, there has been a steep decline in the amount of activity associated with the use of the water commodity on federal lands. The last major authorization for reclamation construction projects occurred in the late 1960s. Between 1988 and 1994, the Bureau of Reclamation had to undergo a major reorganization as construction on projects authorized in the 1960s and earlier drew to an end. See *Bureau of Reclamation Home Page: Written in Water* (visited Mar. 16, 1999) <<http://www.usbr.gov/main/written/contents.html>> [hereinafter *Written in Water*]. Second, this decline in water projects on federal lands was caused in part by the American environmental movement's strong opposition to water development projects. See *id.* Third, existing Bureau of Reclamation reservoirs and project lands are increasingly being used for a noncommodity purpose—recreation. Between 1966 and 1990, the number of recreational visits to Bureau of Reclamation properties

lands have undergone a fundamental change. They are now dominated by just two non-consumptive uses—recreation and preservation.

The emergence of these dominant uses of public lands is a startling development. For nearly a century, this country's federally owned lands were valuable chiefly for their natural resources that could be removed by private commodity interests. What could have caused the dramatic and sudden change from a regime of resource extraction to a system of play and preservation? Moreover, since the new dominant uses seem to be strengthening their hold on public lands, the continued viability of multiple use as a management policy is questionable. It is internally contradictory to apply a multiple-use strategy to only two dominant uses, particularly in light of the inherent conflicts between these new dominant uses and the older extractive uses.<sup>5</sup> The problem is further aggravated by the reality that multiple use was historically grounded in commodity exploitation, the complete opposite of recreation and preservation.

Such changes suggest that future conflicts pertaining to public use will not be fought along the traditional lines of commodity versus noncommodity use. Indeed, that battle has already been largely conceded by commodity developers. Instead, the looming conflict in public land use will be between two former allies—recreation and preservation interests. Such a conflict is particularly likely to arise between low-impact, human-powered recreational users (preservationists) and high impact, motorized recreational users (recreationists).

Although the transformation from commodity to recreation and preservation-based use is the single most important event on public lands in the past two decades, it has received surprisingly little attention.<sup>6</sup> Part I of this Article presents data demonstrating the nature and extent of this change. The data illustrate

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nearly doubled, from 45 million to 80 million. See BUREAU OF RECLAMATION, DEP'T OF THE INTERIOR, 1991 SUMMARY STATISTICS: WATER, LAND, AND RELATED DATA 11 (1991).

5. Federal land management statutes usually pair multiple use with a companion concept: sustained yield. The term "sustained yield" means "the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources . . ." 16 U.S.C. § 531(b) (1994); 43 U.S.C. § 1702(h) (1994); see also 16 U.S.C. § 529 (1994); 43 U.S.C. § 1732(a) (1994). For many years, the idea of sustained yield justified decisions by federal land managers to maintain a given level of periodic output of commodity products, such as grazing on public rangelands or timber harvesting on Forest Service lands.

6. Some commentators have acknowledged the transformation. See, e.g., THOMAS M. POWER, LOST LANDSCAPES AND FAILED ECONOMIES: THE SEARCH FOR A VALUE OF PLACE (1996); GUNDARS RUDZITIS, WILDERNESS AND THE CHANGING AMERICAN WEST (1996); WILKINSON, *supra* note 2.

that commodity uses of public lands, including timber harvests, forage for cattle and sheep, mining of hardrock minerals, and development of energy minerals, are in decline. Part I also shows that recreation on multiple-use lands is increasing at a dramatic pace, while lands dedicated to preservation are expanding both in scope and area. Part II examines why these changes have occurred, asserting that simple economics is the primary explanation. Part III questions the viability of multiple use as a management standard in light of the rise of two dominant uses. Multiple use has failed to accomplish its goal of simultaneously producing compatible resources. More significantly, the doctrine will likely fail to adequately referee the coming dispute between recreation and preservation.

Part IV offers an efficiency criterion as an alternative to the multiple-use land-management philosophy.<sup>7</sup> It explains how efficiency principles applied to public lands may deal more realistically with intangible recreational and nonuse values. Indeed, efficiency may also achieve what multiple use promised, yet failed to deliver: the allocation, development, and maintenance of public lands resources in order to bring about an overall increase in social welfare.<sup>8</sup>

More specifically, Part IV calculates the economic value of recreation and preservation uses by employing passive use values. These values, known as option and existence values, respectively, seek to measure the utility enjoyed by people from a resource. Option value measures what a person is willing to pay to reserve the future right to use the resource. Existence value quantifies the satisfaction derived from a resource's continuing existence, regardless of whether a person will ever use the resource. When option and existence values are employed to calculate an imputed market-clearing price that includes non-market benefits, the results are startling. The imputed market

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7. Many scholars have attempted to formulate an alternative to multiple use as a preferred public lands management standard. See, e.g., Robert L. Glicksman, *Fear and Loathing on the Federal Lands*, 45 U. KAN. L. REV. 647 (1997); Michael I. Jeffery, *Public Lands Reform: A Reluctant Leap into the Abyss*, 16 VA. ENVTL. L.J. 79 (1996); Michael C. Blumm, *Public Choice Theory and the Public Lands: Why "Multiple Use" Failed*, 18 HARV. ENVTL. L. REV. 405 (1994); Scott W. Hardt, *Federal Land Management in the Twenty-First Century: From Wise Use to Wise Stewardship*, 18 HARV. ENVTL. L. REV. 345 (1994); Robert B. Keiter, *Beyond the Boundary Line: Constructing a Law of Ecosystem Management*, 65 U. COLO. L. REV. 293 (1994); Steven E. Daniels, *Rethinking Dominant Use Management in the Forest-Planning Era*, 17 ENVTL. L. 483 (1987).

8. See, e.g., John D. Leshy, *Sharing Federal Multiple-Use Lands—Historic Lessons and Speculations for the Future*, in *RETHINKING THE FEDERAL LANDS* 235 (Sterling Brubaker ed., 1984).

benefits of public lands devoted to recreation and preservation far exceed the economic benefits of commodity extraction uses. Furthermore, the data suggest that the value of preservation, a non-use, overwhelms the economic benefits of recreation and commodity uses. The Article concludes that these surprising results should be taken seriously because they suggest that current public lands policy is grossly inefficient. An efficiency framework seems far preferable to an outdated reliance on multiple use because existing policy does not take into account measurable non-market benefits of recreation and preservation.

## I

## CHANGING USES OF PUBLIC LANDS

Public lands have experienced a fundamental shift in use over the past thirty years. The traditional commodity uses identified with Western folklore—timber, grazing, and mining operations—play a relatively less important role in the modern economy of the New West than in times past. For instance, logging on national forest land is down from 12 billion board-feet a decade ago to less than 4 billion board-feet in 1998. Livestock grazing in the West is down from 17 million head in 1934 to 2 million today. In 1983, 8,500 oil and gas wells were drilled on public and private land, while in 1996 that number had fallen to 1,900 wells drilled. Between 1954 and 1998, the number of hardrock mines fell from 3,300 to about 1,000, and mining employment from 103,000 to 57,000.<sup>9</sup>

This decrease in commodity use parallels an emerging fact about public lands—they are chiefly valuable for non-consumptive uses. Outdoor recreation is a \$350 billion industry (in terms of gross national product), with approximately \$140 billion attributable to public lands.<sup>10</sup> Consequently, there is a growing demand for public lands from recreational users, and a corresponding commitment towards environmental preservation. The Forest Service and BLM recorded 345 million and 73 million

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9. See Peter Chilson, *An Era Ends: Old Industries Face Reality*, HIGH COUNTRY NEWS, April 27, 1998, at 12-13. Some of the decline in the number of wells drilled is due to increased efficiency in petroleum exploration. With the introduction of 3-D seismology, drill crews are often certain that their wells will find an oil or gas reservoir, reducing the need for many exploratory wells. The reduction in hardrock mines must be analyzed in light of the mining industry's generally rising production levels and that industry's substantial contribution (\$15 billion in 1995) to the U.S. economy. *Id.* at 12.

10. See *Center Completes Report on Federal Public Land Values*, RESOURCE LAW NOTES (Natural Resources Law Center, Univ. of Colo. School of Law, Boulder, Colo.), Summer 1998, at 7.

recreational visitor days in 1995, an enormous increase from previous levels. Furthermore, public lands set aside for preservation purposes, such as wildlife refuges and wilderness areas, have grown dramatically.<sup>11</sup> Even more land will be subject to preservation restrictions as a result of the Endangered Species Act<sup>12</sup> and the designation as wilderness of certain tracts of roadless areas identified in the public lands inventory.<sup>13</sup>

### A. Historical Perspective

The recent transition in use of public lands is consistent with the historic pattern experienced by public land law. Policies governing public lands have evolved in a dynamic fashion that tend to mirror changes in the public perception about the proper role of these lands. From the birth of the United States to the mid-twentieth century, four distinct eras of public lands can be identified: acquisition, disposal, retention, and management.<sup>14</sup> Each has been characterized by its own set of laws that exemplified circumstances unique to the period. This pattern suggests that new eras reflect changing social values by the relative shifts in the demand for, and supply of, particular resources.

The era of acquisition arose from a political dispute between the newly created states seeking control of the Western territory.<sup>15</sup> Seven of the original thirteen colonies claimed the territory extending westward to the Mississippi River.<sup>16</sup> The remaining six feared that their political power would be diminished over time if those seven expanded in size and population. In response to these concerns, the Constitution granted the Western territories to the federal government rather than the states.<sup>17</sup> Thereafter, the federal government adopted a policy of expanding the westward territory by conquest and negotiation of treaties with foreign powers. The acquisition era, which ranged from colonial

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11. See *infra* notes 144-56 and 161-66 and accompanying text.

12. 16 U.S.C. §§ 1531-1544 (1994).

13. 43 U.S.C. § 1782 (1994).

14. See, e.g., James L. Huffman, *The Inevitability of Private Rights in Public Lands*, 65 U. COLO. L. REV. 241, 245-54 (1994) (identifying "acquisition," "disposal," "retention," and "management" as four historical eras); see also, e.g., MARION CLAWSON, *THE FEDERAL LANDS REVISITED* 15-39 (1983).

15. See Huffman, *supra* note 14, at 246.

16. The seven states with western land claims were Massachusetts, Connecticut, New York, Virginia, North Carolina, South Carolina, and Georgia. The five states without western land claims were Maryland, Delaware, New Jersey, Rhode Island, and New Hampshire. See *id.* at 246 n.18.

17. See generally *id.* at 246; Paul W. Gates, *The Federal Lands—Why We Retained Them*, in *RETHINKING THE FEDERAL LANDS* 35 (Sterling Brubaker ed., 1984).



times to 1867, led to a fourfold increase in United States land size in just one hundred years.<sup>18</sup>

Dual influences then led to a disposal era. This era promoted Jeffersonian democracy by providing land for the yeoman farmer, while, in keeping with more pragmatic Hamiltonian concerns, raising revenue to reduce the federal debt.<sup>19</sup> During this era, the federal government established surveys and a governing framework for the territories,<sup>20</sup> opened land to disposition through homestead acts,<sup>21</sup> and granted long corridors of alternating sections of land to railroads as an incentive to build tracks westward.<sup>22</sup> In addition to the land itself, various policies transferred resource rights to those seeking to develop the West.<sup>23</sup>

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18. See Huffman, *supra* note 14, at 246; see also CLAWSON, *supra* note 14, at 15-17. The major additions include: (1) Louisiana Purchase from France in 1803—827,192 square miles; (2) Treaty with Spain for Florida and portions of Louisiana in 1819—72,003 square miles; (3) Republic of Texas annexed in 1845—390,143 square miles; (4) Oregon Compromise with Britain in 1846—285,580 square miles; (5) Mexican Cession of western states in 1848—529,017 square miles; (6) Gadsden Purchase from Mexico in 1853—29,640 square miles; (7) Alaskan Purchase from Russia in 1867—586,412 square miles; (8) Hawaii annexed in 1898—6,450 square miles. See BUREAU OF THE CENSUS, DEP'T OF COMMERCE, HISTORICAL STATISTICS OF THE UNITED STATES: COLONIAL TIMES TO 1970, at 428 (1975).

19. See Gates, *supra* note 17, at 36.

20. The Land Ordinance of 1785 established surveys of western lands and created the division of land into townships and sections. The Northwest Ordinance of 1787 governs the framework of new territories, and the process to statehood. See JAN G. LAITOS, NATURAL RESOURCES LAW: CASES AND MATERIALS 243 (1985).

21. Various homestead acts granted land to those who maintained and cultivated it for a specified number of years. See, e.g., Preemption Act of 1841, ch. 16, 5 Stat. 453 (1841) (repealed 1891) (validating land claims to squatters of surveyed federal lands); Homestead Act of 1862, ch. 75, 12 Stat. 392 (repealed 1976) (permitting any citizen over 21 years of age to claim up to 160 acres of land provided that the homesteader maintained and cultivated land for five years); Desert Land Act of 1877, 43 U.S.C. §§ 321-339 (as amended 1994) (allowing a homesteader to claim up to 640 acres on the arid land west of the 100th meridian); Enlarged Homestead Act of 1909, ch. 160, §§ 1-6, 35 Stat. 639, 639-40 (1909) (repealed 1976) (enlarging the homestead lots to 320 acres for land designated by the USGS); Stock-Raising Homestead Act of 1916, 43 U.S.C. §§ 291-302 (repealed 1976, except § 299) (authorizing entry on 640 acres designated as valuable for grazing).

22. See Pacific Railway Act of 1862, ch. 120, 12 Stat. 489 (1862) (granting land for the first transcontinental line).

23. The Timber Culture Act transferred productive timberland in the Pacific Northwest to private landowners. Timber Culture Act, ch. 277, 17 Stat. 605 (1873) (repealed 1891). The Timber and Stone Act protected the right of state nonresidents to cut timber from unentered mining lands. Timber and Stone Act, ch. 151, 20 Stat. 89 (1873) (repealed 1955). The General Mining Law of 1872 permitted the free and open exploration of minerals on federal land and allowed miners to claim lands upon the discovery of minerals. General Mining Act of 1872, ch. 152, 17 Stat. 91 (1872) (current version at 30 U.S.C. §§ 21-42 (1994)). See generally LAITOS, *supra* note 20, at 250-51; Huffman, *supra* note 14, at 248-49.

In response to perceived over-exploitation and wanton abuse of public lands by the private sector resulting from the disposal era, public land management policies entered the reservation era in the late nineteenth and early twentieth centuries.<sup>24</sup> A new conservation ethic prompted the federal government to reserve certain types of land and resources from disposition for private use.<sup>25</sup> Accordingly, Congress and the Executive Branch withdrew several mineral commodities and virtually all public rangeland from private entry and acquisition.<sup>26</sup>

The current management era began in the early twentieth century. It arose from a growing consensus to retain ownership and control the use of federal lands for the public good.<sup>27</sup> Once the federal government assumed the role of long-term owner rather than disposer, it faced the fundamental problem of any property owner—how to allocate these lands, and their resources, among competing uses. During the early part of the twentieth century, when demand on federal land was relatively low, management was “custodial” in nature and largely limited to trespass and fire prevention.<sup>28</sup> With the increasing demand for competing uses of public lands over the century, more sophisticated management tools became necessary.<sup>29</sup>

The concept of multiple use was deployed as a management tool for most federally-owned lands, particularly those of the Bureau of Land Management.<sup>30</sup> During the heyday of the multiple-

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24. See generally CLAWSON, *supra* note 14, at 27; Gates, *supra* note 17, at 42-47.

25. See generally CLAWSON, *supra* note 14, at 28-31; Gates, *supra* note 17, at 48-53.

26. President Theodore Roosevelt reversed the principle of free access to mineral resources by withdrawing 66 million acres of coal land from all forms of entry in 1906. The Coal Lands Acts of 1909 and 1910 severed the right to the underlying coal from the surface estate and reserved the coal for the U.S. See LARTOS, *supra* note 20, at 266. The Mineral Leasing Act of 1920 withdrew energy minerals (coal, natural gas, and oil) from the locational system to the leasing system. Mineral Leasing Act of 1920, 30 U.S.C. §§ 181-287 (1994). The Taylor Grazing Act of 1934 signaled the final closure of the disposal period by creating a regulatory structure limiting grazing on public domain lands. Taylor Grazing Act of 1934, 43 U.S.C. § 315-315(r) (1994); see also Huffman, *supra* note 14, at 250-52. For example, in response to excessive timber cutting, the General Revision Act of 1891 authorized the President to set aside public domain forest lands as forest reserves. General Revision Act of 1891, ch. 561, § 24, 26 Stat. 1095, 1103 (1891) (repealed 1976).

27. See Huffman, *supra* note 14, at 252-53; Gates, *supra* note 17, at 53-54.

28. See generally CLAWSON, *supra* note 14, at 31-37; LARTOS, *supra* note 20, at 268.

29. Clawson identifies a “custodial management” period from the early 1900s to 1950, an “intensive management” period from 1950 to 1970, and a “consultation and confrontation” period from 1970 to the early 1980s. See CLAWSON, *supra* note 14, at 15-16, 31-56.

30. See generally Hardt, *supra* note 7.

use management era (1930-1970), commodity uses of federal lands were dominant.<sup>31</sup> In the 1970s, however, new environmental laws (triggered by a burgeoning environmental movement) led to growing restrictions on the traditional extractive uses of public lands.<sup>32</sup>

### B. *The Rise and Fall of Traditional Commodity Uses on Public Lands*

Two federal agencies have had the primary role of managing federal lands for traditional commodity purposes over the past century. The first is the Forest Service, which originated during the reservation era, following the creation of the forest reserve system.<sup>33</sup> The second agency, the Bureau of Land Management (BLM), was created in 1946 by a merger of the General Land Office and the Grazing Service.<sup>34</sup>

Gifford Pinchot became the first chief forester of the Forest Service in 1905 after successfully lobbying for the transfer of forest reservations from the Department of the Interior to the Department of Agriculture. Pinchot called for the application of scientific principles of forestry that would yield sustained harvests over time. He and his successors ordered that the national forests be managed according to the multiple-use concept, primarily emphasizing timber harvesting and watershed protection.<sup>35</sup> In Pinchot's view, reflected in official Forest Service policy for several decades, multiple use was best accomplished when the for-

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31. See generally Kelly Nolen, *Residents at Risk: Wildlife and the Bureau of Land Management's Planning Process*, 26 ENVTL. L. 771, 832-33 (1996); Blumm, *supra* note 7, at 426-27.

32. See, e.g., Wilderness Act of 1964, 16 U.S.C. §§ 1131-1136 (1994); National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. §§ 4321-4370 (1994); Endangered Species Act (ESA) of 1973, 16 U.S.C. §§ 1531-1544 (1994). Congress incorporated various environmental considerations in the modern statutory authority of the Forest Service and BLM. See Federal Land Policy and Management Act (FLPMA) of 1976, 43 U.S.C. §§ 1701-1784 (1994); National Forest Management Act (NFMA) of 1976, 16 U.S.C. §§ 1600-1614 (1994).

33. The Organic Act of 1897 authorized the President to reserve forest lands. Organic Act of 1897, 16 U.S.C. § 475 (1994).

34. See CLAWSON, *supra* note 14, at 37.

35. See Huffman, *supra* note 14, at 252. The Organic Act of 1897 provided:

No national forest shall be established, except to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States; but it is not the purpose or intent of these provisions, or of said section, to authorize the inclusion therein of lands more valuable for the mineral therein, or for agricultural purposes, than for forest purposes.

16 U.S.C. § 475 (1994) (emphasis added).

est was "used" for its principal economic commodity—the harvesting of trees.<sup>36</sup> Congress officially sanctioned the multiple-use concept in the national forests in passing the Multiple-Use Sustained Yield Act of 1960.<sup>37</sup>

As the debate over managing National Forests intensified over the next decade, Congress expanded the Forest Service's planning role with the 1974 Renewable Resources Planning Act (RPA)<sup>38</sup> and the National Forest's Management Act of 1976 (NFMA).<sup>39</sup> Both acts adopted the principle of multiple-use management.<sup>40</sup> Today, the Forest Service manages the 191-million acre National Forest System, which consists of national forests, national grasslands, land utilization projects, research and experimental areas, and other types of land.<sup>41</sup> Its management philosophy continues to be governed largely by multiple use.<sup>42</sup>

The BLM is the nation's primary land management agency, controlling just over 264 million acres of federal land.<sup>43</sup> Prior to the formation of the BLM, the General Land Office' had the primary responsibility for management and disposal of public domain lands under the homestead laws, state land grants, and mining laws.<sup>44</sup> It also managed the productive timber lands in Oregon known as the Oregon and California (O&C) lands.<sup>45</sup> In contrast to the General Land Office, the Grazing Service enforced regulations promulgated under the Taylor Grazing Act of 1935.<sup>46</sup> Since BLM's creation, its primary focus has been the continued support of the traditional commodity uses of grazing, mining,

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36. See COGGINS & GLICKSMAN, *supra* note 2, § 16.01 [1]; see also William Andrew Shutkin, Note, *The National Park Service Act Revisited*, 10 VA. ENVTL. L.J. 345, 347-48 (1991).

37. 16 U.S.C. §§ 528-531 (1994).

38. 16 U.S.C. §§ 1601-1610 (1994).

39. 16 U.S.C. §§ 1600, 1611-1614, 472a, 521b (1994).

40. See John V. Krutilla & John A. Haigh, *An Integrated Approach to National Forest Management*, 8 ENVTL. L. 373, 375 (1978).

41. See NATIONAL AGRICULTURAL STATISTICS SERVICE, DEPT OF AGRIC., AGRICULTURAL STATISTICS XII-27 (1995-1996).

42. See FOREST SERVICE, DEPT OF AGRIC., THE FOREST SERVICE PROGRAM FOR FOREST AND RANGELAND RESOURCES: A LONG-TERM STRATEGIC PLAN 4-5 through 4-9 (1990); see also COGGINS & GLICKSMAN, *supra* note 2, at 16-19; JOHN B. LOOMIS, INTEGRATED PUBLIC LANDS MANAGEMENT 221-22 (1993).

43. See PUBLIC LAND STATISTICS (1996), *supra* note 1, at vi.

44. See CLAWSON, *supra* note 14, at 35.

45. The Oregon and California railroad obtained these lands in an 1869 land grant. When the railroad violated the terms of the grant, the federal government repossessed the land and transferred management responsibility to the General Lands Office. See *id.* at 19.

46. See *id.* at 35.

and timber.<sup>47</sup> In 1964, Congress extended multiple-use management philosophy to the BLM.<sup>48</sup> Consequently, when Congress revised the BLM's statutory framework in the Federal Land Policy and Management Act of 1976 (FLPMA),<sup>49</sup> it embraced the multiple-use philosophy.<sup>50</sup>

Operating under the mandate of multiple use, the Forest Service and the BLM historically have permitted commodity uses to dominate the public lands.<sup>51</sup> More recently, however, these uses of public lands have been declining. The following section examines the historical data depicting the general downward trend of the three major commodities: timber, grazing, and mining (hardrock and energy minerals).

### 1. Timber

Timber production is the largest generator of receipts for both the Forest Service and the BLM.<sup>52</sup> Of the nation's 490 million acres of timberland, 19.7% belonged to the federal government and 17.3% was National Forest land.<sup>53</sup> In the early years, from 1905 to 1930, Forest Service timber cuts remained below 2 billion board feet, largely because of an ample supply of timber from private lands.<sup>54</sup> During the 1930s, the onset of the Great Depression reduced the overall economic demand for lumber.<sup>55</sup> In response to falling lumber prices and the threat of private timber stock liquidations, the forest product industry attempted to stabilize prices by organizing and restricting output under the New Deal' National Recovery Act. The Forest Service accommodated this effort by reducing its timber sales.<sup>56</sup> After the nation

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47. See Nolen, *supra* note 31, at 832-33.

48. Act of Sept. 19, 1964, Pub. L. No. 88-607, 78 Stat. 986 (1964) (repealed 1970).

49. 43 U.S.C. §§ 1701-1784 (1994).

50. See 43 U.S.C. § 1702(c) (1994).

51. See generally WILKINSON, *supra* note 2; Blumm, *supra* note 7.

52. Forest Service receipts from timber as a percentage of total receipts were 91% in 1988 and 78% in 1995. See AGRICULTURAL STATISTICS, *supra* note 41, at XII-28 (1997). BLM sales of timber as a percentage of total receipts were 86% in 1988 and 63% in 1996. Compare PUBLIC LAND STATISTICS (1988), *supra* note 1, at 101, with PUBLIC LAND STATISTICS (1996), *supra* note 1, at 119.

53. "Timberland" is defined as "forest land that is producing or is capable of producing crops of industrial wood and that is not withdrawn from timber utilization by statute or administrative regulation. Areas qualifying as timberland have the capability of producing more than 20 cubic feet per acre per year of industrial wood in natural stands." AGRICULTURAL STATISTICS (1995-1996), *supra* note 41, at XII-24.

54. See CLAWSON, *supra* note 14, at 73.

55. See *id.*

56. See *id.* at 75.

rebounded from the Great Depression and World War II, the economy enjoyed approximately 25 years of expansion that led to a growing demand for timber from public land. Accordingly, timber harvests on National Forest lands rose from 2 billion board feet to over 12 billion board feet by the mid-1960s.<sup>57</sup> By the early 1980s, National Forest timber cuts<sup>58</sup> began a marked decline that has continued in the 1990's to less than 4 billion board feet.<sup>59</sup> This decline in timber cut has occurred despite a robust national economy and a fairly strong housing sector.<sup>60</sup>

BLM-managed timber harvests on public domain and the productive O&C lands amount to about 10% of the Forest Service timber harvests.<sup>61</sup> Prior to 1940, timber sales from the O&C lands were rather small because of an inadequate legal mandate to manage these lands and the low demand for Oregon timber.<sup>62</sup> Timber sales from BLM lands rose after World War II, mirroring the increase on Forest Service lands, and leveled off during the mid-1960s to the mid-1980s. After 1990, however, BLM timber cuts dropped over 90% from the levels maintained during the late 1980s.<sup>63</sup>

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57. See *id.* The long upward trend exhibits some sensitivity to the short-run fluctuations of the business cycle. There have been slight dips corresponding to the relatively minor recessions of 1952-53, 1958, and 1960.

58. The one exception to this downward trend was in the late 1980s, when the economy was booming and the political climate accommodated higher levels of timber cuts. Gross Domestic Product increased 17.9% from 1984 to 1989 in real 1992 dollars. See BUREAU OF THE CENSUS, U.S. DEPT OF COMMERCE, STATISTICAL ABSTRACT OF THE UNITED STATES 443 (1996).

59. The 1995 timber cut was 3.8 million board feet. In contrast, the timber cut in 1987, 1988, and 1989 was 12.7 million board feet, 12.6 million board feet, and just under 12.0 million board feet, respectively. See AGRICULTURAL STATISTICS (1997), *supra* note 41, at XII-27.

60. Gross Domestic Product increased 9.8% from 1990 to 1995 in real 1992 dollars. See STATISTICAL ABSTRACT, *supra* note 58, at 443. Housing starts for new privately owned housing units increased 13.5% from 1990 to 1995. *Id.* at 713.

61. Compare the volume of timber cut in million board feet (mbf) between Forest Service and BLM lands in 1993 (5,917 mbf on FS lands and 87 mbf on BLM lands or 1.4%), 1990 (10,500 mbf on FS lands and 1,222 mbf on BLM lands or 11.6%), and 1980 (9,178 mbf on FS lands and 1,197 mbf on BLM lands or 13.0%). Compare AGRICULTURAL STATISTICS (1995-1996), *supra* note 41, and AGRICULTURAL STATISTICS (1985), *supra* note 41, at 487, with PUBLIC LAND STATISTICS (1980), *supra* note 1, at 62, and PUBLIC LAND STATISTICS (1990), *supra* note 1, at 32, and PUBLIC LAND STATISTICS (1993), *supra* note 1, at 33.

62. See CLAWSON, *supra* note 14, at 77.

63. BLM timber sales in 1986 and 1987 were 1.55 and 1.27 billion board feet, respectively. By 1992 and 1993, they had dropped to 0.13 and 0.09 billion board feet, respectively. Compare PUBLIC LAND STATISTICS (1986), *supra* note 1, at 22, and PUBLIC LAND STATISTICS (1987), *supra* note 1, at 22, with PUBLIC LAND STATISTICS (1992), *supra* note 1, at 33, and PUBLIC LAND STATISTICS (1993), *supra* note 1, at 33.

## 2. Grazing

The grazing of domestic livestock is the oldest use of federal lands and requires the greatest acreage.<sup>64</sup> Although grazing accounts for only a small fraction of total receipts for the Forest Service and BLM,<sup>65</sup> it has extremely important implications for regional economies built on the expectation of livestock access to federal lands. Western ranching operations typically prefer to graze animals on federal lands during the spring and summer, and utilize forage grown from adjacent private lands during the winter.<sup>66</sup> This system of "commensurate rights" links the right to graze federal lands with the value of private lands and their associated water rights.<sup>67</sup>

Before federal land management, early Western settlers practiced large-scale grazing on the open plains because arid conditions did not support agriculture or grazing on small plots of land.<sup>68</sup> Between 1870 and 1890, cattle drives took livestock to the Northern plains over the winter months as a means of killing disease-carrying ticks.<sup>69</sup> By the 1890s, ranchers had expanded grazing to most of the Western range, and livestock totals in the West reached 20 million head.<sup>70</sup>

At the turn of the century, the newly formed Forest Service began to restrict grazing on Forest Reserves due to overuse of the land.<sup>71</sup> In its early transition years, from 1905 to 1914, the Forest Service stabilized the level of grazing sheep and goats, and allowed for marginal increases of cattle and horses. Grazing increased by 33% during World War I.<sup>72</sup> The Forest Service soon realized that the land could not sustain such high levels of grazing and adopted policies that caused levels of stock to decline through the 1920s.<sup>73</sup> The amount of sheep and goats

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64. See CLAWSON, *supra* note 14, at 63.

65. Forest Service receipts from grazing were 0.9% of total receipts in 1988, and 2.1% of receipts in 1993. See AGRICULTURAL STATISTICS, *supra* note 41, at XII-28 (1995-1996). BLM receipts from grazing amounted to 5% of total receipts in 1988, and 7.5% of total receipts in 1993. Compare PUBLIC LAND STATISTICS (1988), *supra* note 1, at 101, with PUBLIC LAND STATISTICS (1988), *supra* note 1, at 116.

66. See Perry R. Hagenstein, *The Federal Lands Today—Uses and Limits*, in RETHINKING THE FEDERAL LANDS, 74, 86 (Sterling Brubaker ed., 1984).

67. See *id.*

68. See Terry L. Anderson & Peter J. Hill, *The Evolution of Property Rights: A Study of the American West*, 18 J.L. & Econ. 163, 172-73 (1975).

69. See CLAWSON, *supra* note 14, at 63-64.

70. See Ed Marston, *The Old West is Going Under*, HIGH COUNTRY NEWS, Apr. 27, 1998, at 1.

71. See CLAWSON, *supra* note 14, at 64.

72. See *id.* at 65.

73. See *id.*

grazing on the National Forest System continued to decline over the next 60 years, resulting in an 85% drop from 1930 to the mid-1990s.<sup>74</sup> The quantity of cattle and horses experienced a gradual decline from the 1930s to the 1970s, reached a plateau during the mid-1970s, only to resume its decline in the 1980s through the 1990s. From a peak in 1976 to its level in 1995, the number of cattle, horses, and burros dropped by over 27%.<sup>75</sup>

Grazing on BLM lands followed a similar long-term decline. The Taylor Grazing Act of 1934 was enacted in response to domestic livestock overgrazing on public domain lands.<sup>76</sup> It authorized the Grazing Service, and later the BLM, to establish grazing districts and regulate the number of stock using the lands.<sup>77</sup> BLM measures all stock under a common animal unit month (AUM).<sup>78</sup> From the mid-1930s to the early-1940s, the number of AUMs increased with the number of grazing districts established under the new regulatory framework.<sup>79</sup> BLM grazing remained constant from the 1940s until the late 1950s, but then began a long-run decline in the early 1960s that lasted through the 1990s. By 1996, grazing had dropped over 45% from its peak level in 1955.<sup>80</sup> The general downward trend follow the net decline seen for grazing of all stock in the national forests.<sup>81</sup> Overall, livestock in the West is down from 20 million head in 1900 to less than 2 million in 1998.<sup>82</sup>

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74. Sheep and goat levels were approximately 6,714 thousand in 1930 and 940 thousand in 1995. Compare AGRICULTURAL STATISTICS (1951), *supra* note 41, with AGRICULTURAL STATISTICS (1997), *supra* note 41, at XII-28.

75. The number of cattle, horses, and burros grazing on the National Forests System lands amounted to 1,690 thousand in 1976 and 1,227 in 1995. After 1977, livestock data on cattle and horses includes burros. Compare AGRICULTURAL STATISTICS (1997), *supra* note 41, at XII-28, with AGRICULTURAL STATISTICS (1985), *supra* note 41, at 489.

76. See CLAWSON, *supra* note 14, at 67; Gates, *supra* note 17, at 52-53.

77. See 43 U.S.C. §§ 315 (1994); see also Nolen, *supra* note 31, at 784.

78. "Animal unit month" defines the quantity of forage needed to sustain a cow for a month. See PUBLIC LAND STATISTICS, *supra* note 1, at 131 (1993).

79. See CLAWSON, *supra* note 14, at 67.

80. The number of AUMs fell from 15,367 thousand in 1955 to 8,423 in 1996. Compare BUREAU OF LAND MGMT., DEP'T OF THE INTERIOR, REPORT OF THE DIRECTOR OF THE BUREAU OF LAND MGMT.: STATISTICAL APPENDIX 140 (1955), with PUBLIC LAND STATISTICS, *supra* note 1, at 62 (1996). See also MARION CLAWSON, THE FEDERAL LANDS SINCE 1956: RECENT TRENDS IN USE AND MANAGEMENT 67 (1967).

81. See CLAWSON, *supra* note 14, at 68.

82. Marston, *supra* note 70.



### 3. Minerals

#### a. Hardrock Mining

Mining was one of the first federally encouraged uses of public lands and an important factor in the development of the West.<sup>83</sup> Gold rushes in the middle of the nineteenth century attracted thousands of prospectors seeking their fortunes in California and Colorado.<sup>84</sup> Other minerals played a significant role in creating an industrial base of mining and associated metal manufacturing in many inland Western states.<sup>85</sup> Today, the development of energy and mineral resources on federal lands falls under four different statutory frameworks discussed below.<sup>86</sup>

The Mining Law of 1872 permits individuals who discover valuable minerals on public lands to extract these minerals under either an unpatented mining claim or a federal patent. An unpatented mining claim grants exclusive possession of the surface area, the right to remove minerals, and the right to sell them without payment of royalties to either the federal or state government.<sup>87</sup> Many mines operate on federal lands under unpatented mining claims because such claims provide sufficient protection for land and mineral interests and also offer certain tax advantages.<sup>88</sup> On the other hand, a patent grants the miner

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83. See generally JOHN D. LESHY, *THE MINING LAW: A STUDY IN PERPETUAL MOTION* 12 (1987).

84. See generally POWER, *supra* note 6; CARL UBBELOHDE ET AL., *A COLORADO HISTORY* 56-67 (7th ed., 1995).

85. Mining played a key role in the industrial bases of Arizona, New Mexico, Utah, Idaho, and Montana. See POWER, *supra* note 6, at 93-94.

86. The Mining Law of 1872 grants access to the mining of hardrock minerals on unreserved public domain lands and permits exclusive use of such land upon the discovery of minerals. 30 U.S.C. §§ 21-47 (1994). The Mineral Leasing Act of 1920 retains federal ownership of energy and fertilizer resources on federal lands and establishes a leasing system that requires private developers to pay royalties upon extracting the resource. 30 U.S.C. §§ 181-287 (1994). The Materials Act of 1947 governs the sale of commonly occurring mineral materials such as sand, stone, gravel, and clay. 30 U.S.C. §§ 601-604 (1994). Finally, various disposal laws granted land patents to private individuals but reserved the subsurface mineral rights to the federal government. These minerals are subject to the conditions of the applicable lease or sale. See Coal Lands Act of 1909, 30 U.S.C. § 81 (1994); Agricultural Entry Act of 1914, 30 U.S.C. § 121 (1994); Stock-Raising Homestead Act of 1916, 43 U.S.C. § 291-302 (repealed 1976, except §§ 299, 301); see also LATOS, *supra* note 20, at 374-77; Leshy, *supra* note 83.

87. See LATOS, note 20 at 384.

88. See Leshy, *supra* note 83, at 266-67; see also *Wilbur v. United States ex rel. Krushnic*, 280 U.S. 306, 317 (1930) ("[S]o long as [the claimant] complies with the provisions of mining laws, his possessory right, for all practical purposes of ownership, is as good as though secured by patent.").

full ownership in the form of a fee simple upon fulfilling various requirements.<sup>89</sup> Today, many hardrock mines in the West are on private lands transferred from the public domain under the patenting process.<sup>90</sup>

From 1880 to the turn of the century, each year more than 1,000 mining patents were issued.<sup>91</sup> After 1912, the number of patents dropped to several hundred per year, and by 1930 less than 200 per year were issued.<sup>92</sup> The number of patents issued fell during the 1960s and early 1970s, enjoyed a resurgence in the mid-1980s,<sup>93</sup> only to drop again in the 1990s to all-time low levels. By the late 1990s, due in part to a moratorium on patent issuance, the number of patents issued had dropped 96% from the level in 1960.<sup>94</sup>

The total of unpatented mining claims on federal lands is difficult to quantify. Prior to 1976, various studies estimated that there were approximately 6 million such claims.<sup>95</sup> The en-

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89. Applicant for a patent must be able to show compliance with requirements, which include discovery of a valuable mineral, existence of the mineral on land subject to mineral location, annual assessment work, compliance with recordation deadlines, and no adverse claimants. See LAITOS, *supra* note 20, at 384.

90. See Hagenstein, *supra* note 66, at 89 (citing U.S. OFFICE OF TECHNOLOGICAL ASSESSMENT, MANAGEMENT OF FUEL AND NONFUEL MINERALS IN FEDERAL LAND (1979)).

91. See Leshy, *supra* note 83, at 266.

92. See *id.*; see also Robert C. Anderson, *Federal Mining Policy: The General Mining Law of 1872*, 16 NAT. RESOURCES J. 601, 604 (1976).

93. Two spikes in an otherwise downward sloping curve for patent issuance in the 1980s are explained by the extraordinarily large number of patents for bentonite issued in 1983 (almost all within the state of Montana) and the Reagan Administration's decision in 1987 to settle quarter-century-old litigation challenging pre-1920 mining claims for oil shale, which resulted in a high number of oil shale patents issued that year. See, e.g., *Tosco Corp. v. Hodel*, 611 F. Supp. 1130 (D. Colo. 1985) (holding that the United States was estopped from asserting the validity of nearly 100 pre-1920 oil shale claims); PUBLIC LAND STATISTICS (1983), *supra* note 1, at 143 tbl.75; John D. Leshy, *Reforming The Mining Law: Problems and Prospects*, 9 PUB. LAND L. REV. 1, 8 (1988).

94. The number of mineral patents issued dropped from 168 in 1960 to 5 in 1996. Compare PUBLIC LAND STATISTICS (1960), *supra* note 1, with PUBLIC LAND STATISTICS (1996), *supra* note 1, at 99. Since 1994, BLM has issued no more than ten mining patents per year in part because of a moratorium on new mining patents. On September 30, 1994, Congress enacted an appropriation bill for the Department of Interior that placed a moratorium on the processing of mining or millsite patent applications and the issuing of patents under general mining laws. Department of the Interior and Related Agencies Appropriations Act, Pub. L. No. 103-332, 108 Stat. 2499 (1994). The Secretary of the Interior, Bruce Babbitt, issued an Instruction Memorandum that interpreted the statute to halt the processing of pending claims. Bruce Babbitt, Dep't of the Interior, Instruction Memorandum No. 95-01 (Oct. 4, 1994). In a subsequent court challenge, the Tenth Circuit held that the Secretary improperly discontinued the processing of a mining company's application. See *Mt. Emmons Mining Co. v. Babbitt*, 117 F.3d 1167 (10th Cir. 1997).

95. See generally LESHY, *supra* note 83, at 82.

actment of FLPMA in 1976 created a new federal recording system that was intended to identify legitimate unpatented claims and eliminate abandoned or inactive mining claims.<sup>96</sup> By 1996, this FLPMA provision resulted in the administrative closing of more than 2 million claims because of either abandonment or the failure to document an effort to develop the claim.<sup>97</sup> Numerous investigations suggested that many of these claims had been used for nonmining purposes or otherwise abandoned.<sup>98</sup> If one tracks the number of unpatented mining claims recorded under FLPMA, the number rose above the 1.2 million mark for most of the 1980s as claims were being recorded, but then significantly dropped in the 1990s. By 1996, unpatented claims fell to 0.3 million, a 75% drop over 10 years.<sup>99</sup> The overall reduction in patents and unpatented claims is reflected in a decline in the number of operating hardrock mines in the West from 3,300 in 1954, to about 1,000 in the late 1990s.<sup>100</sup>

#### b. *Energy Minerals*

Energy development on federal lands has been pursued under the Mineral Leasing Act of 1920.<sup>101</sup> Oil and gas leasing on public domain lands was relatively insignificant during the 1920s and 1930s.<sup>102</sup> After World War II, the number of leases shot up from just over 5,000 to reach 140,000 by 1960. Following this increase, the number of leases fell until the mid-1960s, gradually rose during the "energy crisis" of the 1970s, and peaked in the early 1980s. During the remainder of the 1980s and into the 1990s, however, the number of oil and gas leases has experienced a downward slide. The 1996 level of leases on the public domain represents a 71% drop from the peak 1960

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96. See generally LESHY, *supra* note 83, at 81; LATOS, *supra* note 20, at 397.

97. The cumulative number of claims closed, forfeited, or voided in 1996 was 3,043,245. This figure was derived from the 1993 cumulative number plus the annual number closed for the years 1994-96. See PUBLIC LAND STATISTICS (1993), *supra* note 1, at 94; PUBLIC LAND STATISTICS (1994), *supra* note 1, at 194; PUBLIC LAND STATISTICS (1995), *supra* note 1, at 199; PUBLIC LAND STATISTICS (1996), *supra* note 1, at 100.

98. See generally LESHY, *supra* note 83, at 55-77.

99. Unpatented claims of record were 1.214 million in 1986 and .307 million in 1996. Compare PUBLIC LAND STATISTICS (1986), *supra* note 1, at 78, with PUBLIC LAND STATISTICS (1996), *supra* note 1, at 100.

100. See Chilson, *supra* note 9, at 12. This decrease in the number of mines is explained in part by a general increase in the size of mines coupled with a diminution in the quantity of mineral resources remaining in the earth.

101. 30 U.S.C. §§ 181-287 (1994).

102. See CLAWSON, *supra* note 14, at 87.

level.<sup>103</sup>

This downward trend of oil and gas activity on public lands is also evidenced by the decline in drilling activity. "Applications for permit to drill" (APDs), "new holes started," and "producibile completions" have all dropped since the 1980s.<sup>104</sup> The number of producibile completions, the indicator of a successful drilling effort, rose during the late 1980s, but has since declined in the mid-1990s. As of 1996, producibile completions dropped 63% from its peak in 1992.<sup>105</sup> There has been a commensurate decline in the amount of petroleum produced from public lands. The number of barrels of oil produced from these lands has fallen from 201.5 million in 1970, to 144 million in 1980, then to 126.7 million in 1993, and to 121.5 million in 1996.<sup>106</sup>

The number of federal coal leases on public lands remained relatively low from the 1920s through 1960.<sup>107</sup> Anticipation of tightening energy markets prompted coal companies and other energy speculators to seek rights to coal on federal lands.<sup>108</sup> This period saw a rise in the number of coal leases from around 300 to over 500 leases in the mid-1970s. Coal leases subsequently peaked above the 600 level in the early 1980s, but since the mid-1980s has steadily dropped. The 1996 level of coal leases was 36% lower than its peak level in 1983.<sup>109</sup>

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103. The number of oil and gas leases on public domain lands dropped from 139,500 in 1960 to 40,711 in 1996. Compare HISTORICAL STATISTICS, *supra* note 18, at 432, with PUBLIC LAND STATISTICS (1996), *supra* note 1, at 67-78. In 1997, a consortium of oil and gas trade and professional associations, through the American Association of Professional Landmen, conducted a study inventorying and classifying federal lands in eight western states to show their availability for oil and gas exploration and development. The study found that 32.6 million acres (less than 17% of total federal mineral estate) were under lease in 1997, compared with 114 million acres (72%) in 1983. See COOPERATING ASSOCIATIONS FORUM, FEDERAL LAND ACCESS TO OIL AND GAS MINERALS IN EIGHT WESTERN STATES 15 (1997).

104. See PUBLIC LAND STATISTICS (1985-1996), *supra* note 1.

105. There were 8,500 wells on public and private lands in 1983, and 1,900 wells in 1996. See Chilson, *supra* note 9. By 1998, that number had fallen to just over 1000. See *Hard Work If You Can Get It*, N.Y. TIMES, July 8, 1998, at C1. Producibile completions fell from 2,213 in 1992, to 824 in 1996. Compare PUBLIC LAND STATISTICS (1992), *supra* note 1, at 76, with PUBLIC LAND STATISTICS (1996), *supra* note 1, at 83. See also COOPERATING ASSOCIATIONS FORUM, *supra* note 103, at 7 (noting that between 1983 and 1997, access to oil and gas reserves on public lands in eight western states declined by more than 60%).

106. See PUBLIC LAND STATISTICS (1970), *supra* note 1, at 105; PUBLIC LAND STATISTICS (1980), *supra* note 1, at 98.

107. See CLAWSON, *supra* note 14, at 93.

108. See *id.*

109. Coal leases on federal lands dropped from 611 in 1983 to 389 in 1996. Compare STATISTICAL ABSTRACT 1990, *supra* note 58, at 328, with PUBLIC LAND STATISTICS (1996), *supra* note 1, at 86.

What is striking about this downward trend among commodity uses is that it is relentless and pervasive among all the traditional economic resources. There has been a decline in timber harvesting, grazing, hardrock mining, and extraction of energy minerals from public lands. Moreover, the trend has not slowed in recent years, it has accelerated. To fully understand the scope of change, one should compare this slide with the rise of recreation and preservation.

### *C. The Growth of Recreation and Preservation Uses On Public Lands*

Recreation and preservation have been the fastest growing uses of public lands in the late twentieth century and arguably are now the dominant uses of federal lands. The growth of recreation and preservation on public lands is analyzed below on two levels. First, data from the relevant federal agencies show a dramatic increase in recreational visitors to public lands over the last several decades. Second, a review of the statutes governing uses on public lands throughout the twentieth century shows a large increase in lands set aside for recreation and/or preservation and a corresponding decrease in public lands available for commodity extraction.

This change from lands that were commodity-based to lands that are now recreation and preservation-based is reflected in basic economics. The hundreds of billions of dollars spent each year on outdoor recreation has surpassed mining, timber harvesting, and grazing as an economic force on Western public lands.<sup>110</sup> The Secretary of Agriculture has recognized that of the \$130 billion that the national forests will contribute to the national economy by the year 2000, nearly \$100 billion will come from recreation.<sup>111</sup>

#### *1. The Rise of Recreational Visitors*

Although the major land management agencies all provide recreational opportunities, they operate under distinct mandates and collect recreational data in different forms. Most rely on visits to public lands. Because of the difficulty in aggregating the recreation data of different agencies, some caution is therefore

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110. See Jon Margolis, *The Latest 1,000-Pound Gorilla*, HIGH COUNTRY NEWS, Apr. 27, 1998, at 15.

111. See *id.*

required.<sup>112</sup>

Recreation has surged in the National Forest System during the post-World War II era. From 1924 to 1964, the Forest Service measured recreation in terms of visits. After 1966, it adopted the visitor-day unit in order to differentiate the duration of particular visits. A visitor day defines recreational use in aggregates of twelve hours. The 1995 level of 345 million visitor days on National Forest lands represents a 1,161% increase since 1950, and a 100% increase since 1970.<sup>113</sup> By 1999, the number of visitor days is expected to double the 1995 level to over 800 million.<sup>114</sup>

The available recreation data for BLM lands is more difficult to interpret because of a change in the units of measure and the BLM's difficulty in consistently reporting recreation uses over its vast amount of land. Although the BLM reported visits from 1964 to 1992, it discontinued the practice in 1993 pending the implementation of a new, more accurate, reporting system.<sup>115</sup> From 1964 to 1981, the BLM followed the Forest Service practice of reporting recreation in terms of visitor-days, but then switched to a visitor-hours unit of measure in 1982.<sup>116</sup> One can convert BLM's visitor hours to visitor days simply by dividing by twelve, since one visitor day is equal to twelve visitor hours.<sup>117</sup> Using such a conversion, visitor-days on BLM lands increased 341% between 1964 and 1981.<sup>118</sup> The discontinuity between the former and adjusted visitor-day measures probably reflects structural changes in BLM's techniques for measuring recreation. Looking at the data from 1982, BLM's adjusted visitor-days rose

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112. See U.S. GENERAL ACCOUNTING OFFICE, *PARK SERVICE: MANAGING FOR RESULTS COULD STRENGTHEN ACCOUNTABILITY* 22 tbl.II.1 (1997) (noting that "[c]aution must be used in interpreting data on visitation when making comparisons across agencies").

113. The Forest Service counted 27,368 thousand visits in 1950, 172,555 thousand visits in 1970, and 345,083 thousand visits in 1995. Compare *AGRICULTURAL STATISTICS* (1952), *supra* note 41, at 790, with *AGRICULTURAL STATISTICS* (1971), *supra* note 41, at 580, with *AGRICULTURAL STATISTICS* (1997), *supra* note 41, at XII-30. By comparison, the population of the United States registered a 63% increase between 1950 and 1990, and a 35% increase between 1970 and 1990. See *STATISTICAL ABSTRACT*, *supra* note 58, at 8. The rise in recreational use is therefore not merely explained by national population increases.

114. See Kit Miniclier, *Sky's Not the Limit: Forests Alive With Sounds of Tourists*, DENVER POST, Aug. 2, 1998, at B1.

115. See *PUBLIC LAND STATISTICS* (1993), *supra* note 1, at 52.

116. See *PUBLIC LAND STATISTICS* (1982), *supra* note 1 at 76.

117. See CHARLES I. ZINSER, *OUTDOOR RECREATION: UNITED STATES NATIONAL PARKS, FORESTS, AND PUBLIC LANDS* 553 (1995).

118. BLM visitor days rose from 14.477 million in 1964, to 63.825 million in 1981. Compare *PUBLIC LAND STATISTICS* (1964), *supra* note 1, at 73, with *PUBLIC LAND STATISTICS* (1981), *supra* note 1, at 71.

176% from 1982 to 1996.<sup>119</sup>

Other major land management agencies also show large increases in recreation use. For example, the National Park Service has recorded recreational visits since 1904. Prior to the 1940s, total visits never exceeded 20 million and temporarily dropped during World War II.<sup>120</sup> Since the early 1950s, however, the number of visits has been rising at a steady rate. The 1995 visitation level of nearly 270 million visits per year represents a 711% increase since 1950, and a 57% increase since 1970.<sup>121</sup> Among the various components of the National Parks System, National Parks attracted 23% of the total visits in 1994, followed by National Recreation Areas with 19%, National Historic Parks with 9%, and National Monuments with just under 9%.<sup>122</sup> The Fish and Wildlife Service reports a 21.3% increase in visits to its lands from 1985 to 1996.<sup>123</sup> Visits to facilities operated by the Army Corps of Engineers rose 23% from 1986 to 1996.<sup>124</sup> The Bureau of Reclamation also experienced a 36.1% rise in visitor-day units at its reservoirs and project lands over the period covering 1980 to 1990.<sup>125</sup>

## 2. *The Rise in Recreation and Preservation Pursuant to Statutory Mandates*

At the turn of the century, the conservation movement mobilized enough political strength to institutionalize the national park concept in the National Park Service Organic Act of 1916.<sup>126</sup>

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119. BLM adjusted visitor-days increased from 26,213 thousand (316,959 thousand visitor hours) in 1982 to 72,793 thousand (873,524 thousand visitor hours) in 1996. Compare PUBLIC LAND STATISTICS (1982), *supra* note 1, at 76, with PUBLIC LAND STATISTICS (1996), *supra* note 1, at 123.

120. See HISTORICAL STATISTICS, *supra* note 18, at 396.

121. National Park Service recreation visits were 33 million visits in 1950 and 270 million visits in 1995. See Jan G. Laitos, *National Parks and the Recreation Resources*, 74 DENV. U. L. REV. 847, 851 (1997).

122. National Park System recreational visits in 1994 broke down as follows: Total, 268,636,169; National Parks, 62,984,052; National Recreation Areas, 52,309,921; National Historical Parks, 23,860,116; and National Monuments, 23,563,779. See NATIONAL PARK SERVICE, NATIONAL PARK SERVICE STATISTICAL ABSTRACT 2 (1994).

123. Fish and Wildlife Service visits rose from 24 million in 1985, to 29.1 million in 1996. See MANAGING FOR RESULTS, *supra* note 112, at 22.

124. Corps of Engineer visits increased from 172.3 million in 1986 to 211.9 million in 1996. See *id.*

125. See BUREAU OF RECLAMATION, DEPT OF THE INTERIOR, 1990 SUMMARY STATISTICS: WATER, LAND, AND RELATED DATA 11 (1990).

126. 16 U.S.C. §§ 1-18f (1994); see also Shutkin, *supra* note 36. The National Park System began with the creation of Yellowstone as the first national park in 1872. Act of March 1, 1872, 17 Stat. 32 (codified as 16 U.S.C. §§ 21-40 (1994)); see

The Organic Act sets forth the Park Service's dual, and sometimes conflicting, mandate to provide for recreational use, while at the same time preserving resources "unimpaired for the enjoyment of future generations."<sup>127</sup> Today, the 75 million acre National Park System<sup>128</sup> encompasses 54 National Parks covering 48 million acres,<sup>129</sup> including national monuments,<sup>130</sup> historic parks and sites, recreation areas, parkways, and seashores.<sup>131</sup>

In 1940, an executive order created the Fish and Wildlife Service (FWS) by merging the Bureau of Fisheries of the Commerce Department with the Division of Biological Survey of the Department of Agriculture.<sup>132</sup>

Wildlife refuges administered by FWS have also become an increasingly important preservation and recreation resource on federal lands in the twentieth century. Acts initiated by Congress and the Executive Branch resulted in the formation of the modern National Wildlife Refuge System (NWRS).<sup>133</sup> The National Wildlife Refuge System Administration Act of 1966<sup>134</sup> defined refuges as a "system"<sup>135</sup> and became the organic act by which the

also Gates, *supra* note 17, at 48.

127. 16 U.S.C. § 1 (1994).

128. "National Park System" is defined as "any area of land and water now or hereafter administered by the Secretary of the Interior through the National Park Service for park, monument, historic, parkway, recreational, or other purposes." *Id.* § 1(c)(a) (1994).

129. See STATISTICAL ABSTRACT, *supra* note 58, at 250.

130. See Antiquities Act of 1906, 16 U.S.C. §§ 431-433 (1994).

131. See PARK SERVICE STATISTICAL ABSTRACT, *supra* note 122, at 2.

132. The Bureau of Fisheries and the Bureau of Biological Survey were shifted to the Department of the Interior under Reorganization Plan No. 2 of 1939, §§ 3(e), 3(f), 53 Stat. 1431, 1433-34 (1939). The two bureaus were merged into the FWS by Reorganization Plan No. 3 of 1940, § 3, 54 Stat. 1231, 1232 (1940). The Fish and Wildlife Act of 1956 gave the FWS authority to take action to conserve fish and wildlife, including acquiring land and water areas. Act of Aug. 8, 1956, ch. 1036, § 3, 70 Stat. 1119, 1120 (1956) (current version codified at 16 U.S.C. § 742b (1994)). See generally Richard J. Fink, *The National Wildlife Refuges: Theory, Practice, and Prospect*, 18 HARV. ENVTL. L. REV. 1, 39, 39 n.261-62 (1994).

133. In 1903, President Roosevelt established the Pelican Island National Wildlife Refuge to protect herons and egrets from over hunting. In 1905 and 1906, Congress granted the President authority to designate a wildlife range for bison and Texas longhorn in the Wichita National Forest and the Grand Canyon National Forest. The Migratory Bird Treaty Act of 1918 prompted refuge actions protecting migratory birds in North America from over-hunting. The Migratory Bird Conservation Act of 1929 authorized land acquisition to comply with the Migratory Bird Treaty Act of 1918. Federal acquisitions of land for refuges have largely been financed by two sources, The Migratory Bird Hunting Stamp Act of 1934 and the Land and Water Conservation Fund Act of 1964. See Fink, *supra* note 132, at 10-18.

134. Pub. L. No. 89-669, 80 Stat. 926 (1966) (amended as the National Wildlife Refuge Administration, current version codified as 16 U.S.C. §§ 668dd-668ee (1994)).

135. 16 U.S.C. § 668dd(a)(1) (1994).



FWS administered the refuge system.<sup>136</sup> This Act articulated the primary goal of the NWRS as the preservation of wildlife, although it permitted other "compatible" uses at the agency's discretion.<sup>137</sup> It also established recreation as a secondary objective,<sup>138</sup> incorporating the 1962 Refuge Recreation Act,<sup>139</sup> which called for recreational use of the NWRS compatible with wildlife conservation.<sup>140</sup> The NWRS expanded approximately 475% from 1960 to 1996.<sup>141</sup> In 1980 alone, the passage of the Alaska National Interest Lands Conservation Act<sup>142</sup> added 53.7 million acres, tripling the size of the NWRS.<sup>143</sup> Since the Alaska addition in 1980, there has been a 21.5% total increase in the number of NWRS reserves as of 1996.<sup>144</sup> Overall, by 1996 the NWRS covered 92.6 million acres and consisted of 509 National Wildlife Refuges, 193 Waterfowl Protection Areas, and 50 Coordination Areas.<sup>145</sup>

The Wilderness Act of 1964<sup>146</sup> signaled a heightened commitment to preservation, setting in motion a process that has transferred millions of acres from extractive uses to recreation and the preservation of wildlife habitat.<sup>147</sup> The Act defines wilderness as an area where "the earth and its community of life are untrammelled by man," where the land retains its "primeval character" and has "been affected primarily by the forces of nature."<sup>148</sup> Wilderness areas generally restrict the building of roads and structures, commercial development, and the operation of

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136. See Fink, *supra* note 132, at 25.

137. 16 U.S.C. § 668dd(d)(1)(A) (1994); see also Fink, *supra* note 132, at 27.

138. 16 U.S.C. § 668dd(h) (1994); see also Fink, *supra*, note 132, at 25.

139. Pub. L. No. 87-714, 76 Stat. 653 (1962) (current version codified at 16 U.S.C. §§ 460k to 460k-4 (1994)).

140. "[T]he Secretary of the Interior is authorized, as an appropriate incidental or secondary use, to administer such areas or parts thereof for public recreation when in his judgment public recreation can be an appropriate incidental or secondary use . . . ." 16 U.S.C. § 460(k) (1994).

141. The Total Refuge System (National Wildlife Refuges, Waterfowl Protection Areas, and Coordination Areas) consisted of 92.644 million acres in 1996. See U.S. Fish and Wildlife Service, Annual Report of Lands Under the Control of the U.S. Fish and Wildlife Service 4 (1996). The Fish and Wildlife Service controlled 16,016 thousand acres in 1960. See PUBLIC LAND STATISTICS, *supra* note 1 (1960).

142. Pub. L. No. 96-487, 94 Stat. 2371 (1980) (codified in part at 16 U.S.C. §§ 3101-3133 (1994)).

143. See Fink, *supra* note 132, at 30-31.

144. Total Refuge System rose from 619 units in 1980, to 752 units in 1996. See FWS Annual Report, *supra* note 141.

145. See *id.*

146. Pub. L. No. 88-577, 78 Stat. 890 (codified at 16 U.S.C. §§ 1131-1136 (1994)).

147. See 2 COGGINS & GLICKSMAN, *supra* note 2, §§ 14B.01 through 14B.02.

148. 16 U.S.C. § 1131(c) (1994).

motorized vehicles.<sup>149</sup> Created by congressional acts,<sup>150</sup> they are managed by the agencies that had previous jurisdiction over the land.<sup>151</sup> The entire National Wilderness Preservation System has grown from the 9.1 million acres originally designated in the 1964 Wilderness Act to over 96 million acres.<sup>152</sup> Wilderness areas in Forest Service and BLM lands impose significant restraints on traditional extractive uses that otherwise would be managed under multiple-use principles. By 1994, wilderness areas amounted to 34.6 million acres of Forest Service lands and 1.7 million acres of BLM lands.<sup>153</sup>

Despite these changes of use, both the Forest Service and BLM have moved slowly (and reluctantly) to tailor their management philosophies to reflect the dominance of recreation and preservation use on their lands. These two public land agencies still adhere to their original multiple-use mandate, despite that mandate's increasing irrelevance. Gifford Pinchot, the first director of the Forest Service, gave scarce recognition to recreation,<sup>154</sup> and for many years, the Forest Service deemed its primary responsibility to be the harvesting of the timber.<sup>155</sup> The Supreme Court ratified this belief, interpreting the Forest Service's 1897 Organic Act as specifying only two multiple-use purposes: timber production and watershed protection.<sup>156</sup> It was not until 1960 that Congress first instructed the Forest Service to include both outdoor recreation and wildlife and fish preservation in its multiple-use management.<sup>157</sup> The National Forest Man-

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149. The Wilderness Act, however, embodies political compromises creating several exceptions to the general restriction on commodity extraction. The three key exceptions are timber cutting for control of fire, insects, and diseases, 16 U.S.C. § 1133(d)(1) (1994); a twenty-year grace period for some types of mining, 16 U.S.C. § 1133(d)(3) (1994); and grandfathering of grazing uses prior to 1964, 16 U.S.C. § 1133(d)(4) (1994).

150. 16 U.S.C. § 1131(a) (1994).

151. 16 U.S.C. § 1131(b) (1994).

152. See ZINSER, *supra* note 117, at 635. Designated wilderness on Forest Service lands in 8 western states increased by almost 9 million acres, or 100%, since 1983. See COOPERATING ASSOC. FORUM, *supra* note 103, at 15.

153. See ZINSER, *supra* note 117, at 635.

154. Although most data on Forest Service activities dates back to 1905, the Forest Service did not begin collecting and publishing recreation data until 1924. See CLAWSON, *supra* note 14, at 34.

155. See, e.g., GEORGE CAMERON COGGINS ET AL., FEDERAL PUBLIC LAND AND RESOURCES LAW 662 (3d ed. 1993) ("Commercial timber is the most valuable commodity resource in the National Forest System. The operations of most Forest Service field offices are effectively organized around the allowable cut.").

156. See *United States v. New Mexico*, 438 U.S. 696 (1978).

157. See Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. §§ 528-531 (1994).

agement Act of 1976<sup>158</sup> reiterated Congress' intent that recreation and wildlife preservation should be included in the multiple uses on Forest Service land.<sup>159</sup>

Similar to the Forest Service, the BLM's historic roots were closely tied to traditional commodity uses—grazing, mining, and timber.<sup>160</sup> In 1964, Congress first authorized the BLM to manage with a multiple-use mandate.<sup>161</sup> In that same year, the BLM started including recreation data in its annual reports.<sup>162</sup> In 1976, FLPMA required BLM to adopt a multiple-use management philosophy with recreation, wildlife preservation, and aesthetics as statutorily mandated uses.<sup>163</sup>

## II

### FACTORS CAUSING FUNDAMENTAL CHANGES IN PUBLIC LAND USE

Part I showed that commercial commodity development of public lands has been declining in relative importance, while use of these lands for recreation and preservation has become predominant.<sup>164</sup> Before examining how the relevant federal agencies have failed to cope with this fundamental change in Part III, Part II explores the reasons behind the reduction in commercial uses of public lands and the rise in use of these lands for recreational and preservationist purposes.

#### A. *The Declining Commercial Role of Natural Resources on Public Lands*

Several economic and legal factors have caused the commercial potential of natural resources on public lands to decline. These factors include: (1) inadequate profitable returns on extractive uses of public land resources; (2) a marketplace demand shift away from raw materials extraction that reflects a higher value placed upon a broad range of services, recreational opportunities, and non-use preservationist values; and (3) a legal

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158. 16 U.S.C. §§ 1600-1614 (1994).

159. 16 U.S.C. § 1607 (1994).

160. See generally Nolen, *supra* note 31, at 836.

161. Act of Sept. 19, 1964, Pub. L. No. 88-607, 78 Stat. 986 (1964) (repealed 1970).

162. See PUBLIC LAND STATISTICS, *supra* note 1, (1964); see also CLAWSON, *supra* note 14, at 291.

163. 43 U.S.C. § 1702(c) (1994).

164. Noncommercial, nonextractive uses of public lands encompass outdoor recreational opportunities, as well as preservationist values bound up with clean air and water, biodiversity, healthy and intact ecosystems, wilderness areas, habitat protection for wildlife, and scenic beauty.

structure that encourages noncommercial, nonextractive uses of public lands to compete with (and now dominate) traditional extractive uses of these lands.

### 1. *Domestic Industries Do Not Rely On Public Lands For Natural Resources*

The products of several American industries, such as the construction, manufacturing, electrical, plumbing, and agricultural industries, rely on natural resources. If industries dependent on natural resources used only minerals, timber, and forage found on public lands, such lands would be quite valuable as a supply source. These industries would also likely locate at, or near, the source of these commodities and stimulate local economies with payrolls and local purchases. In the Rocky Mountain West, where most public lands are located, however, there has been a general decline in employment and income associated with the extraction of commodity resources. In 1969, over 11% of all direct employment and 9.6% of personal income came from natural resources industries. By 1991, these industries represented less than 6% of all employment and less than 5% of all personal income.<sup>165</sup>

This trend is partially the result of decisions by companies either to abandon altogether the United States (and its public lands) as a source of supply,<sup>166</sup> or to rely on private, nonfederally owned resources.<sup>167</sup> With fewer resource-dependent corporations finding their supply of natural resources on public lands, local communities near these lands have had to become less economi-

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165. See Raymond Rasker, *A New Look at Old Vistas: The Economic Role of Environmental Quality in Western Public Lands*, 65 U. COLO. L. REV. 369, 377 (1994) (citing BUREAU OF ECON. ANALYSIS, U.S. DEPT OF COMMERCE, REGIONAL ECONOMIC INFORMATION SYSTEM: FULL AND PART-TIME EMPLOYMENT AND INCOME BY INDUSTRY (1992)); COOPERATING ASSOC. FORUM, *supra* note 103, at 7 (noting that industry employment in the petroleum and natural gas extraction sector dropped by almost 50% between 1983 and 1997).

166. This shift away from domestic sources of supply has perhaps been most pronounced with respect to minerals, where private companies are increasingly tapping foreign sources of hard rock minerals, oil, and natural gas. See generally Robert Block, *Taking Sides: As Zaire's War Rages, Foreign Businesses Scramble for Inroads: Mining Firms Want a Piece of Vast Mineral Wealth*, WALL ST. J. EUROPE, Apr. 15, 1997, at 1; James Brooke, *For U.S. Miners, The Rush Is On to Latin America*, N.Y. TIMES, at C9.

167. Timber and grazing interests depend on nonfederal lands to supply a majority of their harvestable timber and feed for livestock. See, e.g., Keith Schneider, *House and Senate Agree to Raise Fees for Grazing on Federal Land*, N.Y. TIMES, Oct. 8, 1993, at A-27; Timothy Egan, *Wingtip 'Cowboys' in Last Stand to Hold On to Low Grazing Fees*, N.Y. TIMES, Oct. 29, 1993, at A1.

cally dependent on extractive industries. Although the specific reasons behind the dwindling presence of commodities industries on public lands vary by commodity, the consequence is the same for the communities near these lands. That is, their economies are not being driven by the extraction of natural resources.

a. *Timber*

The primary commodity use of Forest Service lands, logging, does not yield enough revenue after costs to generate net profits to the federal landowner. The White House Council of Economic Advisors has concluded that harvests on national forests cost more money than they make. A White House report showed that for the fiscal year ending September 30, 1995, the Forest Service collected \$616 million in receipts from timber sales, but spent more than \$850 million on timber management, reforestation, logging roads, payments to states, and other costs.<sup>168</sup> Such figures reveal that the Forest Service's logging operations do not turn a profit; instead, this federal agency is effectively subsidizing timber extraction from public lands by collecting less in timber sale revenues than it is spending on timber program costs.<sup>169</sup>

The modest, if not insignificant, contribution of the Forest Service's timber commodity to the nation's economy is evidenced by the fact that the major commercial users of Forest Service timber, the wood products industry, represent only 3% of the Gross National Product.<sup>170</sup> By the late 1990s, logging levels across the 192 million acres of national forests were just one fourth of the peak harvest levels of 12 billion board feet annually of the 1980s.<sup>171</sup> Moreover, the federal government does not control sufficient timber commodity resources on its public lands to

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168. See Scott Sonner, *Council Agrees Taxpayers Lose Money on U.S. Logging*, THE COLUMBIAN, Feb. 19, 1997, at Section A.

169. One important component of the federal timber subsidy is the cost of building logging roads in national forests, typically paid for with taxpayer money. The cost of building such roads is increasingly cited as the reason that many national forests lose money on timber sales. See Carey Goldberg, *Sylvan Roads That Lead to Bitter Protests*, N.Y. TIMES, May 23, 1997, at A14; see also *Timber Sales Lose Money*, DENVER POST, Jan. 8, 1998, at 3B (noting that the Forest Service's commercial logging programs lost \$204 million in 1996); *Cut the Cutting*, WASH. POST, Aug. 19, 1997, at A12.

170. See Daniels, *supra* note 7, at 486.

171. See Scott Sonner, *100-Year-Old Logging Law Draws Fire From 2 Sides*, ROCKY MOUNTAIN NEWS, June 5, 1997, at 53A. Potential timber sales of 100 million board feet of timber will be lost in the late 1990s because of a moratorium on new road building in most national forests. See Todd Wilkinson, *Forest Service Seeks a New (Roadless) Road to the Future*, 30 HIGH COUNTRY NEWS, Apr. 27, 1998, at 9.

affect, by the sale of its timber, the distribution of monetary wealth at an aggregate level.<sup>172</sup>

*b. Forage from Federal Rangeland*

The federal grazing permit also represents a sizable subsidy to private concerns, by allowing federal permittees to graze livestock for as little as a tenth of the cost a nonpermittee rancher must bear.<sup>173</sup> This subsidy is reflected in the fee ranchers pay for grazing privileges on federal lands, which is far below fair market value for the use of comparable grazing lands.<sup>174</sup> The below-cost federal grazing fee has thwarted BLM attempts to institute a range improvement program that would increase the forage-producing capacity of grazing allotments. Whenever such proposals involve even temporary reductions in the number of livestock allowed under a permit, permittees are inclined to fight the proposals for fear that the reductions will limit their commensurate rights, thereby lowering the base value of their ranches.<sup>175</sup>

The subsidy inherent in the fee for grazing on public lands contributes significantly to the deterioration of range conditions. When permittees maintain more animals than carrying capacity allows, the public rangeland becomes less productive.<sup>176</sup> Thus, it is not surprising that federal rangeland accounts for only 2 to 5% of the livestock produced in the United States as a whole.<sup>177</sup>

*c. Minerals*

The 1872 General Mining Law<sup>178</sup> permits exploration, private ownership, and removal of hardrock minerals on public domain lands. Since its passage in 1872, its operative scope has greatly diminished as federal reservation policies, private settlement,

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172. See Daniels, *supra* note 7, at 486.

173. See COGGINS & GLICKSMAN, *supra* note 2, § 19.02[2].

174. See, e.g., FEDERAL PUBLIC LAND AND RESOURCES LAW, *supra* note 155, at 702-04 (3d ed. 1993); DENZEL FERGUSON & NANCY FERGUSON, SACRED COWS AT THE PUBLIC TROUGH, ch. 16 (1983).

175. See generally Nolen, *supra* note 31; Richard H. Cowart and Sally K. Fairfax, *Public Lands Federalism: Judicial Theory and Administrative Reality*, 15 *ECOLOGY L.Q.* 375, 378-80 (1988); George Cameron Coggins, *Livestock Grazing on the Public Lands: Lessons From the Failure of Official Conservation*, 20 *GONZ. L. REV.* 749, 758 (1985).

176. See, e.g., NRDC v. Hodel, 624 F. Supp. 1045 (D. Nev. 1985), *aff'd*, 819 F.2d 927 (9th Cir. 1987) (discussing grazing allotments and the maintenance or improvement of ecological condition).

177. See generally DEPARTMENT OF THE INTERIOR & DEPARTMENT OF AGRICULTURE, STUDY OF FEES FOR GRAZING LIVESTOCK ON FEDERAL LANDS (1977).

178. 30 U.S.C. §§ 22-47 (1994).

and withdrawals have reduced the acreage of lands in the public domain open to mineral entry.<sup>179</sup> Congress has removed several varieties of valuable minerals from its operation.<sup>180</sup> Environmental considerations have greatly burdened a miner's access to minerals otherwise subject to the liberal ownership terms of the General Mining Law.<sup>181</sup> Also, many investors have decided that real assets, such as natural resources in general, and hard rock minerals in particular, are no longer good places to invest for high returns. In the 1990s, this shift away from investments in minerals can be explained by low inflation rates and high yields for noncommodity stock market portfolios.<sup>182</sup> Over the long run, it may be explained by declining prices for mineral resources.<sup>183</sup>

Energy resources, like oil and gas, that are found on shore in federal lands are buffeted by three realities that work to deter interest in domestic extraction of these resources. First, domestic oil on public lands cannot easily compete with the relatively cheap and plentiful supply from foreign nations.<sup>184</sup> Oil from the Persian Gulf is expected eventually to supply 3 out of every 4 barrels of new oil demand, reducing the need for domestic production and causing net imports from foreign sources to increase from 8 to over 10 million barrels per day by the year 2010.<sup>185</sup> New and planned Canadian gas pipelines may inundate the Midwest and Eastern United States with significant new gas supplies by the end of the century. One result of this unprecedented gas-on-gas competition will be lower wellhead prices for domestic gas from public lands.

Foreign competition is not the only deterrent to oil and gas exploration and development on public lands. Because oil and gas producers on federal lands are lessees that must pay royal-

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179. See COGGINS & GLICKSMAN, *supra* note 2, §§ 25.02[1] through 25.02[2].

180. See Mineral Leasing Act of 1922, 30 U.S.C. §§ 181-287 (1994).

181. See generally *Dunn McCampbell Royalty Interest, Inc. v. National Park Service*, 964 F. Supp. 1125 (S.D. Tex. 1995); Philip F. Schuster, II, & Roger F. Dierking, *Future Prospects for Mining and Public Land Management: The Federal "Retention-Disposal" Policy Enters the Twenty-First Century*, 26 ENVTL. L. 489 (1996).

182. See *Low Interest Rates Fuel Surging Stock Market*, DENVER POST, July 16, 1997, at A1.

183. See Margaret E. Slade, *Trends in Natural-Resource Commodity Prices: An Analysis of the Time Domain*, 9 J. ENVTL. ECONOMICS & MANAGEMENT 122 (1982).

184. See Matthew L. Wald, *U.S. Increasing Its Dependence On Oil Imports*, N.Y. TIMES, Aug. 10, 1997, at D10 ("American production is declining because it is easier to obtain oil from other countries than from the dwindling reserves in the United States.").

185. See ENERGY INFORMATION AGENCY, DEP'T OF ENERGY, ANNUAL ENERGY OUTLOOK (1996). Imports of oil have increased by 100% since 1983, increasing from 1.8 billion barrels to 3.5 billion barrels in 1996. See COOPERATING ASSOCIATIONS FORUM, *supra* note 103, at 16.

ties on their leases to the federal owner, they are subjected to royalty valuation problems. Unlike those due to lessors under private oil and gas leases, royalties under federal oil and gas leases must be calculated consistent with various federal statutory and regulatory regimes.<sup>186</sup> As a result, the ultimate profit to private oil and gas lessees may be substantially reduced if royalties are determined by valuation procedures that tend to maximize revenue to the United States. The Department of Interior's Mineral Management Service has been experimenting with valuation methods that move the point of valuation far away from the lease.<sup>187</sup> This policy could simultaneously increase the royalty due the United States, exacerbate the already considerable financial uncertainty inherent in planning whether to develop onshore federal oil and gas, and thereby decrease the desirability of oil and gas production on public lands.

A third difficulty facing those in the energy industry is that federal law imposes an overlay of environmental requirements on public lands that work to delay the operations of even the most conscientious, ecologically-sensitive, energy companies. The chief delay-producing statutes are the National Environmental Policy Act (NEPA),<sup>188</sup> the Endangered Species Act,<sup>189</sup> and the Federal Onshore Oil and Gas Leasing Reform Act.<sup>190</sup> A combination of these statutes, their implementing regulations, and the relevant case law has produced the equivalent of a de facto moratorium on new oil and gas leasing and lease renewals.<sup>191</sup> Another

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186. The Federal Oil and Gas Royalty Management Act of 1982, 30 U.S.C. §§ 1701-1757 (1994), authorizes the Secretary of the Interior to audit the accounts of oil and gas lessees on federal lands to assist in the calculation and collection of lease royalties. The Secretary has delegated these powers to the Minerals Management Services. See, e.g., *Phillips Petroleum Co. v. Lujan*, 963 F.2d 1380 (10th Cir. 1992).

187. See, e.g., Amendments to Gas Valuation Regulations for Federal Leases, 62 Fed. Reg. 19536 (1997) (to be codified at 30 C.F.R. pts. 202, 206, and 211); Establishing Oil Value for Royalty Due on Federal Leases, and on Sale of Federal Royalty Oil, 62 Fed. Reg. 3742 (1997) (to be codified at 30 C.F.R. pts. 206 and 208).

188. 42 U.S.C. §§ 4321-4370d (1994).

189. 16 U.S.C. §§ 1531-1544 (1994).

190. Act of Dec. 22, 1987, Pub. L. No. 100-203, §§ 5101-5113, 101 Stat. 1330-256 to 1330-263 (codified at 16 U.S.C. § 3148, 30 U.S.C. §§ 187a-b, 188, 191, 195, 226, 226-3 (1994)).

191. This slowdown in leasing is especially evident on Forest Service lands. See Jan G. Laitos, *Paralysis by Analysis in the Forest Service Oil and Gas Leasing Program*, 26 LAND & WATER L. REV. 105 (1991); see also John F. Shepherd, *Key NEPA Issues Affecting Oil and Gas Development on Federal Lands*, 37 ROCKY MTN. MIN. L. INST. 15-1 (1991). An average of 50% of the subsurface acreage containing known oil and gas reserves on public lands within eight western states is unavailable for leasing due to discretionary restrictions imposed by federal law. See COOPERATING ASSOCIATIONS FORUM, *supra* note 103, at 15.



disincentive facing would-be developers is the ability of federal leasing agencies (for example, the BLM) to recover a wide array of costs associated with federal environmental laws from private developers, such as the costs of preparing an environmental impact statement under NEPA.<sup>192</sup> These types of costs can be substantial and serve to discourage commercial activity on public lands.

## *2. Modern Legal Institutions Have Discouraged Commodity Development on Public Lands While Encouraging Recreation and Preservation*

When the environmental movement achieved full voice in the 1960s and 1970s, groups of reformers mobilized and demanded that federal laws be changed to halt the loss of nature to commercial development. Conservation groups discovered that they had tapped into a latent public concern about environmental degradation and that they had the ear of Congress. Within a decade, federal statutes were enacted that worked to deter private interest in exploiting the economic potential of natural resources on public lands. The newly passed laws, which dramatically increased the amount of land in the National Wildlife Preservation System, the National Wildlife Refuge System, and the National Parks were designed to protect the environment, save the wilderness, enhance outdoor recreational opportunities, and permit legal challenges to private commodity uses of public lands.<sup>193</sup>

Perhaps the most dramatic effect of these recreation and preservation initiatives is that the amount of public lands normally managed according to multiple-use statutes<sup>194</sup> has dwindled, decreasing the land base historically used by resource extractive industries favoring commodity production.<sup>195</sup> For

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192. See Opinion of the Solicitor, Dep't of the Interior, BLM's Authority to Recover Costs of Minerals Document Processing (Dec. 5, 1996).

193. See ALSTON CHASE, IN A DARK WOOD: THE FIGHT OVER FORESTS AND THE RISING TYRANNY OF ECOLOGY 1-2 (1995); see also SAMUEL P. HAYS, BEAUTY, HEALTH, AND PERMANENCE: ENVIRONMENTAL POLITICS IN THE UNITED STATES, 1955-1985 (1987).

194. The Federal Land Policy and Management Act (FLPMA) imposes a multiple use philosophy on BLM lands. 43 U.S.C. §§ 1701(a)(7), 1712(c)(1), 1732(a) (1994). The National Forest Management Act (NFMA), 16 U.S.C. §§ 1600(3), 1601(d), 1602(5)(A), 1604 (e)(1), 1607 (1994), and the Multiple-Use Sustained Yield Act, 16 U.S.C. § 528 (1994), establish multiple use (and sustained yield for the timber commodity) as the foundation for management of Forest Service lands.

195. See generally George Cameron 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); COGGINS & GLUCKSMAN, *supra* note 2, §

example, multiple-use BLM and Forest Service lands cannot support a resource extraction industry if they are (1) classified as national park system units, wilderness, or wildlife refuges; (2) designated as critical habitat for endangered species; (3) developed for recreational use (e.g., for mountain biking or skiing); or (4) subject to access restrictions that prevent commodity development. As a result of Congressional and agency decisions, the multiple-use land base has been halved since 1934.<sup>196</sup>

Federal government actions have done more than shrink the number of acres of multiple-use lands. Some multiple-use statutes were enacted in part because Congress intended to reverse the traditional approach of federal lands agencies that tended to favor consumptive interests. For example, the FLPMA<sup>197</sup> directs the BLM to propose comprehensive plans that give all resources, including nonconsumptive ones like wildlife protection, equal priority in the planning process.<sup>198</sup> FLPMA also assumes that the disposal policies inherent in various federal mining and timber statutes should be replaced by a philosophy favoring the retention of lands and resources in federal ownership to prevent undue commercial development.<sup>199</sup> Pressure to extract and exploit the minerals on public lands has also given way to federal policies that restrict use of mining claims through access regulation.<sup>200</sup>

Another blow to those hoping to return public lands to traditional commodity use has come from the failure of the so-called Wise-Use movement. Its litigation and lobbying strategies have been directed toward ensuring continued exploitation of the resource wealth offered by the public domain.<sup>201</sup> Courts have soundly rejected the movement's arguments that local governments should have more control over public lands, which would have permitted localities to sanction the private exploitation of

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16.02[2][b].

196. See *New FS Policy May Include Bar on Access to Unroaded Areas*, PUB. LANDS NEWS, Jan. 16, 1998, at 1.

197. FLPMA, 43 U.S.C. §§ 1701-1783 (1994).

198. See FLPMA, 43 U.S.C. § 1712(c) (1994); see also Nolen, *supra* note 31, at 833 (pointing out that, despite this statutory mandate, BLM still favors consumptive interests).

199. See 43 U.S.C. § 1701 (a)(1) ("[P]ublic lands [should] be retained in Federal ownership . . .").

200. See, e.g., Schuster & Dierking, *supra* note 181, at 557; see also, e.g., Jakoby v. United States, 38 Fed. Cl. 192 (1997).

201. See generally DAVID HELVARG, *THE WAR AGAINST THE GREENS: THE "WISE-USE" MOVEMENT, THE NEW RIGHT, AND ANTI-ENVIRONMENTAL VIOLENCE* (1994); Hardt, *supra* note 7.

resource commodities on federal property.<sup>202</sup> Wise-Use adherents have also been unable to find much of a sympathetic ear in Congress, causing some commentators to characterize the movement as "little more than a great deal of sound and fury."<sup>203</sup>

### 3. *Local Communities Have Recognized that Nonextractive Alternatives to Traditional Commodity Development Are Economically Preferable*

Several consequences tend to follow the conclusion that resource extractive activities on federal public lands are declining. The more dependent a community is on a resource extractive industry, the more economically depressed it is likely to be. Reliance on a traditional commodity use of public lands risks long term economic decline for local communities if relative prices of extractive commodities fall over time.<sup>204</sup> Conversely, when an extractive industry leaves a local community, although that community may suffer initially, it benefits in the long run because the community has ended its dependence on the exploitation of one natural resource. Indeed, in many Western communities, the loss of a mining or timber harvesting operation on adjacent public lands has resulted in improved employment and real income levels.<sup>205</sup>

While communities that rely on commodity use of public lands tend to have unstable economies, local communities that increase their nonextractive sectors are relatively healthy economically. As extractive industries have declined, a vigorous expansion has occurred in economic sectors that do not require development of raw materials on public lands.<sup>206</sup> Localities

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202. See, e.g., *United States v. Gardner*, 107 F.3d 1314 (9th Cir. 1997); *United States v. Nye County*, 920 F. Supp. 1108 (D. Nev. 1996).

203. Patrick A. Perry, *Law West of the Pecos: The Growth of the Wise-Use Movement and Challenge to Federal Public Land-Use Policy*, 30 *LOJ. L.A. L. REV.* 275, 319 (1996); accord RUDZINS, *supra* note 6, at 146-53.

204. See POWER, *supra* note 6, at 4; see also Tim Woodward, *Boom-Bust Cycle Returns to Town: Silver, Gold Mine to Close in Idaho*, *DENVER POST*, Nov. 27, 1998, at 43A; Jonathan Fuerbringer, *No Refuge in Plunging Commodity Prices*, *N.Y. TIMES*, Aug. 28, 1998, at C1 (noting that a major index of commodity prices worldwide fell to its lowest level in 21 years in 1998).

205. See POWER, *supra* note 6, at 90-92 (discussing the expansion of the economic base of towns that lost employers in the mining industry); Rasker, *supra* note 165, at 382-85 (discussing the economic benefits experienced by towns which lost lumber mills that had used timber on adjacent public lands); see also *Towns Seek Clean Air Along With Good Jobs*, *DENVER POST*, Aug. 17, 1997, at 9A (recounting how the Town of Kremmling, Colorado ultimately benefited economically by the shut down of its Louisiana-Pacific waferboard mill).

206. See POWER, *supra* note 6, at 4-5.

showing the greatest economic strength tend to have a diversified economic base that is linked to environmental and recreational amenities.<sup>207</sup> Cities and counties that are not growing tend to be closely associated with mining, energy, timber, and ranching.<sup>208</sup>

These developments have substantially altered the traditional view that Western states and localities are economically dependent on commodity resources used by the mining, timber, and ranching industries. Indeed, by the 1990s, these extractive industries comprised only a small part of the local and regional economies of communities near federal public lands.<sup>209</sup> The declining importance of commodity goods production is reflected in the current American economy, which does not require indigenous raw materials to thrive. The strongest industries in the modern American economy, such as biotechnology, telecommunications, computers, finance, and transportation, are not based upon products traditionally extracted from public lands.<sup>210</sup> Rather than raw materials, these industries rely upon an educated and skilled work force.

The transformation from a goods to a knowledge-based economy that has taken place in the second half of the century has had a profound effect on the country's social and economic

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207. See RUDZITIS, *supra* note 6, at 106-08 (1996); see also Rasker, *supra* note 165, at 375-78; Sam Howe Verhovek, *Old and New West Clash in Remote Oregon Area*, N.Y. TIMES, Nov. 20, 1998, at A14; Dustin Solberg, *Timber Town Opts for Water Over Logs*, HIGH COUNTRY NEWS, Apr. 27, 1998, at 10-11 (describing how Oregon towns that previously relied on timber mills to fuel the economy now rely on "carloads of vacationers who have built second homes near the [region's] cool waters"); Timothy Egan, *Urban Sprawl is Home on the Range*, N.Y. TIMES, July 9, 1998, at A13 (Montana rangeland being converted to subdivisions because of recreational amenities); Christopher Smith, *Moab's Natives Struggle with an Overabundance of Wildlife*, N.Y. TIMES, Mar. 11, 1998, at Adventure Sports 10 ("Moab's economy and population eroded until two brothers who were out of work as uranium miners . . . began selling . . . 'mountain bikes' . . ."); James Brooke, *Utah is Warming Up to Newest Monument: Tourist Dollars Smooth Ruffled Feathers*, N.Y. TIMES, Oct. 13, 1997, at A8 (noting there is "a growing realization that the region's immediate economic future lies not with coal, oil or gas, but with tourism, modern Utah's largest economic activity"); Mike Evans, *Industry Diversity Could Help State Ride Out Boom-Bust Cycle*, DENVER POST, Nov. 9, 1997, at G1 (stating that less reliance on extraction of energy minerals, and more diversification into the services sector, would alleviate economic problems for Wyoming).

208. See RUDZITIS, *supra* note 6, at 109; see also Mike Evans, *Industry Diversity Could Help State Ride Out Boom-Bust Cycle*, DENVER POST, Nov. 9, 1997, at G1 ("Although Wyoming's coal production is setting records, employment decreased by 2% in that industry because of technological advances.").

209. See, e.g., RUDZITIS, *supra* note 6, at 130; POWER, *supra* note 6, at 43 (noting that only 8% of the work force in non-metropolitan areas is employed in extractive activities).

210. See LESTER THUROW, *HEAD TO HEAD: THE COMING ECONOMIC BATTLE AMONG JAPAN, EUROPE, AND AMERICA* 45 (1993); Rasker, *supra* note 165, at 372-73.

environment. In rural, nonmetropolitan areas abutting public lands, there has been a shift toward a diversified economy, where services play a critical and growing role.<sup>211</sup> Extractive natural resources industries have, by contrast, declined in importance.<sup>212</sup>

The services category excludes all goods-producing industries (for example, agriculture, forestry, mining, fishing, and construction) that produce items for sale in markets. It includes knowledge-based professions, such as engineering, software design, data processing, law, medicine, telecommunications, health and biotechnology, management consulting, government, banking, financial planning, and education, as well as retail trade.<sup>213</sup> Such services provided close to 80% of employment in the United States<sup>214</sup> and over 70% of the Gross Domestic Product.<sup>215</sup> During the past two decades, American companies that exported services abroad (bringing foreign money into the domestic economy) produced a \$59 billion trade surplus.<sup>216</sup>

The changes in the relative economic importance of the extractive and services industries is graphically represented in Figure 1.

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211. See *Towns Seek Clean Air*, *supra* note 205 (noting how the town of Kremmling, Colorado has begun to thrive economically by attracting industry using the town's chief assets—"its mountain location, and the fishing, hiking, and hunting to be had [on the nearby public lands]").

212. See POWER, *supra* note 6, at 57, 62, 78-80.

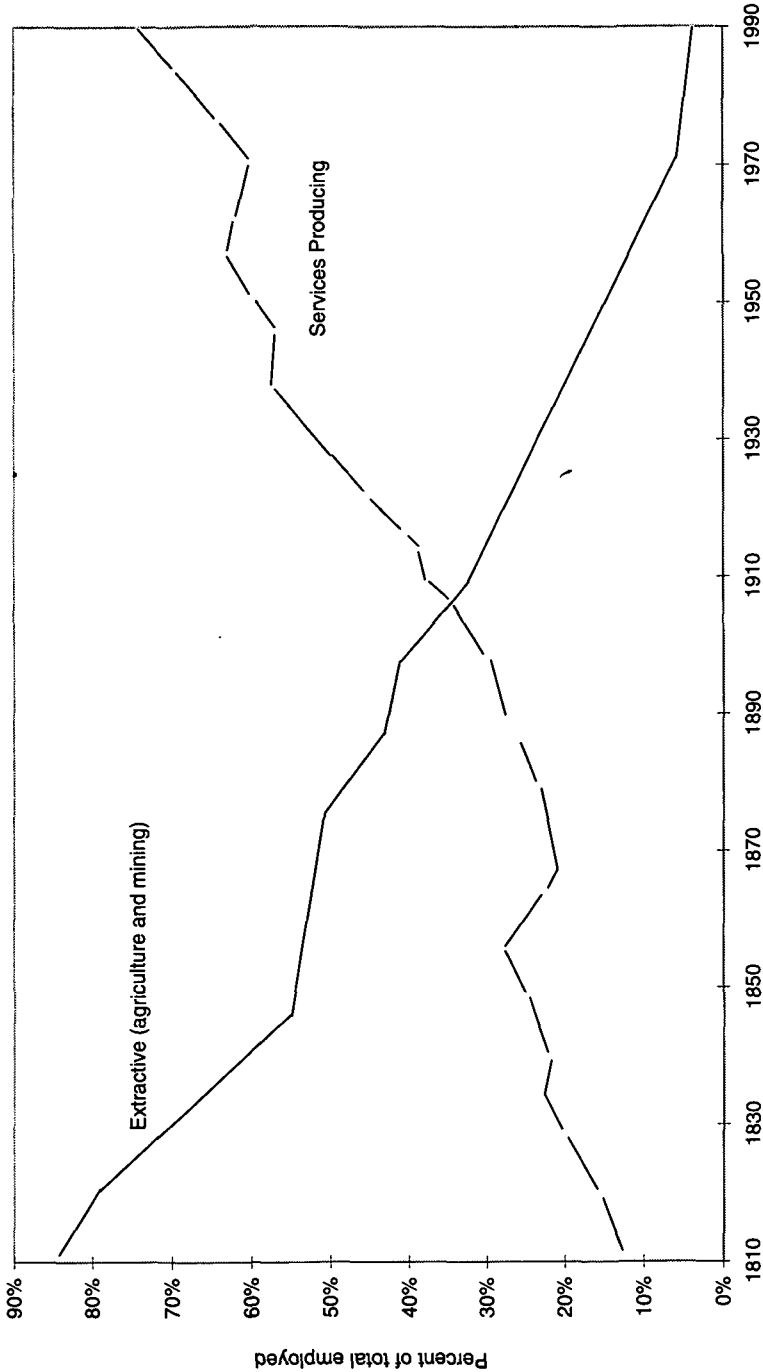
213. See *id.* at 64.

214. For other broad definitions of the term "services," see, for example, STEPHEN S. COHEN & JOHN ZYSMAN, *MANUFACTURING MATTERS: THE MYTH OF THE POST-INDUSTRIAL ECONOMY* 51-54 (1987) (noting that services are what remain after subtracting jobs in farms and factories); Eli Ginzberg & George J. Vojta, *The Service Sector of the U.S. Economy*, *SCI. AM.*, Mar. 1981, at 48, 48 ("In defining services we observe the convention of national accounting that allocates to services all output that does not come from the four goods-producing sectors: agriculture, mining, manufacturing and construction.").

215. See James Brian Quinn & Christopher E. Gagnon, *Will Services Follow Manufacturing Into Decline?*, *HARV. BUS. REV.*, Nov.-Dec. 1986, at 95.

216. See Ralph T. King, Jr., *Quiet Boom: U.S. Service Exports Are Growing Rapidly, But Almost Unnoticed*, *WALL ST. J.*, Apr. 21, 1993, at A1; see also William B. Beyers, *Trends in Service Employment in Pacific Northwest Counties: 1974-1986*, *GROWTH AND CHANGE*, Fall 1991, at 27.

Figure 1 <sup>217</sup>



217. Compiled from BUREAU OF THE CENSUS AND BUREAU OF ECONOMIC ANALYSIS REGIONAL ECONOMIC INFORMATION SYSTEM, HISTORICAL STATISTICS OF THE UNITED STATES (graphically displayed in POWER, *supra* note 6, at 34).

The local economies that are no longer dependent on natural resources, but instead rely upon nonextractive, service-oriented industries, are most visible in the West, where the vast bulk of the country's public lands are located. For example, the eight states in the Rocky Mountain West<sup>218</sup> added over two million new jobs from 1969 to 1991, most of which were in service-related occupations.<sup>219</sup> By 1991, the service-related sectors of the economy constituted over 81% of employment and 68% of labor income in these states.<sup>220</sup>

### *B. Factors Causing Increased Recreational Use of Federal Lands*

One of the major sociological and economic events in the twentieth century United States involves the dramatic increase in recreation, particularly outdoor recreation. By 1997, the Outdoor Recreation Coalition of America reported that more than 90% of Americans over the age of sixteen regularly participate in at least one outdoor recreational activity.<sup>221</sup> Much of the increase has taken place on federal lands.<sup>222</sup> For example, the BLM, whose lands were once thought to be conducive primarily to livestock and mining, recorded 72 million visits for recreation in 1990.<sup>223</sup> The Interior Department's Assistant Secretary for Land and Minerals has acknowledged that the "BLM has changed to meet public needs," in part because "[w]e prize the public lands

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218. Colorado, Idaho, Utah, Nevada, New Mexico, Arizona, Wyoming, and Montana.

219. See generally POWER, *supra* note 6, at chs. 4-7; RUDZITIS, *supra* note 6, at 170-31.

220. See Rasker, *supra* note 165, at 376-78 (citing BUREAU OF ECON. ANALYSIS, DEPT OF COMMERCE, REGIONAL ECONOMIC INFORMATION SYSTEM: FULL AND PART-TIME EMPLOYMENT AND INCOME BY INDUSTRY (1992)); see also Donald Blount, *Economies More Diverse in '90s? Experts Say No*, DENVER POST, Apr. 12, 1998, at J1 (noting that in Colorado, employment in the services sector increased from 20% to 30% of total workforce in the state); Chilson, *supra* note 9, at 13 (noting that Seattle and Denver, once connected to timber and ranching, have more complex economies dependent on high-tech companies, recreation, and services).

221. See Penny Parker, *Sales of Outdoor Gear Hit \$4.7 Billion in '96*, DENVER POST, June 18, 1997, at C1 (reviewing the 1997 *State of the Industry Report* released by The Outdoor Recreation Coalition of America); see also OUTDOOR RECREATION COALITION OF AMERICA, NATIONAL SURVEY ON RECREATION AND THE ENV'T, ch. 4 (1995) ("Overall, outdoor recreation is increasing.").

222. See Christine Bloomquist, *Tourism and Recreation Management: Strategies for Public Lands*, PARKS AND RECREATION, Sept. 1, 1996, at 92; see also NATIONAL SURVEY, *supra* note 221, at ch. 8 ("Federal recreation lands continue to see an increase in visitors.").

223. See BUREAU OF LAND MANAGEMENT, DEPT OF THE INTERIOR, INTRODUCTION TO RECREATION RESOURCES 5 (1995); see also BUREAU OF LAND MANAGEMENT, DEPT OF THE INTERIOR, RECREATION 2000 UPDATE (undated government publication available in 1995).

today for their scenic, recreational, environmental, and archeological significance."<sup>224</sup> The United States Forest Service, the original multiple-use federal agency, experienced a doubling of recreational use in national forests between the late 1960s (150 million visitors annually) and 1990 (almost 300 million visitors).<sup>225</sup> As noted by the Agriculture Department's Under Secretary for Natural Resources: "Timber is not the agenda of the future. Recreation is."<sup>226</sup> Public lands have become so popular for recreation that knowledgeable commentators have opined that "if aesthetic appreciation of nature is deemed a facet of recreation, then recreation is the most frequent, if not dominant, federal land use."<sup>227</sup>

But an overall increase in recreation does not explain why public lands have become recreation destinations. One needs to understand how traditional multiple-use public lands, such as Forest Service and BLM lands, have evolved from extractive uses to dominant, nonextractive, recreational uses. As discussed below, this change in use of public lands has been caused by psychological, sociological, economic, and legal factors.

### 1. *Psychological and Sociological Factors*

As the century comes to a close, one is left with the impression that the physical environments preferred at the beginning of the century have been replaced by a totally different vision of what constitutes an ideal community. One hundred years ago a prosperous setting was one in which extractive industries flour-

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224. Bob Armstrong, *Our Federal Public Lands*, 12 NAT. RESOURCES & ENV'T 3, 7 (1997).

225. See JOHN F. DWYER, DEP'T OF AGRICULTURE, CUSTOMER DIVERSITY AND THE FUTURE DEMAND FOR OUTDOOR RECREATION 8 (1994); see also UNITED STATES GENERAL ACCOUNTING OFFICE, FOREST SERVICE: DIFFICULT CHOICES FACE THE FUTURE OF THE RECREATION PROGRAM B-242 583 (1991); UNITED STATES GENERAL ACCOUNTING OFFICE, CHANGES NEEDED IN THE FOREST SERVICE'S RECREATION PROGRAM 2 (1991) (statement of James Duffus III before Subcommittee on National Parks and Public Lands) (noting that Forest Service lands record more recreational visitor use—a quarter of a billion visitor days per year— than any other federal lands).

226. Timothy Egan, *Adapting to Fees for Enjoying Public Lands*, N.Y. TIMES, Aug. 21, 1997, at A1 ("[R]ecreational users are the biggest users of public land."); see also JAMES P. PERRY & ELLEN R. HORNSTEIN, DEP'T OF AGRICULTURE, RECREATIONAL DEVELOPMENTS ON NATIONAL FOREST SYSTEM LANDS 8-1 to 8-2 (paper delivered at Rocky Mountain Mineral Law Foundation Public Lands Special Institute, Denver, Colo., Nov. 14, 1997) ("Today, recreation is listed as one of the Forest Service's top resource priorities."); James Gerstenzang, *Chief Forges New Path for Forest Service*, DENVER POST, Mar. 2, 1998, at A1; Timothy Egan, *Get Used to New West, Land Managers Tell the Old West*, N.Y. TIMES Feb. 12, 1998, at A10.

227. COGGINS & GLICKSMAN, *supra* note 2, § 17.01.



ished—timber was being turned into pulp and paper; copper was being mined; cattle and sheep were grazing. Today, Americans are more aware that these economic activities impact other sources of well being. What is often far more desirable than a steel mill or paper factory is a pristine natural environment where recreation can flourish, health is protected, air and water are unpolluted, and wildlife is abundant. Americans increasingly judge an area's desirability not by the quantity of commodity goods produced there, but by the environmental and recreational amenities it offers.<sup>228</sup>

Interest in recreation is being fueled by several factors related to how people feel about themselves and their world. Surveys reveal that outdoor recreation has become a significant part of the lives of over 75% of Americans.<sup>229</sup> Reasons for the unprecedented popularity of recreation vary. People are increasingly aware of their health and their bodies.<sup>230</sup> They also have more interest in the natural environment and the growing number of federally managed ecosystems and biologically diverse communities now subject to a preservation mandate.<sup>231</sup>

Public perception of federal lands seems especially dependent on recreational potential. Over 95% of Americans surveyed believe that the federal government should preserve natural areas for the recreational use of future generations.<sup>232</sup> This association between public lands and recreation is in part due to the feeling one has when traveling through these unfenced, unpopulated lands (particularly in the West). The impression that is gained is that "this belongs to me." Such an assumption creates citizen pressure for recreational noncommodity uses, such as backpacking, mountain biking, camping, and fishing.<sup>233</sup>

Various sociological and demographic changes have also served to stimulate the public's desire to use public lands for recreational purposes. Recreation requires leisure time, and

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228. See POWER, *supra* note 6, at 235-42.

229. See, e.g., *Poll: Outdoor Recreation, Activism Are High Priorities*, USA TODAY, Mar. 28, 1991, at 7C (noting that in a poll commissioned by the Recreation Round Table, 77% of a nationwide sample said outdoor recreation was "very important" or "fairly important" to their lives); *Return to Outdoor Activities a Priority for Many in '90s*, USA TODAY, Oct. 31, 1991, at 9C (noting that nearly three-fourths of Americans sampled in a nationwide survey indicated a desire to participate in more active forms of outdoor recreation).

230. See *id.*

231. See *id.*; see also DWYER, *supra* note 225, at 9.

232. See Karen E. Franklin, *Protect Wild Lands*, AMERICAN FORESTS, July 1986, at 49 (noting that of the 2,000 Americans surveyed, 97% agreed that federal lands should be preserved for recreation).

233. See RUDZITIS, *supra* note 6, at 9.

Americans enjoy an average of nearly 40 hours of leisure a week, up from 35 hours in 1965.<sup>234</sup> This country's population is increasing, and much of it is concentrated in urban areas,<sup>235</sup> whose dwellers comprise the fastest growing segment of the population using public lands for recreational purposes.<sup>236</sup> America also enjoys a high level of disposable personal income and an interstate highway system that provides low cost-access to recreation areas far from home.<sup>237</sup> Rising discretionary purchasing power and mobility combine to give recreation-minded urban residents access to public lands and nearby communities.

## 2. *Economic Factors Causing Increased Recreational Use of Public Lands*

For many years, the economic health of states in the West was tied closely to the commodity resources found on public lands—hardrock minerals, coal, oil and gas, water, forage for crops and livestock, and timber.<sup>238</sup> But with the decline of traditional commodity resource use on public lands has come a different economic reality, linked not to extractive industries, but to the emerging recreation value of public lands. Four factors help to explain the dominance of recreation use.

First, one can argue that the recreation resource on public lands is a public good. Public goods generally have two characteristics: (1) they are difficult to exclude persons from; and (2) as a consequence they tend to be over-used. Unlike most commodity resources such as a mining deposit or an oil reservoir, the recreation resource usually has no borders (other than the boundary line separating public and private property). Moreover, no administrative mechanism exists to easily restrict the flow of persons wishing to engage in public-lands recreation. As a re-

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234. See JOHN P. ROBINSON & GEOFFREY GODBEY, *TIME FOR LIFE: THE SURPRISING WAYS AMERICANS USE THEIR TIME* 131-33 (1997); see also ZINSER, *supra* note 117, at 4 (noting that the increase in leisure time was made possible by "shorter work weeks, time-saving devices, flextime, earned time, three-day weekends and four-day work weeks").

235. See *id.* at 8 ("The United States is a nation that is over 86% urban.").

236. See DWYER, *supra* note 225, at 4.

237. See ZINSER, *supra* note 117, at 4-6 (listing "income" and "mobility" as factors that affect the use of recreational resources).

238. See, e.g., James McMahon, *The Most Pressing Environmental Issue Concerns People*, DENVER POST, Apr. 18, 1993, at 2D ("Is it not these very industries—ranching, farming, mining and logging—that provide all of the employment in many of our [western] communities?"); Raymond Rasker, *Rural Development, Conservation, and Public Policy in the Greater Yellowstone Ecosystem*, 6 SOC'Y & NAT. RESOURCES 109 (1993).

sult, once one person is allowed to use BLM or Forest Service lands for recreational purposes, it is quite difficult to exclude others from taking full advantage of similar recreational opportunities. Since it would be incredibly expensive to put impenetrable fences around all public lands not already devoted to recreation, and since it could be administratively burdensome and politically unpopular to collect fees at fixed entrance points to limit those who wish to gain access to these lands, BLM lands and national forests effectively become "commons." Visitors can hike, bike, camp, swim, ride horses, or drive their all-terrain vehicles without asking permission, making a reservation, or paying a fee. As a result, the recreation resource on public lands, as a public good or commons, becomes over used.<sup>239</sup>

Second, recreation has economic worth. The economic value of recreation in part takes the form of dollars that flow into the outdoor recreation equipment market. In 1996, the Outdoor Recreation Coalition of America estimated that retail sales of such equipment (e.g., mountain bikes, hiking and walking shoes, outerwear, skis, kayaks) totaled almost \$5 billion.<sup>240</sup> The outdoor recreation industry provided nearly 800,000 full-time jobs, for a total of \$13 billion in annual wages.<sup>241</sup> Of course, since these are national figures, one cannot presume that the economic benefits of the recreation industry are directed at states in the West where most public lands are located. Still, one can assume that a significant portion of the retail sales for outdoor recreational equipment takes place in, and therefore benefits the economies of, the public lands states.<sup>242</sup>

Third, apart from spending money on (and thereby employing those who manufacture) recreation equipment, outdoor enthusiasts who buy such equipment often use it on the public lands. During their visit to public lands, these individuals typically spend money in surrounding communities. Thus, nearby communities reap an economic benefit from the active participants who come to public lands to fish, hunt, camp, hike, snowboard, and raft, as well as the tourists whose recreation consists only of taking a few steps from an automobile to observe or pho-

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239. For a discussion of public goods theory, see generally Daniel A. Farber, *Free Speech Without Romance: Public Choice and the First Amendment*, 105 HARV. L. REV. 554, 558-60 (1991).

240. See generally Parker, *supra* note 221.

241. See *id.*; see also *Adapting to Fees*, *supra* note 226 ("Human-powered outdoor recreation is a \$40 billion business.").

242. See *Adapting to Fees*, *supra* note 226 ("The Forest Service now claims its land is used for 75% of the gross domestic product of [the recreation] industry . . .").

tograph natural beauty. Both types of recreation create income for communities that are gateways to public lands, thereby boosting their economies.<sup>243</sup> In virtually all population centers near public lands, recreational activities and tourism provide significantly greater employment than commodity resource extraction. Most interior West states now count on recreation and tourism as the first or second largest part of their economies.<sup>244</sup>

The important economic role played by recreation can be seen in two quite different classes of public lands—the national forests, which are subject to a multiple-use mandate,<sup>245</sup> and the national parks, whose conflicting statutory purposes are recreation and preservation.<sup>246</sup> The Chief of the United States Forest Service has estimated that by the year 2000, recreation will account for \$97.8 billion of the total \$130.7 billion generated by uses of the national forests, while fish and wildlife will generate another \$12.9 billion. Most of these recreational dollars are spent in surrounding communities. By contrast, timber harvesting (traditionally the preferred use) is expected to yield only \$3.5 billion.<sup>247</sup> For the National Park Service, recreation has been increasingly favored over preservation.<sup>248</sup> The sheer number of visitors arriving at national parks annually has driven this choice.<sup>249</sup> These visitors desire not only a wilderness experience, but also food, lodging, and travel services; amenities that are supplied by concessionaires, which have a tremendous influence on Park Service decisionmaking.<sup>250</sup>

The “amenity resource value” of recreation is yet another type of economic benefit that flows from public lands. This value

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243. See POWER, *supra* note 6, at 162, 213-16, 233-34.

244. See ATLAS OF THE NEW WEST: PORTRAIT OF A CHANGING REGION 125 (William E. Riebsame ed., 1997); see also POWER, *supra* note 6, at 162 (noting that in eight of ten national forests in Montana, recreation provides three times as much employment as timber harvesting; in Wyoming's nonwestern national forestland, recreation provides nine jobs for every one associated with the timber harvest); Bloomquist, *supra* note 222 (noting that communities near public lands have identified “nonextractive” methods, such as tourism, to capitalize on the decline of agricultural, mining, and forest uses of these lands); Rasker, *supra* note 165, at 375-78 (as the relative contribution of goods-producing industries to the economies of western states has declined, the economic role of tourism and recreation industries has grown).

245. See *supra* text accompanying notes 221-27.

246. See National Park Organic Act of 1916, ch. 408, 39 Stat. 535, 16 U.S.C. § 1 (1994).

247. See Jon Christensen, *The Shotgun Wedding of Tourism and Public Lands*, HIGH COUNTRY NEWS, Dec. 23, 1996, at 13.

248. See Jeffery, *supra* note 7, at 100-01.

249. See Dennis J. Herman, *Loving Them to Death, Legal Controls on the Type and Scale of Development in the National Parks*, 11 STAN. ENVTL. L.J. 3, 14 (1992).

250. See *id.* at 36-42; see also Jeffery, *supra* note 7, at 101-02.

refers to the largely intangible, noncommercial benefits associated with unspoiled natural resources.<sup>251</sup> One important amenity use of natural resources is recreational use.<sup>252</sup> When public lands have recreational value, they become economic assets in much the same way that forage, water, timber, and mineral resources are. They help ensure that the existing people and businesses remain<sup>253</sup> and they help lure potential employers and entrepreneurs.<sup>254</sup> Finally, they provide a quality of life and a sense of place that has value both to people currently living there and to those who might want to move or travel there.<sup>255</sup>

Amenity recreation resource values play an important role not so much in attracting short-term tourists and travelers to an area, but rather in encouraging the relocation of permanent residents and businesses. This, in turn, stimulates and supports diverse economic activity. The presence of such amenity values means that, in many areas near public lands, the use of the lands for recreation far exceeds the economic worth of the land for extraction of commodity resources.<sup>256</sup> Also, communities closely tied to recreation tend to lead both metropolitan and nonmetropolitan areas in economic vitality.<sup>257</sup> Some commentators have even concluded that "the amenity value of recreational opportunities in the intermountain West has been the dominant engine of population and economic growth in that region for decades."<sup>258</sup>

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251. See generally JOHN V. KRUTILLA & ANTHONY C. FISHER, *THE ECONOMICS OF NATURAL ENVIRONMENTS: STUDIES IN THE VALUATION OF COMMODITY AND AMENITY RESOURCES* (1975).

252. See ZINSER, *supra* note 117, at 2 ("The recreational use of natural resources is considered amenity use.")

253. See POWER, *supra* note 6, at 21-2 (amenity resource value helps explain why many western towns show surprising economic vitality after a mine or logging operation closes and environmental quality and recreational opportunities improve); see also Ann Arbor Miller, *Yellowstone Gateway Town in Growth Spurt*, DENVER POST, Mar. 29, 1998, at 36A.

254. See Rasker, *supra* note 238, at 300.

255. This economic value can be measured by the contingent valuation method, which estimates the value of areas such as parks, wilderness areas, uncut forests, ecosystems, and other natural "goods" not normally priced in a private market setting. See Roger Bolton, 'Place Prosperity vs People Prosperity' Revisited: An Old Issue with a New Angle, 29 URBAN STUDIES 185, 203 (1992); see also RUDZITIS, *supra* note 6, at 139-40.

256. See, e.g., ZINSER, *supra* note 117, at 3-4.

257. See generally U.S. DEP'T OF COMMERCE, *ECONOMIC RESEARCH SERVICE* (1994).

258. COGGINS & GLICKSMAN, *supra* note 2, § 17.01.

### 3. *Inducements Found in the Public's Property Interest in Recreation*

As noted previously, the erosion of the extractive use land base has been accompanied by a commensurate rise in the recreation land base. An increase in recreation lands is particularly obvious when one factors in wilderness areas, wilderness study areas, and multiple-use lands denied to commodity developers because of environmental statutes. Not surprisingly, the increase in recreation land base has been accompanied by an increase in recreational use of public lands. Furthermore, there has been a corresponding decrease in the numbers of commodity users.

These increased recreational use patterns on public lands can be explained by reference to a public goods theory that takes into account changes in property rights assignments for users of a resource. This economic theory describes how users of certain kinds of commonly owned resources derive benefits from their consumption.<sup>259</sup> America's public lands are an example of a public good that is characterized by two qualities with respect to its use—"jointness" and "congestibility." A good has jointness in consumption if many consumers may use a given number of units of the good at the same time, without diminishing the utility each derives from the consumption. For example, two mountain bikers may simultaneously use a 20 square mile section of BLM land near Moab, Utah without ever encountering each other or diminishing the pleasure of each other's experience. At this level of use, the public good (the BLM land) has jointness. On the other hand, jointness would be absent if 500 mountain bikers were to use this 20 square mile section at the same time. The use levels would be so high that each biker's enjoyment of the good would be spoiled.<sup>260</sup>

The congestion point occurs when jointness disappears and simultaneous use reduces the benefits each user derives from the public good. A public good is characterized as congestible when so many people consume the same fixed quantity of that good simultaneously that they will interfere with the benefit derived by each user.<sup>261</sup> When the congestion point is reached, the

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259. See generally JAMES M. BUCHANAN, *THE DEMAND AND SUPPLY OF PUBLIC GOODS* (1968). Without the imposition of a property regime, a public good is not subject to private ownership rights.

260. See generally J.C. Head, *Public Goods and Public Policy*, 17 *PUBLIC FINANCE* 197 (1962).

261. See, e.g., Robert P. Inman, *A Generalized Congestion Function for Highway*

only way to maintain the benefits received by each consumer is to increase the supply of the public good being consumed. In the case of the five hundred mountain bikers near Moab, congestion could be avoided, and average benefits from use of the public good retained, if the number of square miles of BLM land available to the bikers is increased.

A resource cost curve can be drawn that indicates the number of units of a public good required to provide a given level of benefits per consumer for a varying number of simultaneous consumers.<sup>262</sup> Figure 2 depicts a resource cost curve for recreational users of public lands. The vertical axis represents the number of units (for example, the number of square miles) of the public good (here public lands) needed to maintain a level of benefit (benefit level 1) per recreational user of the good. The horizontal axis is the number of simultaneous recreational consumers of the public good. The shape of the curve will depend upon the jointness characteristics of the public good resource. When consumption, or use, of a resource that is a public good does not decrease the benefits that others derive from their simultaneous consumption of the same number of units of the resource, there is perfect jointness.<sup>263</sup>

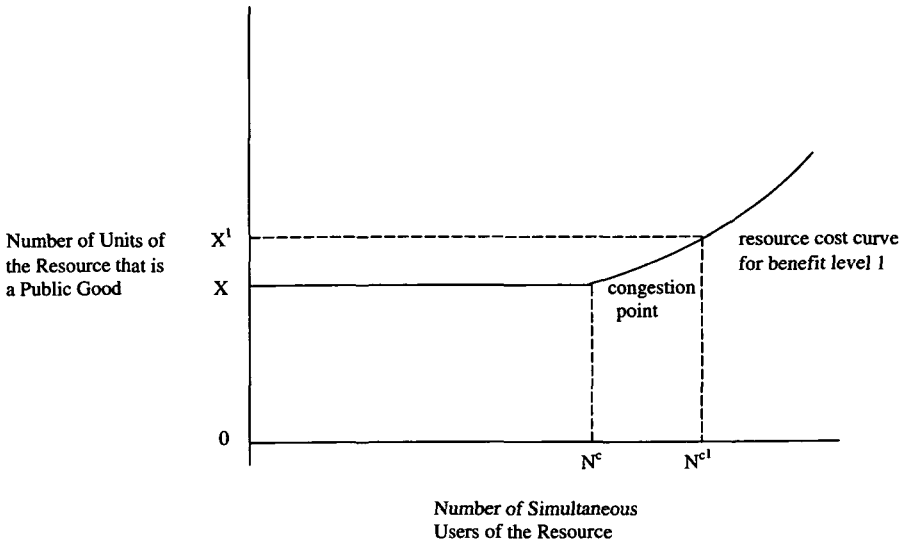
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*Travel*, 5 J. URBAN ECON. 21 (1978).

262. The curve is a "cost" curve in that it reflects the increasing number of units that eventually must be provided in order to maintain a level of benefits per consumer.

263. See David W. Barnes, *Enforcing Property Rights: Extending Property Rights Theory to Congestible and Environmental Goods*, 10 B.C. ENVTL. AFF. L. REV. 583, 591-94 (1983).

Figure 2





In Figure 2, assume that the public good is BLM land near Moab, Utah. For any number of recreational mountain bikers between zero (0) and  $N^c$ , the resource (BLM land) at  $X$  units (a number of square miles) has perfect jointness. The level of benefits each mountain biker derives from simultaneous use of  $X$  units of the BLM land is unaffected by simultaneous use of up to  $N^c$  additional mountain bikers. If  $N^c$  is 2 mountain bikers, and  $X$  is 20 square miles of the BLM land, then simultaneous use of the 20 square miles by both of the mountain bikers will not decrease the benefit that each biker derives.

An increase in the number of mountain bikers beyond  $N^c$ , to  $N^{c1}$  however, requires an increase in the number of square miles of BLM land available for mountain biking ( $X^1$ ) in order to maintain for each mountain biker the same level of benefit derived from their simultaneous use. The point at which the resource cost curve begins to curve upwards ( $N^c, X$ ) is the point at which the resource use combines with the nature of the resource to call for more of the resource so that each user over  $N^c$  may enjoy the same level of benefit. Thus ( $N^c, X$ ) is the congestion point.<sup>264</sup>

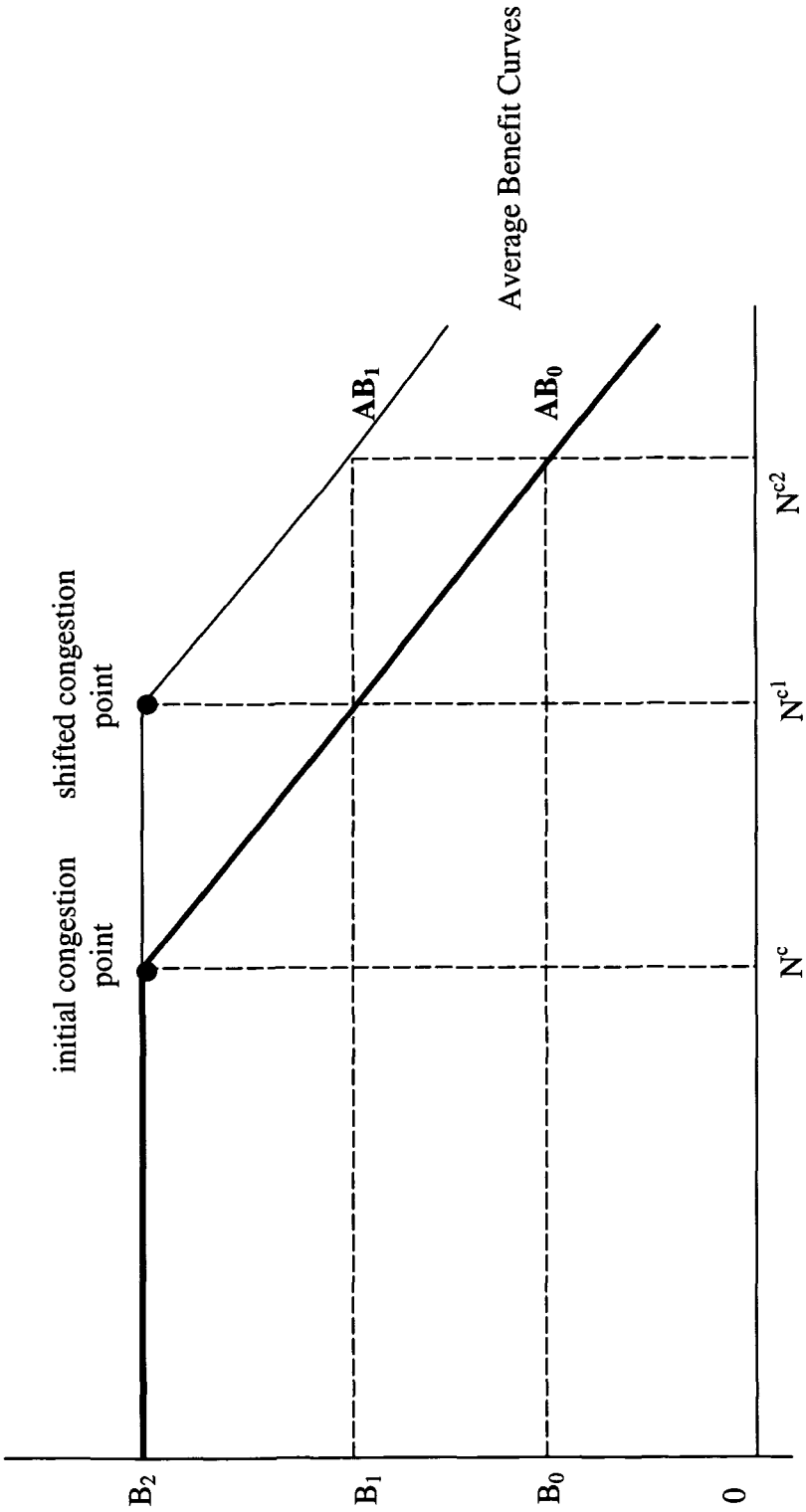
The upward sloping cost curve in Figure 2 assumes the availability of additional units of the resource in order to maintain the benefits derived from simultaneous use of the resource by increasing numbers of users. One can argue that this is what has occurred in the case of federally-owned recreation lands. The erosion of the multiple-use managed land base has been accompanied by a commensurate rise in the recreation land base. These public lands that formerly were subject to commodity development are now available only to recreation users as they require more and more land.

What happens to benefits when additional units of the resource are not available to accommodate users beyond the congestion point? Figure 3 represents how average benefits are affected when there is simultaneous consumption of the same number of units of a resource by growing numbers of users. For the average benefit curve  $AB_0$ , when the number of users is between zero (0) and  $N^c$ , the resource has perfect jointness. A steady level of benefit ( $B^2$ ) derived from using the resource is maintained. When users are greater than  $N^c$ , the congestion point, the average benefit to each user of the resource begins to decrease. For example, when user numbers are at  $N^{c2}$ , the average benefit to each user has dropped from  $B^2$  to  $B^0$ .

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264. See *id.* at 592.

Figure 3



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.<sup>265</sup> 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  $N^c$ . If the resource can still provide the same level of benefit ( $B_0$ ) 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  $N > N_0$ ) 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  $N^c$ , 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.<sup>266</sup> 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.

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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.<sup>267</sup> They have used their considerable lobbying skills to ensure that Congress supports recreational opportunities on public lands, usually at the expense of commodity interests.<sup>268</sup> 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

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

### 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.<sup>278</sup> 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<sup>279</sup> and the 1968 Wild and Scenic Rivers Act.<sup>280</sup> It is a coequal purpose of the national park system<sup>281</sup> and a principal use of national wildlife refuges.<sup>282</sup> Certain resources, notably endangered and threatened wildlife species<sup>283</sup> and wetlands,<sup>284</sup> 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.<sup>285</sup>

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;<sup>286</sup> (2) the emergence of biodiversity and ecosystem management;<sup>287</sup> (3) a growing awareness that preservation lands hold economic value;<sup>288</sup> and (4) the impressive political clout of environmental organizations that espouse preservation values.<sup>289</sup>

### 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.<sup>290</sup> 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.<sup>291</sup> 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.<sup>292</sup>

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.<sup>293</sup> Aldo Leopold saw wilderness as a means of protecting diminishing supplies of big game, fish, and waterfowl.<sup>294</sup> He also correctly predicted that wilderness would both serve as a draw for recreational enthusiasts<sup>295</sup> and permit management of these lands on an ecosystem basis.<sup>296</sup> 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.<sup>297</sup> 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."<sup>298</sup>

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.<sup>299</sup> 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.<sup>300</sup> Designated wilderness areas were created in national forests and BLM lands, and roadless and "de facto" wilderness areas (wilderness study areas) were set aside.<sup>301</sup> 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 inter-related 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-

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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.<sup>302</sup>

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.<sup>303</sup> Original conditions such as old growth forests are to be protected because they are most consistent with 'a healthy ecosystem.'<sup>304</sup> Modern ecology presumes that all species, not just those on the brink of doom, need to be safeguarded.<sup>305</sup> The preservation movement draws upon these ecological themes to support protection of natural processes and linkages.<sup>306</sup>

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.<sup>307</sup> 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.<sup>308</sup>

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 RUDZINS, *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.<sup>309</sup>

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.<sup>310</sup> 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.<sup>311</sup> 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.<sup>312</sup>

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-

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*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 & Darryl 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,<sup>313</sup> 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.<sup>314</sup> Planning guides urging, but not mandating, ecosystem management have been adopted by the BLM,<sup>315</sup> Forest Service,<sup>316</sup> and Fish and Wildlife Service.<sup>317</sup> Even though their enabling statutes do not expressly set out an ecosystem management or biodiversity imperative,<sup>318</sup> multiple-use agencies have nonetheless launched several initiatives consistent with these principles.<sup>319</sup>

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 Boyd, 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,<sup>320</sup> or their worth when preserved in a natural state.<sup>321</sup> 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"<sup>322</sup> and "landscape" values.<sup>323</sup> 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.<sup>324</sup> 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.<sup>325</sup>

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.<sup>326</sup> The results of such studies have led economists to con-

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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, non-consumptive 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.<sup>327</sup>

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.<sup>328</sup>

#### 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.<sup>329</sup> 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.<sup>330</sup>

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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.<sup>331</sup> 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.<sup>332</sup>

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.<sup>333</sup>

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.<sup>334</sup> Since this management philosophy contends that commodity resources like woods and grasslands are healthy only when unfettered biodiversity predominates,<sup>335</sup> human exploitation of these resources on public lands is discouraged as being detrimental to ecosystem health. Conversely, ecosystem man-

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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.<sup>336</sup>

### 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,<sup>337</sup> while recreation and preservation uses are becoming more dominant,<sup>338</sup> even on multiple-use lands.<sup>339</sup> 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.<sup>340</sup> 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.<sup>341</sup> Conversely, public lands that offer recreational amenities, environmental quality, and protected ecosystems directly enhance local economic vitality.<sup>342</sup>

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,<sup>343</sup> 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,<sup>344</sup> which requires them to manage their lands for a variety of potentially competing uses.<sup>345</sup> 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."<sup>346</sup>

Two statutes require the Forest Service to manage its lands

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ments" influence the location of economic activity).

343. See generally E. LOUISE PEPPER, *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")<sup>347</sup> 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.<sup>348</sup> 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.<sup>349</sup> The National Forest Management Act of 1976 ("NFMA")<sup>350</sup> requires the Forest Service to coordinate competing national forest uses in light of resource management plans,<sup>351</sup> which must provide for multiple use of forest resources in accordance with MUSY.<sup>352</sup> NFMA adds "wilderness" to the list of various multiple uses permitted by MUSY.<sup>353</sup>

The Federal Land Policy and Management Act of 1976 ("FLPMA"),<sup>354</sup> mandates that BLM lands be managed for multiple use.<sup>355</sup> 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.<sup>356</sup> 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."<sup>357</sup> 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.<sup>358</sup>

*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.<sup>359</sup> 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.<sup>360</sup> This has resulted in resource over-utilization, waste, below-cost sales, and economic inefficiency.<sup>361</sup>

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.<sup>362</sup> A similar difficulty has emerged with respect to the recreation resource.<sup>363</sup> Forest Service managers accustomed to timber harvesting as the preferred utilization of national forests<sup>364</sup> have had

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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.<sup>365</sup> 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.<sup>366</sup>

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.<sup>367</sup>

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.<sup>368</sup>

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*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,<sup>369</sup> one can argue that it will inevitably evolve into a dominant use strategy.<sup>370</sup> 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.<sup>371</sup> The National Park Service Act,<sup>372</sup> the National Wildlife Refuge System Administration Act,<sup>373</sup> the Wilderness Act,<sup>374</sup> and the Endangered Species Act<sup>375</sup> 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.<sup>376</sup>

## 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.<sup>377</sup> 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.<sup>378</sup>

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

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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.<sup>379</sup> 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."<sup>380</sup> 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.<sup>381</sup> Moreover, even though the Public Land Law Review Commission endorsed the concept of dominant use for BLM lands in the early 1970s,<sup>382</sup> its recommendation was entirely ignored (and implicitly rejected) by Congress when it enacted FLPMA in 1976.<sup>383</sup>

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.<sup>384</sup> 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.<sup>385</sup>

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-

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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.<sup>386</sup> 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.<sup>387</sup> There are several reasons for this phenomenon. Traditional multiple use focuses on individual parcels of land, or aggregates of parcels,<sup>388</sup> 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.<sup>389</sup>

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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).<sup>390</sup>

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.<sup>391</sup> 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.<sup>392</sup>

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.<sup>393</sup> Lands set aside for human-powered recreation also bring out noneconomic physical and psychological gains,<sup>394</sup> while preservation of large segments of the public land base confers ecologi-

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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.<sup>395</sup>

### 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.<sup>396</sup> The BLM has sometimes been called the "Bureau of Livestock and Mining" because of its penchant for favoring these resource industries,<sup>397</sup> while National Forest managers have historically assumed that timber harvesting is the highest and best use of Forest Service lands.<sup>398</sup> 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.<sup>399</sup> 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 & GLUCKSMAN, *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."<sup>400</sup>

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 overridden the good intentions and the discretionary language of the [MUSY, NFMA, and FLPMA],"<sup>401</sup> and "federal agencies frequently capitulate to [local commodity interest groups] . . . ."<sup>402</sup> 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.<sup>403</sup> 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.<sup>404</sup> 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,<sup>405</sup> that below-cost timber sales annually cost the Forest Service between \$35 million and \$112 million,<sup>406</sup> 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.<sup>407</sup> 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.<sup>408</sup>

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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.<sup>409</sup> 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.<sup>410</sup> 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.<sup>411</sup> 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.<sup>412</sup>

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.<sup>413</sup> 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.

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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 RUDZINS, *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.<sup>414</sup>

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.<sup>415</sup>

##### *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-

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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.<sup>416</sup> 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.<sup>417</sup> 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,<sup>418</sup> as well as a ban on fixed anchors for climbers in certain wilderness areas.<sup>419</sup> When federal agencies fail to rein in use of motorized recreational vehicles, they may be subject to litigation initiated by preservationist organizations.<sup>420</sup>

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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.<sup>421</sup> 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.<sup>422</sup> 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

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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.<sup>423</sup> 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.<sup>424</sup>

As a result of scientific and academic support for ecosystem management,<sup>425</sup> 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.<sup>426</sup> 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.<sup>427</sup> 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.<sup>428</sup> 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.<sup>429</sup>

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

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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.<sup>431</sup> 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,<sup>432</sup> they do not form a coherent comprehensive framework for managing biodiversity on public lands.<sup>433</sup>

*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.<sup>434</sup>

- *Definitional Ambiguity:* "Ecosystem management" suffers from the absence of a generally accepted definition.<sup>435</sup> As a result, the nature of ecosystems, as well as their management, often become whatever policy-makers want them to be.<sup>436</sup> It is common for federal agencies to use many different definitions of ecosystem management.<sup>437</sup>
- *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.<sup>438</sup> 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.<sup>439</sup> 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.<sup>440</sup>

- *Delineating Ecosystem Boundaries:* Biodiversity and ecosystem planning require large, preferably undisturbed, tracts of land.<sup>441</sup> In determining the appropriate geographic scale, decisions must be made regarding the relevant boundary for the ecosystem. Is a watershed the best ecosystem unit,<sup>442</sup> or a biome?<sup>443</sup> 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.<sup>444</sup>
- *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.<sup>445</sup> Moreo-

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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. DEPT 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.<sup>446</sup> Collaboration and consensus-building with state and local governments, as well as with private landholders, is likely to be equally demanding.<sup>447</sup>

The problems associated with ecosystem management have prevented this management philosophy from succeeding in many individual cases.<sup>448</sup> 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.<sup>449</sup> Additionally, Congress has not been receptive to ecosystem management.<sup>450</sup>

### 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 Haeuber, *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.<sup>451</sup> It must be understood, however, that recreation, even nonmotorized recreation, is often inconsistent with preservationist values.<sup>452</sup> Recreation and preservation also foreclose commodity development of public lands, even though there are advantages to securing essential commodity resources from federal lands.<sup>453</sup> A new management philosophy must therefore reckon with the inevitability of some human interaction with public lands.<sup>454</sup> This human intervention will surely entail both noncommodity recreational use, some level of commodity development, and some incursions by recreationists 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,

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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.<sup>455</sup> Timber clearcutting detracts from the aesthetic benefits to the recreational hiker and reduces the habitat of certain wild-life 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,<sup>456</sup> 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.<sup>457</sup>

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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.<sup>458</sup> 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.<sup>459</sup> 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.<sup>460</sup> The marginal cost (MC) of expanding the land base for recreation and preser-

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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).

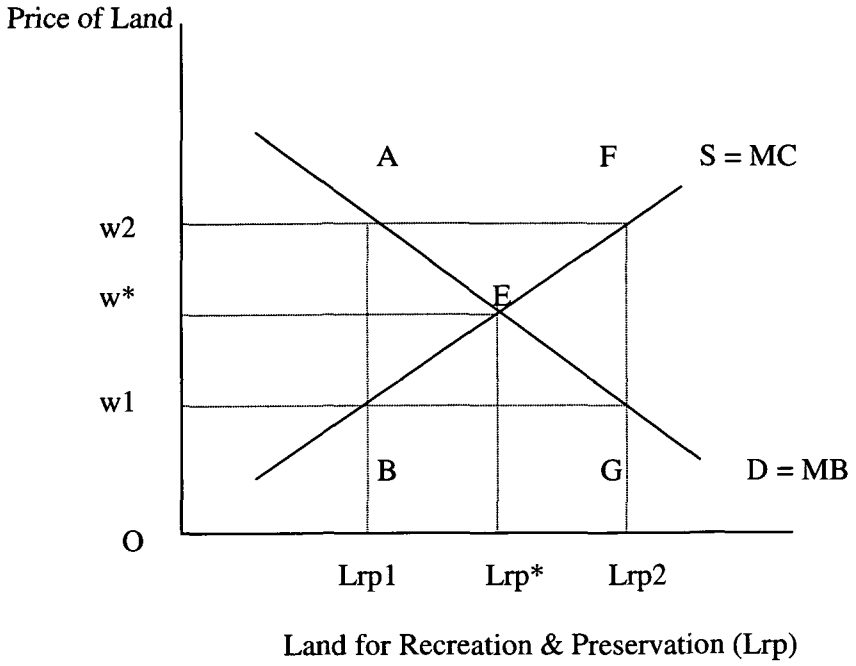
459. Framing the land management problem in terms of land allocation simplifies the problem to one variable, land. This approach is consistent with the Forest Service's current forest planning system, which has been analogized to a zoning ordinance that restrict uses in designated regions. See Michael 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 ( $L_{rp}^*$ ) 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.<sup>461</sup> 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.<sup>462</sup> 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.<sup>463</sup>

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,<sup>464</sup> 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.<sup>465</sup>

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.<sup>466</sup> Two generally recognized passive use values are "option value" and "existence value." Option value measures the amount an indi-

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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.<sup>467</sup> 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.<sup>468</sup>

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.<sup>469</sup> 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.<sup>470</sup> 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-

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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)<sup>471</sup> and the Oil Pollution Act of 1990 (OPA)<sup>472</sup> 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<sup>473</sup> and entitle a plaintiff using such methods to a rebuttable presumption of accuracy.<sup>474</sup>

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.<sup>475</sup> In the 1989 landmark case of *Ohio v. U.S. Dep't of Interior*,<sup>476</sup> 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.<sup>477</sup> 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.<sup>478</sup> 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.<sup>479</sup> In a separate 1998 ruling on DOI

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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.<sup>480</sup>

Government agencies also have relied on the travel cost method and contingent valuation to estimate the value of recreation and nonmarket environmental resources.<sup>481</sup> The U.S. Water Resources Council has identified the travel cost method and contingent valuation as the two preferred methods for valuing outdoor recreation.<sup>482</sup> 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.<sup>483</sup> Other state fish and wildlife agencies have also used these methods to value fish and wildlife-related recreation for the purpose of formulating policy.<sup>484</sup>

### 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.

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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.<sup>485</sup> To estimate recreation benefits, the Forest Service has relied on studies utilizing the travel cost method and contingent valuation.<sup>486</sup> 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.<sup>487</sup> 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.

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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<sup>488</sup>**  
**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
<b>Total</b>		345.1	<b>8,288</b>	73.4	<b>1,520</b>

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),<sup>489</sup> Wild and Scenic Rivers (4,316 miles on NFS lands and 2,032 miles on BLM lands),<sup>490</sup> fishable streams and rivers (128,000 miles on NFS lands and 174,000 miles on BLM lands),<sup>491</sup> waterfowl habitat (12 million acres on NFS lands and 23 million acres on BLM lands),<sup>492</sup> wildlife, fish and plant species (NFS 13,000 species on NFS lands and 8 thousand species on BLM lands),<sup>493</sup> and threatened or endangered species (283 species on NFS lands and 300 species on BLM lands).<sup>494</sup>

Numerous economic studies attempt to value the benefits of preserving specific natural areas that face proposed development projects.<sup>495</sup> Other studies have estimated the value of specific resources such as wilderness areas,<sup>496</sup> wetlands,<sup>497</sup> 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](http://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](http://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.<sup>498</sup> A recent study by Robert Costanza, Ralph d'Arge, and others takes a new approach.<sup>499</sup> 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.

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*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<sup>500</sup>**  
**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
<b>Total</b>		191.0	<b>71,739</b>	264.3	<b>222,341</b>

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.<sup>501</sup> 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

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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. DEPT 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.<sup>502</sup>

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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<sup>503</sup>  
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%)	<b>8,288.0</b> <b>(10%)</b>	0.9 (1%)	<b>1,520.0</b> <b>(1%)</b>
Preservation: Eco- system Services	0.0 0%	<b>71,739.0</b> <b>88%</b>	0.0 0%	<b>222,341.0</b> <b>95%</b>
Other	7.3 (1%)		26.8 (26%)	
Total	592.6	<b>91,313.4</b>	103.6	<b>233,997.3</b>

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.<sup>504</sup> 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.<sup>505</sup> 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.<sup>506</sup> These types of innovations shift upwards the demand for recreation and preservation of

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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.<sup>507</sup> 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.<sup>508</sup> 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.<sup>509</sup> Alternatively, a user fee system provides certain advantages for implementing an efficient policy.<sup>510</sup> 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.

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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.