

Environmentalism, the Administrative State, Federal Lands and the Erosion of Property Rights to Land

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Abstract

The federal government owns and administers 472, 892,659 acres or 21% of the land area of the lower US, making it both the country's largest land owner and the largest among western democracies. This is surprising, given that the US generally is viewed as more oriented toward private property rights and markets. The land is managed by the US Forest Service and the Bureau of Land Management, staffed by unelected, career civil servants who hold tenure to their positions. Access and regulation are determined by bureaucratic officials who have wide latitude under all-purpose legislation passed by Congress. General citizens have little information about how such decisions are determined and only costly recourse to challenge them. Other than the comparatively small, 27,400,000 acres in National Parks, most of the land has no important amenity values nor apparent major externalities associated with use. These lands were to be transferred to private claimants under 19th century land laws. This paper examines how this vast area came to be withheld by the federal government and the role of the environmental movement in the process. Market failure and externalities were asserted justifications, but these assertions do not stand empirical examination. The sustained-yield template established with reserved federal lands provides a basis for contemporary administrative regulation of private property rights and markets. Although externalities are possible with some resources, air, groundwater for instance, they are less likely for land where property rights can be more completely defined as mitigation. This option was and remains rejected by agency officials and environmentalists who seek permanent management and control for philosophical, not economic reasons. There are important implications for markets, citizens, and the role of the state in society.

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Introduction.

American economic, political, and social development has been molded by widespread ownership of land. From the colonial period through around 1900, land was the major resource in a largely rural, agricultural economy. The Jeffersonian ideal, enshrined in federal land laws, was to transfer the federal government's land estate as quickly possible to private claimants. This was viewed as in the public interest. Easy access to land facilitated economic advance, a position in politics, and a stake in the society. It shaped individual expectations, practices, and wellbeing. Land ownership and trade reallocated land and generated capital gains that helped to fund the growth of financial and other asset markets. The rapid transfer of federal government lands to private claimants was made possible by a stable political coalition representing potential actual settlers, developers, railroads, and an almost universal participation among US citizens in land acquisition and sale.

This coalition ended in the late 19th century, and federal land policy shifted from virtually free access to retention and permanent management by the administrative state. Urbanization and industrialization meant that fewer citizens were directly tied to land ownership. At the same time, as the agricultural frontier moved beyond the 98th meridian and encountered a semi-arid climate and rugged terrain, the small-farm distribution that had worked well in the wetter, flatter East and Midwest no longer was effective. The land laws could have been modified to provide larger allocations of timber, range, and farm lands to fit the region. But they were not. Private property rights and exploitation were discredited by early environmentalists as being driven by short-run profits, leading to rapid depletion and waste. Retention of remaining federal lands and their permanent supervision under sustained-yield, scientific management was the remedy. The land laws gradually were repealed with the government retaining 472, 892,659 acres or 21% of the land area of the continental US. Where before private property rights to land were viewed as essential for the public interest, government ownership and management were asserted, instead, to be required for the public good.

The same advocates for retention of federal lands became leaders of the bureaucratic agencies that managed them. They were joined in their efforts by professionals with discipline-based training in engineering and forest and range management, and plant biology who staffed the growing merit-based federal bureaucracy. Private property rights and unconstrained decision-making did not fit within their regulatory plans that called instead for rational, sustained-yield utilization. Further justification for government ownership and supervision came from welfare economics where market failure was highlighted as generating externalities that were correctable by government intervention. Progressive Era politicians who sought a wider range for their leadership and corresponding government involvement in the economy echoed the claims of environmentalists and supported retention of federal lands. Absent a strong political counter, there was no effective resistance to the administrative state. Further, the general citizenry had little access to the information needed to question whether or not government ownership of so vast an area was in the public interest. The justifications for

regulation made by early conservationists and the management plans they implemented over time on federal lands became templates for the subsequent, more extensive environmental regulation after 1960. The federal lands today are advertised as “the Public Lands” to emphasize the public goods said to be provided by government ownership and oversight.

Although there can be externalities and market failure associated with private decision-making when property rights are incomplete, the direct remedy would be to make the property rights more complete, and not necessarily a resort to government ownership, regulation, or taxes. Externalities are more likely to occur with difficult to bound-and-observe resources, such as the atmosphere or groundwater, rather than surface land. Yet, withholding and managing federal land was the focus of early environmentalists. Despite all of this, there is no compelling empirical evidence to support their arguments. Their assertions of inherent short-term biases and stock depletion by private parties were based on philosophical views of the benefits of sustained-yield management. Potential claimants of federal land were coopted with promises of long-term access and subsidized use. Later, as political coalitions shifted and regulatory agency interests changed, these promises were broken as new parties—recreationalists, environmentalists and preservationists--were granted access under the notion of multiple use. Multiple use grants discretion to the bureaucracy in allocation and regulatory decisions in a manner that promotes the agency and its favored lobby groups, but does not necessarily advance broad public welfare.

The paper proceeds as follows. Section II summarizes the economic, social and political arguments for private ownership of land as well as the counter arguments for government ownership, regulation, or taxes. Section III describes the transfer of government land to individuals and the land laws that facilitated it from colonial times through the late 19th century. Section IV presents the rise of the conservation movement that halted the land transfer process and critically examines the evidence behind it. Section V examines the role of the administrative state in regulation.

II. The Economic, Social and Political Institutions of Property Rights.

As an economic institution, property rights to land critically shape behavior by fixing incentives for resource use, investment including conservation, exchange, and inheritance (Libecap, 2018). They set time frames, determine the decision makers who bear associated benefits and costs, and determine the degree to which private costs and benefits align with social ones. Economists and economic historians have long recognized the critical role of property rights in determining economic performance (Davis and North, 1971; North, 1981,1990; Alston, Libecap, and Schneider, 1996; Acemoglu, Johnson and Robinson, 2001, 2005; Dixit, 2009; North, Wallis, and Weingast, 2009; Acemoglu and Robinson, 2012). Moreover, complete property rights eliminate rent dissipation otherwise associated with common-pool resources (Gordon, 1954; Scott, 1955; Cheung, 1970; Johnson and Libecap, 1982; Wiggins and Libecap, 1985).

The primary long-term economic benefits of property as an institution, arise from private property rights (Merrill and Smith, 2010). Although group management of resource access and use has been effective in overcoming the losses of small-scale common pool resources (Ostrom, 1990), the conditions for such successful collective action are limited. Criticism of private property rights and resource use arises from market failure and externalities. Pigou (1922), Baumol (1972), and Meade (1973) among others describe situations where private costs and benefits do not coincide with social benefits and costs, generating negative externalities and over exploitation. The cure described in welfare economics is either government taxes to raise private costs to equal social ones or regulation to constrain use to socially-optimal levels. Coase (1960, 15-16) questioned these arguments by asserting that the resulting costs of tax and regulation could be greater than the social costs of the problem, thereby lowering, not raising social welfare. Moreover, Coase and Cheung (1970) suggested that the solution to externalities, overlooked in the welfare economics literature and indeed in much of the subsequent environmental economics literature, was to make property rights more complete and for parties to trade to achieve environmental improvement. A key problem not emphasized in any of these literatures with government ownership or regulation is that neither politicians nor bureaucrats are full residual claimants to the benefits and costs of their actions in the way that private owners can be with complete property rights. Accordingly, political and bureaucratic incentives and decisions will not necessarily align with the public interest, potentially creating costly externalities (Libecap, 2016).

Social and Political Institutions of Property Rights.

Political economists, philosophers, and legal scholars have emphasized different aspects of property rights, not generally addressed by economists. They are critical, however, for understanding the importance of private property in US economic development and why reversal of US land policy to achieve alleged environmental goals through government ownership represented such a profound change.

Claire Priest (forthcoming, 2019) summarizes much of the early literature and key elements of US colonial and early federal land law. William Blackstone commented in 1766 on the implications of private ownership of land: “There is nothing which so generally strikes the imagination, and engages the affections of mankind, as the right of property; or that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe” (quoted in Ellickson, 1993, 1317). English colonization and migration to North America were driven by these ideals (Ely 2008, 13). Those who migrated to and occupied land eventually held it in fee simple as independent owners and not as a dependent peasantry that generally characterized Latin American settlement (Supreme Court Justice, Story, 1858, 160).

Because land was the most basic resource, its widespread ownership became the catalyst for colonial and subsequent US economic and political development. The ownership of property made individuals special stakeholders in the society and dispersed

political and economic power from elites. Dynamic, open land markets became an essential ingredient for the credit system and its ability to support growth of a middle class as well as to spur investment and innovation throughout the economy (Priest, forthcoming 2019, Chapter 1, 7). The irony, as described later, is that active involvement in land markets, speculation, and capital gains so appreciated in early discussions of colonial and US land policies, become negatives for advocates of government intervention by the end of the 19th century. These wealth-creating, reallocation activities instead were asserted as evidence of a lack of sustainable, long-term scientific management deemed essential by conservationists in lobbying for retention of state ownership.

Perhaps the most famous advocate of extensive private ownership of land in small plots was Thomas Jefferson, who saw a nation of numerous, small freeholders not only as good economics, but good politics. The seemingly endless abundance of land in North America provided the perfect opportunity to create a society composed of small, independent, freeholding farmers that could support a republican form of government. Such citizens with an attachment to the land and to the country had virtue and a common interest in political stability and social cooperation. He notably stated that: “The earth is given as a common stock for man to labor and live on... The small landholders are the most precious part of a state” (quoted in Katz, 1976).

The extensive availability of fertile land to small holders, who could secure and cultivate freeholds not only invited vast immigration, but generated an egalitarian society with high levels of real per capita income. By 1751 the British North American colonies may have had 1 million inhabitants, compared to 52,000 or so in New France and a generally small number of immigrants to the Spanish and Portuguese colonies of South America (Linklater, 2013, 79). Lindert and Williamson (2013, 2014a, 2014b) report that in 1774 the American colonies had the most equal distribution of income in the western world and per capita purchasing of income exceeded that in Great Britain.

Even later in the 19th century, the US Public Lands Commission endorsed the small-farm, homestead principle: “The maxim that He who tills the soil should own the soil is accepted as a fundamental principle of political economy... Small holdings distributed severally among the tillers of the soil is believed to be a fundamental condition for the prosperity and happiness of an agricultural population” (US Public Lands Commission, 1880, xxii). Frederick Jackson Turner in 1893 in his well-known thesis about the role of the frontier in US political and social development went further, claiming that America ultimately was shaped by small-farm frontier settlement as the underpinning for democracy, an independent citizenry, and generalized economic wellbeing (Turner, 1893, 203).

III. Land Laws for Transferring Property Rights to Land.

Table 1 lists the major federal land laws enacted by Congress after the colonial period that distributed property rights to land and minerals on the frontier. The demand

for free small freeholds was incorporated into policy, beginning with the Preemption Act of 1830 and its many amendments (Kanazawa, 1996) to accommodate and legally recognize squatter claims and on through the Homestead Act of 1862 and its adjustments. The Homestead Act effectively was ended by Congress in 1934 with enactment of the Taylor Grazing Act that removed relatively flat rangeland from entry and claiming and formally in 1976 with the Federal Land Policy and Management Act (see Table 2). Both laws underscored the prevailing shift toward government ownership and management of land and other resources rather than distribution to citizens as had been the principal aim.

Under all laws, property rights to agricultural land were given out piecemeal in plots of 40 to 160 acres (later, up to 640 acres) with the requirement of occupancy and beneficial use (Hibbard, 1924; Robbins, 1942; Gates, 1968, 394). Through these land allocation laws, immense amounts were placed under private ownership. Under the Homestead Act, for example, some 2,758,818 original entries were made between 1863 and 1920 for 437,932,183 acres, an area larger than Alaska (Gates 1968, 799-800).

The General Land Office was created in 1812 to administer and extend the survey across the continent and to distribute additional federal lands under land laws enacted by Congress (Table 1 below). The General Land Office began as the administrative agency for implementation of the land laws. Later, in the 1920s as this activity became less lucrative in terms of budget growth and staffing, the agency and the Department of the Interior overall shifted positions to support retention of federal land. When it did so, the agency competed directly with the US Forest Service and the Department of Agriculture that already were lobbying for holding on to and managing the remaining federal lands in the name of scientific management (Libecap, 1981a).

All in all, the settlement of the agricultural frontier through the rapid assignment of private property rights to land was a positive for social welfare and the economic development of the US. A vast migration was absorbed from eastern states and Europe; stable, prosperous communities were established; and agricultural production grew. There is no discussion, even in revisionist histories, of major environmental externalities until late in the 19th century with the advent of the conservation movement.

Table 1: Federal Land Distribution Laws.

Law	Date	Stated Goal and Brief Impacts
Land Ordinance of 1785	May 20, 1785	Established the Public Land Survey System.
Land Ordinance of 1787 (Northwest Ordinance)	July 13, 1787	Determined that the land south of Canada, north of Ohio, west of Pennsylvania and east of the Mississippi river would be distributed by Congress, and that Congress would institute governments and laws in this territory.
Land Act 1796	May 18, 1796	Made the rectangular system of 6 square mile townships permanent, and determined the size of sections to be sold. Set minimum land prices.

Preemption Act	May 29, 1830	Allowed settlers to occupy and purchase federal lands for up to 160 acres at \$1.25 an acre.
Preemption Act	September 4, 1841	Permanently recognized preemption or squatter claims of land. Donaldson (1884, 1247) estimates around 175,000,000 acres were secured by individuals under the Preemption Acts.
Graduation Act	August 3, 1854	Reduced the minimum prices of unsold federal government from \$1.00/acre to \$0.125/acre.
Homestead Act	May 20, 1862	160 acres of federal land was made available to individual actual settlers that after 5 year's continuous residency.
Coal Lands Act	July 1, 1864	Distributed coal lands at \$20/acre and allowed individuals and associations to claim 160 acres and 320 acres respectively.
Timber Culture Act	March 3, 1873	Authorized an additional 160 acres to Homestead claims if 40 acres of trees were grown in semi-arid regions.
Desert Lands Act	March 3, 1877	640-homesteads at \$1.25/acre if irrigation systems were put in place within 3 years.
Timber and Stone Act	June 3, 1878	Authorized sale of land at \$2.50/acre for land valuable for timber or stone in far western states and territories.
Mining Lode Act	July 26, 1866	First major mining law, allowed individuals to claim ownership of ore veins.
Mining Act	May 10, 1872	Second major mining law, added placer or shallow ore bodies; required a \$100 investment in development to obtain title; procedure for obtaining title outlined.
Oil Placer Act	1897	Recognized oil deposits as claimable as a placer ore deposit under the Mining Act of 1872.
Stock Raising Homestead Act	December 29, 1916	Authorized 640-acre homesteads to raise livestock.

Source: Libecap (2018).

IV. Property Rights to Western Government Land.

Federal land laws provided for low-cost transfer from government to private ownership effectively east of the 98th meridian that commonly is the break between wetter, flatter parts of the US and much drier, more rugged terrain to the west. In the latter, small-plot agriculture was not as viable with much land better suited for grazing livestock and timber operations. The land laws, however, were never significantly modified to facilitate private claiming for larger homesteads, timber, or rangeland. There was no strong political constituency in support of such actions. Moreover, because large areas of federal land could not be claimed for title, they were exploited as a common property resource with attendant negative outcomes. These were highlighted by

environmentalists in the late 19th century as evidence of market failure and the need for continued government ownership and supervision.

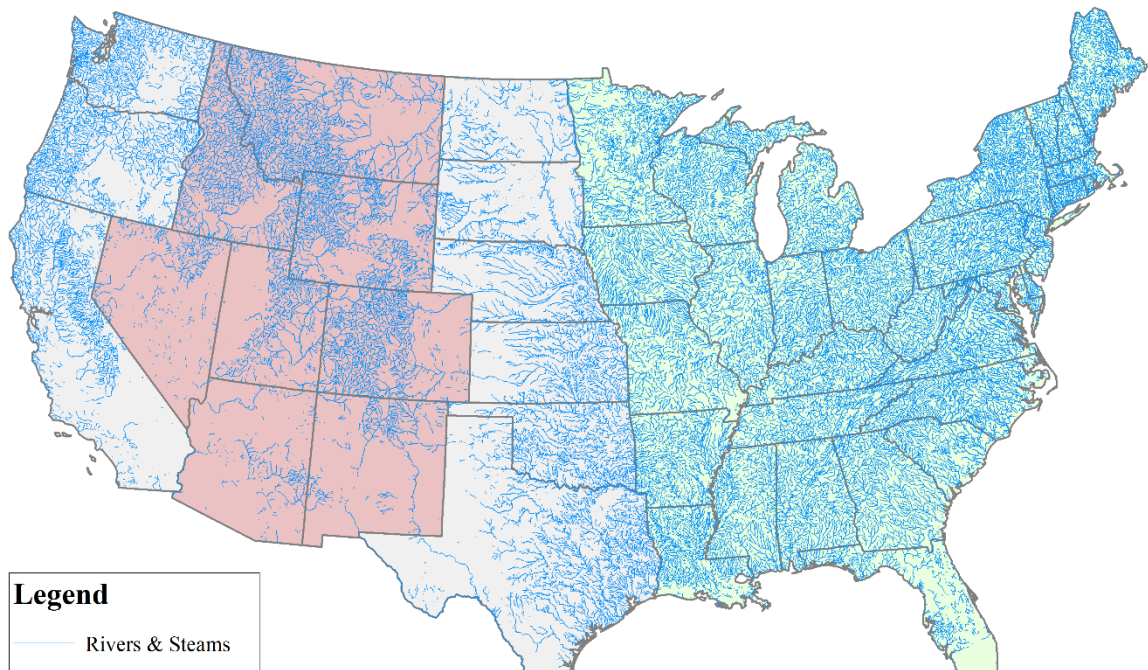
Environmental advocates were successful ultimately both in withholding federal land from private claimants as well as enshrining the notion of externality that could only be corrected by administrative regulation. The obvious alternative of lowering the costs of defining private property rights to land was not considered. It did not fit the new Progressive Era paradigm and advocates were able to coopt potential claimants—homesteaders, livestock owners, and timber companies with privileged access and use. Unfortunately, for these groups, as their political influence waned by the mid-20th century, these privileges were gradually weakened as new political constituents, recreationalists, preservationists, and more aggressive environmentalists became ascendant.

Figure 1: The Semi-Arid, Rough Region west of the 98th Meridian



Source: Powell, 1879, frontispiece, reprinted in Worster (2001, 349).

Figure 2: Differential Stream Density beyond the 98th Meridian.



Potential Claimants: Homesteaders.

By 1870 as homesteaders moved into the region beyond the 98th meridian, neither the climate nor the terrain allowed for feasible small farms in 160 parcels. Claims made during wet periods failed during dry ones and farms were abandoned. If the homestead had been fulfilled as required by the land laws and the party had title, then the failing farm could be sold. Larger, consolidated farms took their place. If the homestead had not been completed and the farmer lacked title, then the land reverted back to federal ownership (Libecap and Hansen, 2002). In his *Report on the Arid Lands of North America* made to Congress in 1878, John Wesley Powell called for minimum 2,560 acre homesteads, 16 times greater than the size of standard homestead allotments to address the problem, but nothing came of it. There were only small adjustments in allotments to 320 and 640-acre sizes authorized for some areas.

As Libecap and Hansen (2002) and Hansen and Libecap (2004) show, in the late 19th century there was no conclusive evidence that small farms were not appropriate for the region, especially if settlement actually increased rainfall, “rain follows the plow,” if new dry farming techniques could offset aridity, or if sufficient irrigation networks could be developed. In light of this, there was no concerted action by the homestead lobby for relaxation of the small homestead requirement. The homestead lobby was made up of potential claimants, existing land owners who sought to speculate in new lands, land and town developers who also wanted access to federal land for subsequent sale, brokers who

specialized in linking potential buyers with newly available homestead land, and the railroads that desired dense settlement to raise demand for transportation and to populate the town sites that they owned. It also included local politicians who sought greater population to justify movement from territory to statehood and thereby open new political opportunities, as well as the General Land Office in the Department of the Interior whose mandate was to process homestead claims (Hansen and Libecap, 2004). Adjustments in the land laws would only have reduced the amount of land available for new homesteads. Overall, there was a strong sentiment for maintaining the Homestead Act in its traditional form as illustrated by Representative George W. Julian of Indiana:

“If our institutions are to be preserved, we must insist upon the policy of small farms, thrifty villages, compact settlements, free schools, and equity of political rights, instead of large estates, slovenly agriculture, wide-scattered settlements, popular ignorance, and a pampered aristocracy lording it over the people.”
(quoted in Hansen and Libecap, 2004, 107).

Later, by the turn of the 20th century and major droughts in the northern Great Plains, the evidence became clearer that neither the climate would change nor would dry farming techniques save small farms (Libecap and Hansen, 2002; Hansen and Libecap, 2004). Irrigation, however, could. Provision of federally-subsidized irrigation became the favored alternative, not revision of the land laws for both homesteaders and environmentalists desiring to withdraw other federal lands from private claiming.

Potential Claimants: Ranchers.

Livestock owners also moved into the region beyond the 98th meridian, often ahead of homesteaders. The open range was ideal for livestock, and internal and export demands were growing (Libecap, 1992). There was, however, no provision in the land laws for ranch or livestock-raising claims (Libecap, 2007). All homestead allotments were far too small for a viable ranching operation in a semi-arid region where 25 acres or more were required annually to support one cow. One homestead would support 6 cows, when herds were in the thousands, often requiring ranches of 10,000 acres or more for an economically-viable operation. Although the 1880 Public Lands Commission recommended revision of the land laws to allow for larger grazing homesteads of 2,560 acres and cash sales of rangeland at \$.125/acre, no action on the recommendation by Congress took place. Grazing homesteads would reduce land available for homesteading. Other than two minor adjustments made much later, in 1909 and 1916 to allow homesteads of 320 and 640 acres, there was no legal way for ranchers to obtain formal title to the land they used. They fenced illegally and the fences were removed by the General Land Office (Libecap, 1981a, 151; 1981b). The other method of limiting entry was to overgraze to make their informal claims less attractive (Libecap, 2007, 273). Overstocking due the lack of property rights and drought led to depletion of the range resource. This depletion subsequently was cited by environmentalists as evidence of the wastes of private exploitation and the need for sustained-yield administrative management.

Potential Claimants: Timber Companies.

A final group that could not obtain property rights to the lands they used were timber companies or lumber operators. Successful lumbering operations also required larger areas than those allowed for small farms under the land laws. To circumvent the restrictions, in the Pacific Northwest in the 1880s through the turn of the 20th century, timber operators hired entrymen to act as homesteaders and to then file for claims and to purchase them under the Timber and Stone Act and other land laws. As with range lands, the Public Lands Commission (1880) called for more liberal property rights provisions for non-agricultural, timber lands. This recommendation was not followed, but rather the forest lands were gradually removed from private claiming and placed under the forest reserves.

V. The Rise of the Conservation Movement and Permanent Government Ownership and Administration of Land.

The Progressive Era, Private Property Rights, and Regulation.

The withdrawal of federal lands from private claiming in the late 19th and early 20th centuries was spear headed by the first environmental or conservation movement (Hayes, 1959). Early conservationists and their political and bureaucratic patrons (conservation/environmentalist leaders became agency heads) challenged the long-standing notion that private property rights and markets were key elements in the development of the American state, economy, and society. Whereas earlier potential land claimants, traders, developers, and associated politicians played key roles in molding colonial and 19th century land laws, members of the conservation movement were quite different. They were urban political and economic elites, trained professionally to manage land, not operate farms, ranches, or timber operations. They were skeptical of the efficacy of private property rights, which in any event, would constrain their managerial latitude and administrative objectives. They saw private markets as inherently wasteful without the remedy of government regulation. Federal lands were the ultimate opportunity because private ownership had not yet taken place and jurisdiction remained with the federal government, if the land laws were revised.

The conservation/environmental movement was part of the Progressive Movement, 1870-1920, that ushered widespread government intervention, ranging from antitrust, pure food and drugs, and conservation. As it turns out, there is little empirical evidence to support any of their claims of market failure. They were driven by philosophical views that were fundamentally different from those of the early founders of the republic and drafters of the land laws. Nevertheless, Progressive Era reformers were well organized, they assembled a coalition of professional groups in support of their plans, and they were supported by key politicians who also sought to advance political agendas. Progressive Era leaders were not only advocates, but became bureaucratic agency heads in administering administrative reform. The claims of market failure not

only justified the withholding of federal lands from further private claiming through the mid-20th century, but established the framework for subsequent 20th and 21st century government environmental regulation.

The rise of the Progressive Era coincided with a shift from a rural, agrarian economy to an urban, more industrial one. The urban share of the population, which had been about 26% in 1870, was 40% by 1900 and over half by 1920 (US Census Bureau). Per-capita incomes had risen generally at about 2% annually in real terms throughout American economic development, so that by 1900 the country was not only more urban, but wealthier, demanding a larger array of more complex consumer goods and recreational opportunities. Most of the population did not depend on access to land for production and income. Production scale to meet new demand grew with lower transportation costs and economies of scale. Large firms dominated in manufacturing, retail, services, often with remote headquarters. Individuals no longer consumed what they produced or observed in production. These large firms displaced the smaller more atomistic, but higher-cost economy that characterized the earlier 19th century.

New production processes and technologies required professionals with training in civil, mechanical, and electrical engineering, chemistry, botany, and biology. These demands led to expansion of academic and professional study and the formation of professional societies, many founded during the 1870s and 1880s along with other organizations--the American Association of Civil Engineers, American Institute of Electrical Engineers, American Society of Mechanical Engineers, American Chemical Society, and American Forestry Association. Increasingly many of these professionals were employed by the federal government as both the size and scope of the federal role in the economy expanded.

Federal civilian employment was 131,208 in 1885, but had grown by 258% to 469,879 by 1913. A growing share of this employment was in the professional, merit-based civil service that gradually developed an independent agenda from their political sponsors for expanded regulatory mandates, salary growth, and provision of tenure (Johnson and Libecap, 1994). Members of professional organizations within the government who examined renewable land and natural resource use emphasized the biological/engineering concept of sustained yield, whereby harvest or extraction would occur at the rate of growth of the stock. Implementation of sustained yield, however, required either government ownership or regulation of private harvest decisions. Sustained yield is not an economic concept, nor does following it necessarily maximize social welfare. Nevertheless, sustained yield has and remains to have strong logical appeal among engineers, scientists, government regulatory officials, and non-government advocacy groups. None of these groups bear the opportunity costs sustained yield imposes, while property owners and consumers do. When it is economically justified, deviation from sustained yield results in economic loss internalized by owners. Adherence to sustained yield, when it is not economically justified, however, also results in economic loss internalized by owners. Bureaucratic officials with tenure and guaranteed salaries, however, do not internalize such costs. General consumers face high

information and organization costs to counter, and if sustained-yield management is advertised as providing public goods, the information costs for critical evaluation rise. Competitive interest groups are required to effectively challenge such claims, but as shown below, early conservationists coopted the parties that might have organized against it. Accordingly, sustained yield was and remains a driving factor in government resource management and it underlies the popular concept of sustainability.

The economic theoretical and philosophical arguments for sustained yield management came with the notion of market failure, externalities and the need for government intervention also developed in the late Progressive Era (Pigou 1920). Welfare economics, externalities, and government remedies are found in Pigou, Baumol (1972), and Meade (1973). Although there are a variety of market failures addressed in the literature, sustained yield is justified by the argument that private agents systematically discount future returns, ignore current social costs, and overestimate future supplies, all leading to over production and resource rent dissipation.

There is a massive historical literature on the Progressive Era, such as by Gould (2001) and others. What is remarkable is how little the basic arguments underlying Progressive Era reforms have been rigorously examined empirically by economic historians and economists. Most of the assertions, especially those regarding the need for government ownership or regulation and tax policy to correct for externalities remains unexamined. In terms of monopolization, for example, there is no evidence of higher prices or reduced product offerings in the economy in the late 19th and early 20th centuries that would have been associated with monopoly output and pricing. Indeed, in real terms, prices either were stable or declined while the range of products available to consumers rose. In terms of product quality and incomplete information that lay behind the passage of the Food and Drugs Act of 1906, Law and Libecap (2006) find little evidence to support the argument that consumer interests and food safety were behind the law. Instead, major drivers were producer interests seeking to use the state to protect market access and share. Similar findings are reported by Libecap (1992) for meat processing and the rise of the Chicago Packers. In the case of the conservation movement, the retention of permanent government ownership and management of federal lands was based on allegations by professional foresters, range managers, aligned with other professional groups that private timber companies and livestock raisers were harvesting too rapidly and plundering the federal lands. In this case as well, there is no supportive empirical evidence for their claims, but clearly more systematic analysis of Progressive Era claims are required.

Sustained Yield Management of Timber Lands.

“...the forest resource is one which, under the active competition of private enterprise, is apt to deteriorate...that the maintenance of continued supplies as well as of favorable conditions is possible only under the supervision of permanent institutions with whom present profit is not the only motive. *It calls preeminently of the state to counteract the destructive tendencies of private exploitation*” [italics]

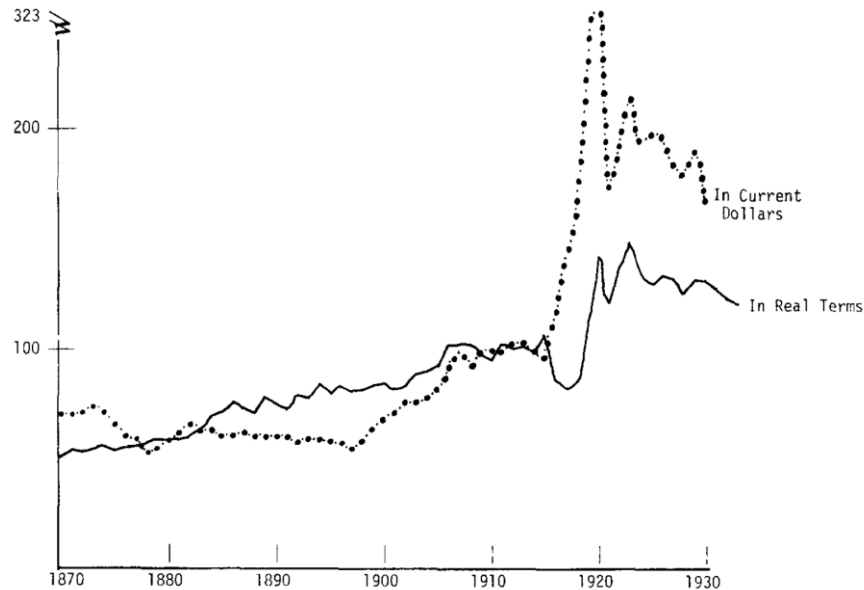
added] Bernhard E. Furnow, drafter of 1891 legislation that established the National Forest Reserves, Chief, Division of Forestry, U.S. Department of Agriculture, 1886 (*Economics of Forestry*, NY: Crowell and Company, 1902, 20, quoted in Johnson and Libecap, 1980, 372).

“Government control of cutting on all timberland, *private as well as public*, [italics added] is still today, as it was then, the one most indispensable step toward assuring a supply of forest products for the future of the United States.” Gifford Pinchot, Chief of the U.S. Forest Service 1890-1910, (*120*, New York, 1947, reprint, Seattle, 1972, p. 120, quoted in Libecap and Johnson, 1979,129).

The continued ownership and management of federal forest lands were the primary focus of early conservationists, such as Pinchot and Fernow, who also later ran the federal agencies that administered them. Educated in Germany in the biological concept of sustained yield, they championed rational, scientific management to achieve it. Private property rights and harvest decisions ran counter to their aims. They pointed to an asserted rapid harvest of white pine stands in Michigan, Wisconsin, and Minnesota as evidence of a lack of future considerations by private interests. If uncorrected, such harvests would lead to a timber famine (Hayes, 1959, 37; Johnson and Libecap, 1980). This was a powerful argument that fit with broader concerns about depletion and upcoming shortages of key resources, such as lumber and coal, that were subject to Congressional hearings in the early 20th century (Sherry Olson, 1971). Because the Great Lakes timber stands were on private lands and already were being harvested by the 1880s and 1890s, attention was directed to “the magnificent forests of the West” that remained under federal ownership and could be withdrawn from private entry and harvest (Samuel T. Dana, 1956, quoted in Johnson and Libecap, 1980,373).

Johnson and Libecap (1980) test the claim that private timber companies were harvesting, ignorant of future supplies. They assemble US lumber prices from 1870-1932 and stumpage prices from 1890-1934 and analyze them to see if price patterns reveal spikes once true supply conditions became apparent to the market. Figure 3 plots time series data for lumber prices and the data do not reveal that stumpage had been underpriced during the period, 1870-1910 when the Great Lakes was being heavily logged and conservationists were so critical. Prices gradually rise through 1915 as domestic demand grew. The rise in nominal prices 1915-1921 is associated with WWI demand and subsequent contraction after the end of the war. There is no major and permanent shift in lumber prices consistent with overestimating supply conditions by timber companies.

Figure 3: US Lumber Prices



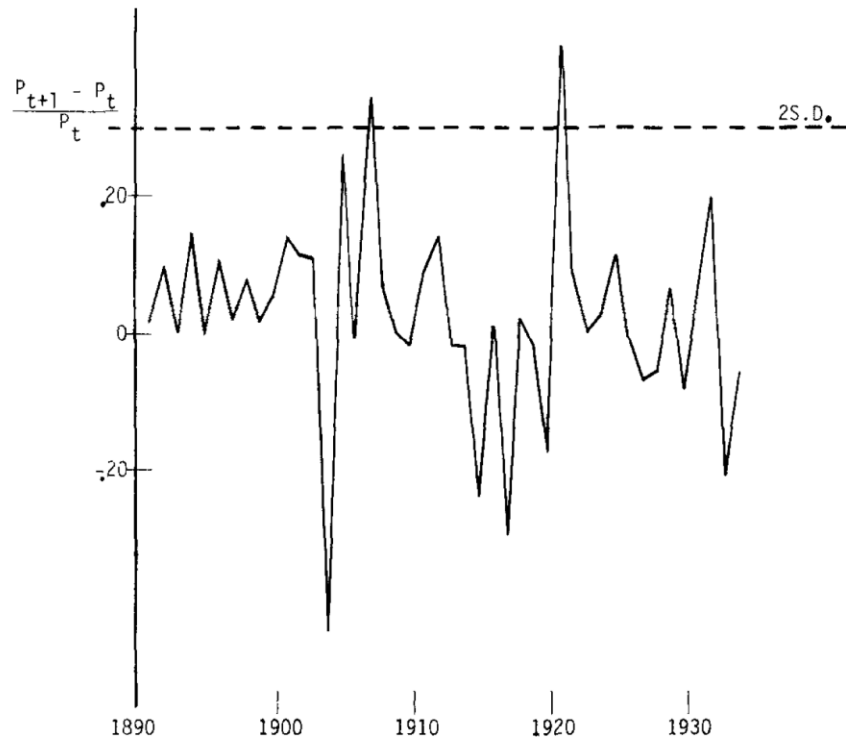
Source: Johnson and Libecap, 1980, 379.

Johnson and Libecap also examine stumpage prices, using western Washington data where old-growth timber dominated and stocks remained relatively homogeneous during the time period examined, 1890-1934. There was a national timber market with Midwestern white pine, southern yellow pine, and Pacific Northwest Douglas fir competing directly. Figure 4 provides a plot of one-period real rates of return for stumpage prices. Had private timber companies been systematically overharvesting, neglecting long-term supply conditions as conservationists argued, then stumpage prices would adjust once actual supply conditions became clear. Moreover, lumber production would fall as companies reduced harvest in order to save now-more-valuable timber stands. The data in Figure 4, however, do not show such patterns. For the most part, one period price changes are well below 2 standard deviations from the series mean. There are two spikes, 1906-1907 and 1920-1921. The first coincides with rising lumber demand and production, not a reduction in output as would be the case had supply been overestimated. The second spike is due to deflating by the wholesale price series during a time when the series took one of its greatest falls in US economic history following the end of WWI.

Further, Johnson and Libecap find that one-period nominal rates of return averaged 4.3%, comparable to observe rates of return on railroad bonds and other securities at the time. There is no evidence, then, that timber companies were overharvesting relative to actual demand and supply, neglecting future stocks, or harvesting in a manner that was not consistent with social welfare. There were no unexploited private gains foregone by too rapid cutting. Private timber companies were harvesting more rapidly than sustainable yield, and had they held to that mandate as conservationists argued, then timber stocks would have been held artificially too high, lumber supplies would have been lower and prices higher, making housing and other building stocks costlier for consumers. It would have reduced real incomes. Such an

outcome would not likely have been in the public interest, despite counter assertions by conservationists that government ownership and regulation were required to advance the public interest. More modern techniques are available for analyzing stumpage and lumber price series movements, but they are unlikely to reverse the findings of Johnson and Libecap (1980) that private timber companies harvested with an understanding of supply conditions.

Figure 4: One-Period Real Rates of Return for Western Washington Timber



Source: Johnson and Libecap, 1980, 382.

Additionally, conservationists also pointed alleged timber theft and rapid harvest in the Pacific Northwest as further evidence of the short-term considerations that drove private timber companies (S.A.D. Putter, *Looters of the Public Domain*, Portland, 1907, rpt. NY, 1972). Libecap and Johnson (1979, 141) examine timber lands claiming in the region and find that the restrictions of the land laws forced use of costly alternatives to achieve ownership that delayed property rights. The use of entrymen and other fraudulent activities to appear in compliance with the land laws added an additional 6 years or more before securing title was cost effective, leaving timber under open access. The source of the problem lay with the land laws and not inherent private harvest practices.

Nevertheless, environmentalists held then and today to the belief that the rate of cut should equal the rate of growth. They used the harvest of Great Lakes timber as evidence of the need for setting aside federal timber land. Sustained yield would have been especially problematic in light of the prevalence of stands of old-growth timber that

were not growing. Other externalities associated with timber harvest, such as greater flood water runoff following timber harvest could have been a legitimate concern. But there is no evidence of such widespread flooding (Johnson and Libecap, 1980, 383).

Bernhard Fernow, head of the Division of Forestry in the US Department of Agriculture from 1886-1898, and followed by Gifford Pinchot who became first Chief of the US Forest Service, 1905-1910, were major leaders in the effort to create the National Forest Reserves, later the National Forests. They were assisted by professional groups, including the Society of American Foresters, the American Forestry Association, National Forest Congress, National Board of Trade, National Irrigation Congress (Hayes, 1959, 30-39). Through their efforts and the backing of Presidents William Harrison, Grover Cleveland, William McKinley, and Theodore Roosevelt, the Forest Reserve Act was passed in 1891, the Forest Management Act of 1897, and the 1905 National Forest Transfer Act that moved the forest reserves from the Department of the Interior to the US Department of Agriculture. Under Roosevelt, the National Forests were expanded to include 150,832,665 acres in 59 National Forests (Hayes, 1959, 39-47). Congress was compliant for reasons outlined below.

Creation of permanent forest reserves was a major reversal from early US land policy. Earlier, the 1880 Public Lands Commission Report, xxxi., called for changes in the land laws to allow for private property rights on timber lands, but this was not the path desired for management under the new administrative state.

Sustained-Yield Management of Federal Range Lands

“The adjustment of a people to its environment can take place through a thoughtless struggle in the survival of the fittest, or it can be a planned, quiet, orderly process of human organization” Annual Report, Secretary of the Interior, Ray Wilbur, 1930, 8, quoted in Libecap, 1981, 156).

“There is perhaps no darker chapter nor greater tragedy in the history of land occupancy and use in the United States than the story of the western range...Unexpectedly and almost overnight it became the potential source of great wealth from livestock raising. And thereon lies the key to the story...the major finding of this report...at once the most obvious and obscure is range depletion so nearly universal...” (US Department of Agriculture, *The Western Range*, 74th Cong., 2nd Session, 1936, Senate Document no. 199, 3).

As with federal timber lands, biologists and other range managers criticized overgrazing of the federal lands as further evidence of the wastes of unregulated, private herding and the need for administrative control and management (Hayes, 1959, 50-54; Libecap, 1981a, 1981b). They did not acknowledge the inability of ranchers to secure property rights to sufficient acreage for viable herds under the land laws. A new Public Lands Commission in 1903 investigated the condition on western range lands and forests and in contrast to earlier Commissions, concluded that permanent scientific management

was required to insure orderly and planned exploitation. There was competition between the Departments of Agriculture and the Interior over which agency would receive jurisdiction, but ultimately the Taylor Grazing Act of 1934 placed administrative control under the Department of the Interior, General Land Office which became the Bureau of Grazing and later, the Bureau of Land Management (Hayes, 1959, 60-67; Libecap, 1981a).

The Absence of a Counter Lobby to the Efforts of Early Environmentalists.

In the lobbying to end the federal land laws and to place the remaining federal lands under lasting bureaucratic management, conservationists coopted the very interests that would have benefited from more flexible mechanisms for obtaining property rights and might have organized as effective counters. Instead, timber companies, herders, and homesteaders *supported* government reservation and management. Pinchot called for multiple use of federal lands, rather than preservation. He and other conservation leaders offered timber companies timber leases and later, subsidized access to forest lands. For the first time, those companies could secure legal right of entry to forests through timber harvest leases. They had only to pay for timber harvest leases and not go through the possibly costlier process of securing title. Similarly, herders who had been using federal range land informally, but illegally, were offered renewable grazing permits within newly-created grazing districts. They were offered renewable grazing permits that could attach to any titled land owned and transfer with such properties should they be sold. Permits were priced low, relative to private lands, although land quality was lower, and subsequently other subsidies in fencing and brush clearing were provided (Libecap, 1981b).

The third group, homesteaders were redirected to federally-funded reclamation sites, following enactment of the Reclamation Acts of 1902 and 1906. The National Irrigation Congresses, the American Society of Civil Engineers, others lobbied for the reclamation laws. Federal provision of dams and irrigation networks were argued to provide opportunities for new homesteaders, and indeed, after 1902, both the number of homestead entries and amount of acreage claimed jumped with totals greater than any earlier period. Homestead claims had to adhere to the 160-acre rule for receipt of federally-subsidized irrigation water. Teele (1904) and Coman (1911) argued that there were network externalities that inhibited private irrigation efforts, also justifying federal irrigation intervention. Leonard and Libecap (2018), however, show that collective action problems were solved privately and document that by 1920, \$697,657,328 (\$823,236,000,000 in 2015 \$) had been invested privately in 109,174 canals and ditches, 159,864 miles long, as well as in 7,538 dams and reservoirs with capacity of 21,246,436 acre feet (to scale, in 2016 California's enormous, mostly government-invested surface storage was just under 50,000,000 acre feet). Wahl (1989) and others have been critical of the distortions caused by ongoing federal subsidies of water to agriculture, flood control, and power generation.

Even so, all three major potential competitors for federal lands failed to mount political lobbying to keep federal lands open. Rather, they accepted what seemed to be low-cost alternatives, sponsored federal support for their efforts. What timber companies, herders, and later homesteaders failed to anticipate was that later, as new demands for federal lands and subsidies emerged for species preservation, recreation, and other environmental applications, their access, use and subsidy would become less secure and subject continued administrative reallocation and regulation.

Table 2 lists the new land laws that authorized and broadened government administration and that removed lands from private patenting that previously had been possible under the land laws listed in Table 1.

Table 2. Land laws regarding the distribution of federal land, and the creation of agencies to regulate forested areas of the United States.

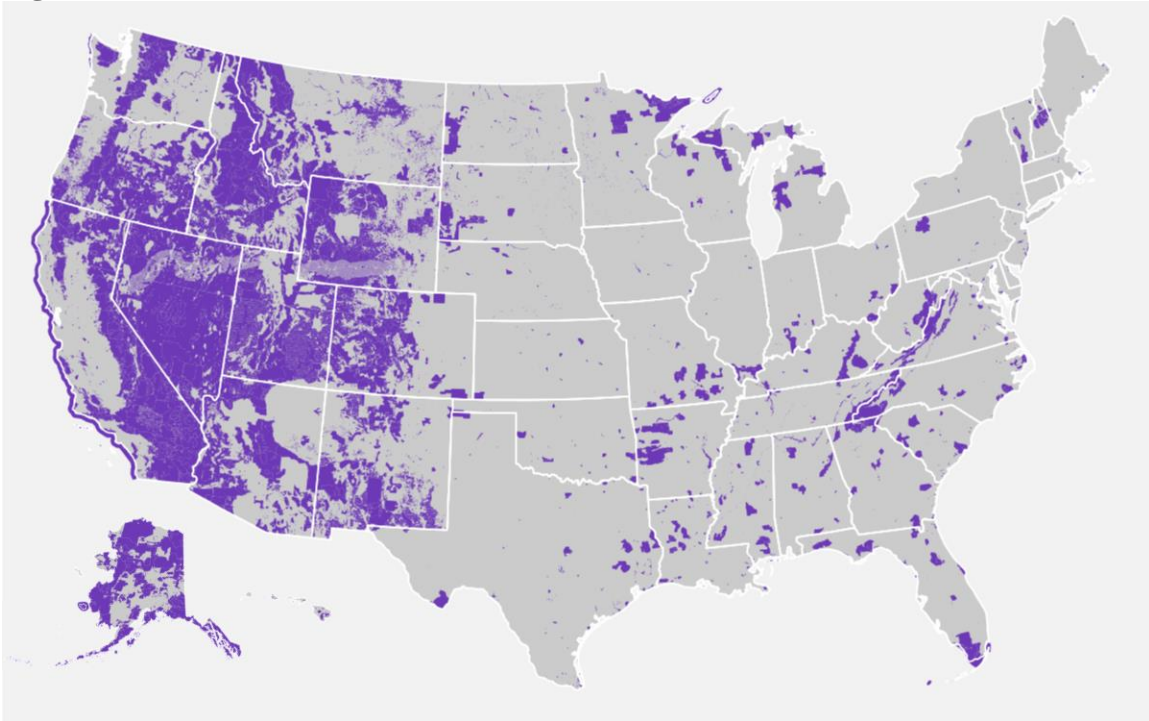
Law	Date	Implications
General Revision Act (Forest Reserve Act)	March 3 1891	Repealed the Timber Culture and Preemption Acts, applied stricter rules for claiming under the Desert Land Act, authorized the President to set aside and permanently reserve government forest lands.
Reclamation Act (Newlands Act)	June 17 1902	Dedicated funds from sale and disposal of federal lands in 16 western states and territories for irrigation projects on withdrawn lands, but available at subsidized rates for homesteading if lands irrigated. Created the Federal Reclamation Service, separate from USGS in 1907 and in 1923, the Bureau of Reclamation.
Transfer Act	February 1 1905	Transferred forest reserves and the duties of the Forest Service from the General Land Office in the Department of the Interior to the Department of Agriculture and US Forest Service.
Mineral Leasing Act	February 25 1920	Withheld mineral lands but authorized the Department of the Interior to issue prospecting permits and production leases.
Taylor Grazing Act	June 28 1934	Set aside federal range lands, ending some homestead claiming; established the Grazing Service, created grazing districts, and authorized the Department of Interior to issue grazing permits. Grazing Service and General Land Office form Bureau of Land Management (BLM) in 1946.
Multiple-Use Sustained-Yield Act	June 12 1960	Broadened constituent access and use of National Forests from initial timber production to include outdoor recreation, range, timber, water, and fish and wildlife. Ended possible privatization.
Federal Land Policy and	October 21 1976	Repealed homesteading and other laws for land disposal enacted in the 19 th century and required

Management Act	multiple use and sustained-yield objectives on BLM and other federal lands.
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Source: Gates (1968). U.S. Department of the Interior, Bureau of Land Management (editor), 2016. The Federal Land Policy and Management Act of 1976, as amended. U.S. Department of the Interior, Bureau of Land Management, Office of Public Affairs, Washington, DC. 106 pp.

Figure 5 shows the land ownership of the federal government today, largely in the western US, administered by the US Forest Service in the Department of Agriculture and the Bureau of Land Management in the Department of the Interior. It is important to point out that areas of extreme, unique natural amenities, such as the National Parks, at least as initially defined, are small portions of the total land area and are not the focus here. Rather attention is on the vast tracks of land that have little amenity value and were subject to unsuccessful claiming efforts under the land laws. Ultimately the federal lands shown in the figure include 188,240,056 in the National Forests under the US Department of Agriculture and grass lands, for a total of 225,592,659 acres (https://www.fs.fed.us/land/staff/lar/LAR2011/LAR2011_Book_A5.pdf). An even larger amount, 247,300,000 acres, mostly of dry rangeland is administered by the Bureau of Land Management in the Department of the Interior <http://bigthink.com/strange-maps/291-federal-lands-in-the-us>. The National Park Service in the Department of the Interior by contrast administers a comparatively small, 27,400,000 acres. All in all, a total of 472, 892,659 acres or 21% of the land area of lower US is owned and managed by the federal government.

Figure 5: Federal Lands.



Source: USGS as adapted in <http://meridianintl.co/us-government-land-map.html>

V. Conclusion: Bureaucratic Management of Federal Lands: Multiple Use and Sustained Yield Act of 1960 (PL 86-517) and Federal Land Policy and Management Act (94-579).

The withdrawal of federal lands from private claiming and titling began with the General Revision Act of 1891 and continuing with the Taylor Grazing Act of 1930, the Multiple Use and Sustained Yield Act of 1960, and Federal Land Policy and Management Act of 1976. These laws assign access and use control to federal bureaucracies. They represent a fundamental shift in the roles of private property rights and the state. With the founding of the republic reliance was placed on individual decisions regarding land use and allocation, decentralized self-reliance, and a minimal role of the state. With the reservation of vast amounts of land by the federal government and permanent administrative management, reliance was transferred to an unelected, professional, and tenured bureaucracy with centralized decision-making authority. The state was elevated over the market. The argument made at the time was that market failure required intervention in the public interest. This same argument drives expansion of federal and state environmental regulation of private property rights and land use in the late 20th and early 21st centuries. At least with the initial reservations of land for the Forest Service and Bureau of Land Management, the argument does not pass empirical test, although more analysis is required. The assertion of externality is taken at face value and promoted by interest groups and by the agencies that benefit from a greater regulatory role. While early access to forest and range lands, as well as reclamation service projects were aimed at existing timber companies, livestock owners, and homesteaders, new allocations are to a wider range of interests—recreation, preservation, wilderness, watershed, wildlife, and fish, along with traditional uses.

How do bureaucratic agencies make such allocation decisions? Where do they assemble the necessary information on new uses and their values to society? Because the stock of land is constant, these decisions necessarily involve reallocation and often greater administrative monitoring by the agencies. These in turn require more autonomous discretion in complex management and distribution issues, less direct oversight by elected politicians, and fewer opportunities for general citizens to critically respond. The federal lands are termed Public Lands to emphasize the public goods provided, but these claims are very difficult for citizens to assess. So long as average costs are low, citizens have little incentive to probe deeply into public goods assertions or specific management actions. But government agencies with long-term, protected bureaucracies have very acute reasons for marshalling supportive interest groups and assembling a complex regulatory structure in the name of public goods provision.

This is the essence of the administrative state that poses direct challenges to type of society, economy, and political structure initially envisioned for the country. Only if competitive interest groups arise to counter the coalition of bureaucratic agencies and sympathetic lobbyists, can general citizens be made more informed to better weigh whether or not public welfare is advanced or reduced by broader governmental regulation

of private property rights and markets in the name of the environment. This is not to say that externalities are not possible, but rather to argue, as Coase (1960) did that solutions involve a variety of options, chief of which is the better definition of property rights to internalize social costs, rather than an immediate leap to regulation, taxes, or ownership by the state. The concept of externality is an elastic one that can be made to justify almost any state intervention. Whether or not such actions are justified requires assessment and evaluation, rather than uncritical acceptance of the call for greater intrusion into the economy and society by an ostensibly benign bureaucracy. The early conservation movement and its achievements in the reservation of federal lands do not pass this test.

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