

WASTE AND THE GOVERNANCE OF PRIVATE AND PUBLIC PROPERTY

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Common law waste doctrine is often overlooked as antiquated and irrelevant. At best, waste doctrine is occasionally examined as a lens through which to evaluate evolutions in modern property theory. We argue here that waste doctrine is more than just a historical artifact. Rather, the principle embedded in waste doctrine underpins a great deal of property law generally, both common law and statutory, as well as the law governing oil and gas, water, and public trust resources. Seen for what it is, waste doctrine provides a fresh perspective on property, natural resources, and environmental law.

In this Article, we excavate the old waste cases in multiple fields of property and natural resources law to make novel connections across these fields and demonstrate the doctrine's continuing relevance for contemporary lawyers, legal theorists, and environmental advocates. The Article is unique in its articulation of a universal "waste principle" and its examination of how this principle facilitates communication and cooperative self-governance by and among owners of common property. It suggests that underenforcement of civil and administrative waste law in the context of common pool natural resources contributes to failures in modern law to respond to pressing environmental challenges.

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INTRODUCTION

Often presented as a minor component of a fossilized common law of property, the doctrine of waste embodies a timeless but underacknowledged principle of conservation that sheds light on contemporary issues in property, natural resources, public trust, and environmental law. These diverse fields are animated by the fundamental challenge of managing the use, conservation, and preservation of common resources like land, oil, water, and air. Stretching back to the early common law, the law in these areas has adhered to a consistent principle to solve problems of common ownership—the “waste principle.” Understanding this principle illuminates the connections among these bodies of law and the relationship between private ownership and public regulation.

This Article unearths the waste principle as a foundational, though long-neglected, concept of American law. By unpacking waste cases across various doctrines, the Article demonstrates that the principle is an integral component of a liberal system of natural resources and environmental governance. The principle furnishes a common law antidote to current problems like regulating the atmosphere, curtailing natural gas venting and flaring, and addressing contamination by unregulated pollutants. In contrast to the current body of administrative environmental law, which is subject to fragmentation, obsolescence, and political instability, the waste principle is poised to address those problems head-on. If given effect in practice, the waste principle could provide a simple and powerful supplement to regulation to help manage pressing issues regarding resource allocation, overuse, and environmental degradation.

The waste¹ principle holds that the law should prohibit negative-sum (or “wasteful”) uses of property to the extent that the self-interest of the owner or owners cannot be expected to systematically produce this result in the absence of any legal restriction.² Negative-sum uses of common property are those that produce fewer gains to the user than losses in welfare or net utility to other common owners (“commoners” or “common

1. The “waste” discussed in this Article pertains to the subtractive use of shared assets and not to negative-value goods or worthless byproducts like nuclear waste.

2. Nuisance doctrine and public law operate as external governance mechanisms to limit externalities that the owner’s use imposes on third parties; a fee owner of wasted property suffers its own sins.

owners”).³ When resources are held as common property, whether among a small or a vast group of claimants, the waste principle forbids uses that reduce the property’s total net utility to the commoners as a group.⁴ As such, doctrines prohibiting waste provide a mechanism for internal governance by limiting the negative externalities that common owners may impose upon each other. When the principle is violated, the law provides legal and equitable remedies that require the defendant to incur the costs of losses to utility or to curtail excessive use of the resource. This basic underlying function of waste law constrains the self-interests of current owners, preserving reciprocal obligations regarding the use of property and preventing senseless losses to co-owners and the public alike.

Articulating a consistent formulation of what constitutes “waste” is difficult because it manifests in a broad array of legal contexts across contract, property, corporate, trust, and public law. Few scholars have devoted careful attention to the details of the doctrine’s different manifestations.⁵ Instead, scholars have unpacked the waste doctrine within single fields of property law, such as life estates and leasehold interests,⁶ oil and gas law,⁷ water law,⁸ and the common law right to destroy private property.⁹ On their surface, these doctrines may appear to share

3. Richard Posner has observed this basic function of waste in the life tenant–remainder context. Richard A. Posner, *Comment on Merrill on the Law of Waste*, 94 MARQ. L. REV. 1095 (2011).

4. Although often considered in economic terms, the concept of utility within the waste principle conveys an appropriately vague notion of satisfaction that embraces both evolving social values regarding conservation and resource use as well as traditional, quantifiable economic values.

5. Notable exceptions include Jill M. Fraley, *A New History of Waste Law: How a Misunderstood Doctrine Shaped Ideas About the Transformation of Law*, 100 MARQ. L. REV. 861 (2017); Michael Pappas, *Anti-Waste*, 56 ARIZ. L. REV. 741 (2014). While prominent scholars have used certain waste doctrines as a lens through which to view larger developments in American law, these studies do not engage in a multi-field analysis. See Fraley, *supra*; see also Jedediah Purdy, *The American Transformation of Waste Doctrine: A Pluralist Interpretation*, 91 CORNELL L. REV. 653 (2006); Thomas Merrill, *Melms v. Pabst Brewing Co. and the Doctrine of Waste in American Property Law*, 94 MARQ. L. REV. 1055 (2011).

6. See Posner, *supra* note 3.

7. *E.g.*, George D. Schrader, *Oil and Gas—Waste of Oil and Gas as Between Adjacent Landowners*, 44 KY. L.J. 118 (1955).

8. *E.g.*, A. Dan Tarlock, *The Legacy of Shodde v. Twin Falls Land & Water Company: The Evolving Reasonable Appropriation Principle*, 42 ENV’T L. 37 (2012); Steven J. Shupe, *Waste in Western Water Law: A Blueprint for Change*, 61 OR. L. REV. 483 (1982).

9. *E.g.*, Lior Jacob Strahilevitz, *The Right to Destroy*, 114 YALE L.J. 781, 787 (2005).

nothing but a name. Undeniably, each carries the unique *gout de terroir* of its legal context. Viewed together, however, these doctrines are bound by a common purpose—the conservation and governance of commonly owned resources by disincentivizing negative-sum uses, consistent with the waste principle—which is apparent only when they are studied together.

Examining waste across its various iterations reveals that common law prohibitions against waste are strongest where common property results from operation of law or because of the natural physical attributes of the resource. Conversely, such waste prohibitions are weaker where common ownership arises voluntarily through grant or contract. For this reason, the waste principle is also embedded in the public-trust doctrine.¹⁰ In each of these contexts, the judicial doctrine of waste prevents monopolization and ensures all commoners a fair opportunity to access and exploit the resource. Among private owners, this distributes potential control equally among rights holders in a manner consistent with a liberal system of private property and self-governance, encouraging autonomy among individual owners except where necessary to prevent the most egregious negative-sum harms.

Moreover, as we encapsulate in Part V.A of the Article, a contextualized analysis demonstrates that as resources become scarcer or the number of commoners increases, common law waste doctrine is often supplanted by provisions of contract and public regulation, in part because statutory and contractual provisions tend to be more definite and easier to enforce. For resources with relatively few owners, such as land owned in concurrent or successive estates, owners frequently formalize their relationships by contract (including by forming trusts and corporations to hold property), while legislatures sometimes also adopt particularized statutes to enforce the vagaries of the judicial doctrine. Common pool natural resources follow a similar arc. Growing demand tends to lead to greater and more particularized antiwaste regulation. Because common pool resources are distributed widely among many owners, statutory and administrative regulation develop to overcome the coordination

10. The public-trust doctrine functions as a public-law analog to the private-law doctrine of waste by regulating the use of public trust resources, such as wet sand beaches and submerged lands, which the public shares by virtue of their physical attributes.

problems that stymie effective enforcement of judicial waste doctrine.

Uncovering the underlying principle reveals the theoretical and normative significance of waste to the fields of property, natural resources, and environmental law. The waste principle constitutes an integral part of a liberal common law framework for governing shared resources among owners and across time by placing resource-use decisions principally in the hands of individual owners rather than in a centralized regulator.¹¹ Conceptually, the principle creates an accountability mechanism through which courts can remedy injuries and establish norms and standards that are necessary to well-functioning and adaptive statutory and administrative systems. In practice, however, courts often fail to effectively enforce waste doctrines, even when they have been codified by statute, instead deferring to public administration. This ignores waste as a useful, abstract legal concept with applicability independent of its manifestations within individual legal fields. Moreover, lack of enforcement may contribute to the impression among courts, lawmakers, advocates, and scholars that advancements in law and technology have rendered common law waste anachronistic and expendable and that the most pressing and complex environmental issues must be addressed solely through political processes.

On the contrary, disregard of the waste principle *itself* contributes to the failure of modern property theory and regulation to address contemporary environmental problems. Absent consistent judicial enforcement of the waste principle, policymakers and legal scholars have been quick to embrace statutory and regulatory solutions to commons and environmental issues. Environmental regulation has proliferated accordingly and, without a flexible and generally applicable principle to guide it, has taken on a fragmented, byzantine, and stultifying nature that is itself prone to obsolescence. In short, the common law of waste remains relevant, if forgotten. Faced with resource-scale problems, such as flaring and water contamination, its forward-looking perspective and unique function of allocating value to the utility of natural resources to future users renders it essential. Understanding waste law as a manifestation of a deeper principle of liberal self-governance is a necessary step toward

11. See Hanoch Dagan & Michael A. Heller, *The Liberal Commons*, 110 YALE L.J. 549, 552–54 (2001) (describing liberal values in the context of commons property).

reengaging common law courts in the cause of environmental and natural resources management.

This study of waste law proceeds as follows. Part I surveys the historical origins of the doctrine of waste. Part II delves into waste's manifestations in the fields of private property and concurrent and successive estates in land. Part III considers the operation of waste in inherently common pool natural resources like oil, gas, and water. Part IV demonstrates the analogy between waste doctrine in the private-law context and the public-trust doctrine of public law. Part V summarizes the waste principle, connects it with leading contemporary liberal theories of property, and highlights its potential contribution to environmental and natural resources management.

I. THE WASTE PRINCIPLE IN HISTORICAL CONTEXT

Since the colonial period, the concept of waste has been instrumental in shaping American law relative to both the acquisition of property and its governance between multiple owners. Early commentators referred to undeveloped land in a colony or territory as “waste and uncultivated territory.”¹² Waste was land left wild. Locke wrote of the “uncultivated waste of America” when referring to unused land that was disconnected from commerce and had not been enclosed or put to commercial or economic gain.¹³ Driven by an antiwaste ethos, the providential settlement imperatives of the time took on the character of

12. *E.g.*, JAMES KENT, COMMENTARIES ON AMERICAN LAW 212 (John M. Gould ed., 14th ed. 1896).

13. JOHN LOCKE, TWO TREATISES OF GOVERNMENT AND A LETTER CONCERNING TOLERATION 133 (Ian Shapiro ed., Yale Univ. Press 2003) (1689); JEDEDIAH PURDY, AFTER NATURE: A POLITICS FOR THE ANTHROPOCENE 76 (2015); WILLIAM CRONON, CHANGES IN THE LAND: INDIANS, COLONISTS, AND THE ECOLOGY OF NEW ENGLAND 56 (Hill & Wang 2003) (1983). The dark corollary of this philosophy was that early settlers interpreted intermittent or seasonal possession as inadequate to establish title by possession and, based on these perceptions of spoilage and underuse, colonialists and courts alike justified the dispossession and expropriation of native property. See Jill M. Fraley, *Climate Change, Sustainability, and the Failure of Modern Property Theory*, 104 MARQ. L. REV. 93, 108–11 (2020) (discussing Carol Rose, John Locke, and the value of “speaking clearly and distinctly about one’s claims to property” while also noting antiwaste bias in *Johnson v. McIntosh*, 21 U.S. 543 (1823)); STUART BANNER, HOW THE INDIANS LOST THEIR LAND: LAW AND POWER ON THE FRONTIER 21–22 (2007) (citing Robert Cushman, *Reasons and Considerations Touching the Lawfulness of Removing out of England into the Parts of America, in A RELATION OR JOURNAL OF THE BEGINNING AND PROCEEDINGS OF THE ENGLISH PLANTATION SETTLED AT PLIMOTH* (Dwight B. Heath ed., Corinth Books 1963) (1622)).

religious fervor.¹⁴ Transformation of land from wilderness to garden was perceived as “divinely ordained and wholly positive.”¹⁵ Unsurprisingly, policymakers of this era favored rules incentivizing development and structuring ownership of resources based on development of markets and productive use. These rules shared a common bias that unallocated and undeveloped resources should be possessed and developed for the highest economic good.¹⁶

Concurrently, waste law also operated as a fundamental limitation on the scope of property, limiting rights of possession and appropriation relative to other claimants and prohibiting negative-sum uses among owners of shared property. While the failure to use land could be considered waste, so could its inefficient or purposeless use to the detriment of others. Here, too, Locke wrote that allowing property to go to waste by using or taking more than could be efficiently used “offended against the common law of nature” and “invaded his neighbor’s share.”¹⁷ In this respect, the law of waste stood athwart cultural norms of development. While applying minimally to property held in undivided fee ownership, it largely constrained a tenant’s self-interest in exhausting resources and changing the use of divided property. Although tenants were permitted customary *estovers* necessary to the enjoyment of the land, the early American law of waste, like its English counterpart, required preservation of natural resources on divided property.¹⁸ Thus, waste doctrine ran contrary to deliberate public policies of frontier economics, which were designed to encourage timber clearing and mineral extraction. Instead, waste manifested as rules requiring reasonable use and good husbandry.¹⁹ This same concept has been woven into legal doctrines across a variety of areas, among them

14. PURDY, *supra* note 13, at 154–55.

15. CRONON, *supra* note 13, at 5.

16. *Id.* While Locke noted that the appropriate right in common property was limited to the extent that there was “enough, and as good” left for others, the perception in frontier economics that the “free gifts of nature” were unlimited largely obscured this concept in early American history. Susan P. Liebell, *The Text and Context of “Enough and as Good”: John Locke as the Foundation of an Environmental Liberalism*, 43 *POLITY* 210, 217 (2011); see also J.S. Furnivall, *Land as a Free Gift of Nature*, 19 *ECON. J.* 552 (1909).

17. LOCKE, *supra* note 13, at 140.

18. See *infra* Section II.B.2.

19. See *infra* Section II.B.2.

contracts,²⁰ land titles,²¹ lost and mislaid property,²² adverse possession,²³ fiduciary duties,²⁴ and game hunting.²⁵

Waste law has evolved in response to dynamic changes in perspective regarding value and utility, though its mechanisms of civil law and public administration remain constant. As resources grew scarcer, courts and legislatures relied on waste's utilitarian and efficiency attributes to limit the fruitless or inefficient exhaustion of resources. Progressives in the conservation movement recast waste as "any system or process that failed to get the most value from its materials, whether those were minerals, trees, or human bodies and energy."²⁶ A flurry of new laws and policies relating to water, oil and gas, timber, wildlife, and rangelands followed.²⁷ These laws endeavored to protect the individual "frontier" spirit and entrepreneurship of smallholders by balancing capture-based property rules with scientific management. As ecological understanding of resources and the environment has deepened, legislatures and courts have reframed waste law to consider the social utility of ecological and natural resources to further stewardship and sustainability.²⁸ Courts and regulators increasingly apply regulatory schemes set up during the conservation movement toward keeping water in its channels and oil and gas in the ground for the sake of environmental preservation.²⁹

Through this Article's survey of waste law's applications across property law, a picture emerges of a consistent "waste principle" that incorporates both public and private elements.

20. *Jacob & Youngs v. Kent*, 129 N.E. 889, 889 (N.Y. 1921).

21. See Terry L. Anderson & Peter J. Hill, *The Race for Property Rights*, 33 J.L. & ECON. 177, 177–97 (1990).

22. STEVEN SHAVELL, FOUNDATIONS OF ECONOMIC ANALYSIS OF LAW 44 (2004).

23. *Id.* at 73.

24. See, e.g., GA. CODE ANN. § 53-12-246 (2010); N.C. GEN. STAT. § 55-8-30 (1995); COLO. REV. STAT. § 7-108-401 (2019); CONN. GEN. STAT. § 34-338 (1997); 805 ILL. COMP STAT. 180/15-3 (1998).

25. ME. STAT. tit. 12, § 11224 (2007); TEX. PARKS & WILDLIFE CODE § 62.011 (West 1975); ALASKA STAT. § 16.30.010 (1949).

26. PURDY, *supra* note 13, at 164.

27. See discussion *infra* at Sections III.A.2 and III.B.2.

28. Fraley, *supra* note 5, at 864; James P. Karp, *A Private Property Duty of Stewardship: Changing Our Land Ethic*, 23 ENV'T L. 735, 749 (1993).

29. See *infra* notes 224–230 and accompanying text (discussing instream-flow regulation); *infra* notes 169–171 and accompanying text (discussing amendments to the definition of waste in Colorado's Oil and Gas Conservation Act); Bryan Leonard, et al., *Allow "Nonuse Rights" to Conserve Natural Resources*, 373 SCIENCE 958 (2021).

While not a rule of value maximization, waste doctrine imposes obligations of stewardship and good husbandry by limiting value-destroying and purposeless use. It is an outer bound on the right to use property, which ties together the fates of short- and long-term interest holders and clarifies the decision-making authority between them. By providing an accountability mechanism through the courts, waste encourages cooperation and self-governance through contract by constraining indifference. In common pool resources, such as oil and gas and water, it inherently limits the scope of the property interest by preventing over-use that would block other commoners from enjoying their share. As the scale of a shared resource or the social importance of its common nature increases, waste doctrine operates increasingly in conjunction with public regulation and administration to resolve problems among divergent interests and account for evolving concepts of utility based on changing values and technologies.

II. WASTE AND LAND LAW

In land law, the waste principle has evolved to limit the use of real property across several ownership contexts. This Part examines the principle across those contexts in turn. First, Section II.A examines how the waste principle may limit the generally broad rights of single owners to waste their property when doing so would arbitrarily deprive the public of the property's cultural value. Likewise, the waste principle may prevent concurrent property owners from wasting their property when doing so would prevent co-owners from enjoying the benefits of the land. Section II.B examines limitations on concurrent and successive landowners in turn. Section II.C describes these common law doctrines as a component of the modern governance of waste among owners of divided property and details their incorporation into statutory supplementation of common law rules.

A. Waste as a Limitation on the Single Owner's Right to Destroy Private Property

The role of the waste principle is to limit negative-sum³⁰ uses of property when the owner's self-interest cannot be

30. See *supra* notes 2–4 and accompanying text.

expected to systematically produce this result. While most often applied to protect the rights of other owners in shared property or a common resource, in rare cases, waste may operate to limit the right of an individual owner in order to prevent net losses to society. This is perhaps most apparent where waste limits the right of a single owner to have her property destroyed post-mortem.

Ownership of property generally includes the right to destroy it for any reason or no reason at all.³¹ Some modern precedents, however, have chipped away at the right to destroy based on a public policy forbidding waste.³² In narrow and infrequent cases, courts have enjoined the executor of a decedent's estate from destroying property of the estate according to instructions in the will. In *Eyerman v. Mercantile Trust Co.*, the court held that a testamentary instruction to destroy the decedent's home in an "area of high architectural significance" violated public policy.³³ Noting that "[n]o benefits are present to balance against this injury,"³⁴ the court wrote that "[a] well-ordered society cannot tolerate the waste and destruction of resources when such acts directly affect important interests of other members of that society."³⁵ Compare *Eyerman* with *National City Bank v. Case Western Reserve University*, another case involving a will wherein the decedent instructed the executor to destroy a historically and architecturally unique

31. Under Roman law, property rights consisted of the *jus utendi, fruendi, et abutendi*—the rights to use the property, to enjoy its income, and to completely consume or destroy it. Strahilevitz, *supra* note 9, at 787–88. American law incorporated *jus abutendi* as the "right to destroy." *Id.*; 3 WILLIAM BLACKSTONE, COMMENTARIES ON THE LAWS OF ENGLAND 223–24 (4th ed., 1770) ("If a man be the absolute tenant in fee-simple . . . he may *commit whatever waste* his own indiscretion may prompt him to, without being impeachable or accountable for it to anyone." (emphasis added)); see Roscoe Pound, *The Law of Property and Recent Juristic Thought*, 25 AM. BAR ASS'N J. 993, 997 (1939).

32. See generally Strahilevitz, *supra* note 9, at 796–821 (discussing modern legal limitations on the destruction of property, including the property of decedents' estates).

33. *Eyerman v. Mercantile Tr. Co.*, 524 S.W.2d 210, 217 (Mo. Ct. App. 1975).

34. *Id.*

35. *Id.*; see Will of Pace, 400 N.Y.S.2d 488, 491 (Sur. Ct. 1977) (holding invalid as against public policy a testator's "capricious" direction to demolish two houses); see also Bd. of Cnty. Comm'rs of Rice Cnty. v. Scott, 93 N.W. 109, 109 (Minn. 1903) ("We assume, for the purpose of this decision, that the direction in the codicil to the executor to destroy all of the residue of the money or cash or evidences of credit belonging to the estate was void.").

property.³⁶ Unlike in *Eyerman*, however, the decedent's long-time attorney testified that the decedent wanted the house razed because it was sentimentally important to her, and she did not want it to be converted to commercial use.³⁷ Distinguishing *Eyerman*, the *National City Bank* court explained the instant case "is not one involving an unexplained testamentary direction to destroy" and upheld the decedent's will.³⁸

While scholars have explained why some assets may or may not be destroyed based on the magnitude of positive externalities they produce for third parties,³⁹ *Eyerman* and *National City Bank* cannot be distinguished from one another on this basis—both houses apparently produced significant positive externalities for the community. Whereas the *Eyerman* plaintiff ordered her property destroyed for no reason at all, the *National City Bank* plaintiff sought to protect her sentimental interests in the property. That interest, regardless of whether it outweighed the losses of destruction, was sufficient to preserve the owner's right to destroy. Rather than limiting only grossly harmful destruction of property, waste limits *purposeless* destruction of private property of any magnitude by owners.⁴⁰ In sum, the doctrine or public policy of waste ensures some beneficial purpose to the destruction of private property when such a purpose cannot be presumed because the owner will not internalize the resulting losses.

Governments have adopted historic-preservation statutes as a public-law complement to waste.⁴¹ In addition to state and federal registry laws identifying historic properties,⁴² state statutes also empower local governmental bodies to limit destruction or substantial modification of properties with significant

36. *Nat'l City Bank v. Case W. Rsr. Univ.*, 369 N.E.2d 814 (Ohio Ct. Com. Pl. 1976).

37. *Id.* at 816–17.

38. *Id.* at 818.

39. See Strahilevitz, *supra* note 9, at 822 ("Where a structure retains genuine historical or architectural value and has been landmarked through the ordinary processes, destruction is plainly undesirable."); JOSEPH L. SAX, PLAYING DARTS WITH A REMBRANDT: PUBLIC AND PRIVATE RIGHTS IN CULTURAL TREASURES 9–10 (1999) (arguing that the cultural value of fine art, architecture, important papers, and antiquities precludes their destruction); Pappas, *supra* note 5, at 765–66 (justifying anti-destruction limitations based on the importance of certain property to the dignity of a community).

40. RESTATEMENT (SECOND) OF TRUSTS § 124 cmt. g (AM. L. INST. 1959).

41. See Paul E. Wilson & H. James Winkler, *The Response of State Legislation to Historic Preservation*, 36 L. & CONTEMP. PROBS. 329, 330–31, 339–40 (1971).

42. 36 C.F.R. § 60.4 (1981); RI STAT. § 42-45-5 (West 2021).

historical and architectural values.⁴³ Designation of property as a landmark under such a law generally prohibits its present and future owners from destroying or materially altering it, either by *inter vivos* or testamentary act.⁴⁴ Such laws go beyond merely codifying the policy against waste: they impose stricter limits on private rights of ownership in a specific building, often in addition to zoning and historic-district laws generally applicable to property in the area.⁴⁵

As particular property grows in social importance, the likelihood that regulatory provisions will be adopted to preserve it from destruction also grows. At a critical point, the owner's private interest in the property yields to the public's interest, as expressed by legislation, subject to the protections of due process and the Takings Clause.⁴⁶ While historic-preservation laws embody and complement the waste principle with respect to a narrow set of social values, they do not obviate the common law role of waste regarding destruction of property. The waste principle more broadly permits courts to consider a range of disparate values on a case-by-case basis to determine the precise set of circumstances in which the public interest could outweigh an owner's right to destroy.

B. Waste Between Concurrent and Successive Interests

Beyond its very limited application in the single-owner context, the doctrine of waste is central to governing the relationships between concurrent and successive owners of property. Fragmentation of property, whether vertical, horizontal, or temporal, creates incentives for inefficient use.⁴⁷ Accordingly, whereas a fee owner enjoys the right to waste property, fragmentation of the interest gives rise to an implied obligation to

43. *See, e.g.*, IN. CODE ANN. § 36-7-11-10 (West 2021); N.Y.C., N.Y., ADMIN. CODE Ch. 3, §§ 25-301 to 25-321 (West 1985).

44. *See, e.g.*, CHI., ILL., MUN. CODE art. XVII, § 2-120-580(1) (1987). Tracking the doctrine of permissive waste, some historic-preservation laws may additionally include affirmative maintenance obligations to prevent demolition by neglect. *See, e.g.*, N.C. GEN. STAT. § 160A-400.14(b) (2006); *Maher v. City of New Orleans*, 516 F.2d 1051, 1066–67 (5th Cir. 1975).

45. *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104 (1978).

46. In some limited cases, members of the public may have standing to challenge administrative approvals to destroy or modify historic property where they can demonstrate injury greater than that to the public at large. *See Allison v. N.Y.C. Landmarks Pres. Comm'n*, 944 N.Y.S.2d 408, 412 (Sup. Ct. 2011).

47. RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* 71 (4th ed. 1994).

preserve the fee.⁴⁸ The doctrine of waste evolved to reconcile divergent interests by requiring parties in possession to manage the property “as if [they] were the [single] owner.”⁴⁹ It protects rights and prevents ignored responsibilities so that no owner can deprive the others of productive elements of the property. This Section analyzes common law and statutory waste claims between two classes of owners of divided interests: (1) cotenants and (2) life tenants and remaindermen.

1. Concurrent Interests

Regardless of their percentage of ownership, the common law of most states provides that cotenants in land each possess an equal right to reasonably use and occupy the property as necessary to enjoy the benefit and value of ownership.⁵⁰ The common law protects the right of one or more cotenants to unilaterally use the shared property without the consent of their fellow owners, except where the use would result in ouster or waste.⁵¹ In most cases, however, there is no action for waste where one cotenant uses more than its proportionate share. Instead, a cotenant in possession owes an accounting to other owners for their share of profits.⁵² Even disproportionate use is not waste. Waste requires something more egregious: behavior that exceeds the scale of use expected for the property to such an extent that it unreasonably diminishes the fair rights of use by other owners.

48. MARSHALL DEES HARRIS, ORIGIN OF THE LAND TENURE SYSTEM IN THE UNITED STATES 10 (1953).

49. POSNER, *supra* note 47, at 73. Whereas a single owner’s self-interest most often aligns with preserving long-term value, where property is shared either successively or concurrently, each individual owner may be motivated to extract maximal value for itself to the detriment of others. Thus, waste law intervenes more forcibly to prevent inefficiencies in the concurrent/successive interest than it does where an owner has an undivided fee. *See* discussion accompanying *infra* notes 68–72.

50. *See* *Morga v. Friedlander*, 680 P.2d 1267, 1270 (Ariz. Ct. App. 1984); *Spiller v. Mackereth*, 334 So. 2d 859, 862 (Ala. 1976).

51. *See* *Morga*, 680 P.2d at 1270; *Spiller*, 334 So. 2d at 862; *Jasper Land Co. v. Manchester Sawmills*, 96 So. 417, 419 (Ala. 1923).

52. *See* *Collins v. Jackson*, 517 N.E.2d 269 (Ohio Ct. App. 1986); *Williams v. Bruton*, 113 S.E. 319 (S.C. 1922); *Darden v. Cowper*, 52 N.C. (7 Jones) 210 (N.C. 1859).

Whether a use of property constitutes waste depends on the nature of the property interest.⁵³ What a court considers waste for one estate, it may consider reasonable use for another. For instance, because a mineral estate “can only be enjoyed by removing the products thereof”⁵⁴ under the common law, one mineral cotenant could not sue another for waste resulting from production of the minerals.⁵⁵ In cases regarding coal,⁵⁶ oil and gas,⁵⁷ timber lands,⁵⁸ and mining,⁵⁹ courts have considered extraction and sale of natural resources to be the “use [rather] than the destruction of the estate.”⁶⁰ Use consistent with the nature of the property does not make a cotenant a tortfeasor.⁶¹ Instead, a cotenant making unilateral use of property is liable to the other cotenants for “what he has received in excess of his just proportion.”⁶²

While the law protects cotenants’ rights of use, it prohibits that which injures or destroys. A cotenant may not unilaterally use the property in a manner that diminishes its utility to other common owners.⁶³ To do so would permit one owner to monopolize the property at the expense of the others. For instance, waste may prohibit a cotenant in fee from cutting all the standing timber on shared property.⁶⁴ Although cutting timber for use on a farm may be consistent with use and enjoyment of property, denuding the land entirely is “destructive . . . of the value of the

53. See 1 EUGENE KUNTZ, A TREATISE ON THE LAW OF OIL AND GAS § 5.3 (1987).

54. *Prairie Oil & Gas Co. v. Allen*, 2 F.2d 566, 571 (8th Cir. 1924). *But see* *Law v. Heck Oil Co.*, 145 S.E. 601 (W. Va. 1928).

55. *Chosar Corp. v. Owens*, 370 S.E.2d 305 (Va. 1988); *Elwell v. Burnside*, 44 Barb. 447 (N.Y. Gen. Term 1865).

56. See, e.g., *Karst-Robbins Coal Co. v. Arch of Ky., Inc.*, 964 S.W.2d 419 (Ky. Ct. App. 1997).

57. See, e.g., *Briggs v. Sw. Energy Prod. Co.*, 224 A.3d 334 (Pa. 2020).

58. See, e.g., *Quigley Furniture Co. v. Rhea*, 76 S.E. 330 (Va. 1912).

59. See, e.g., *Frew Run Gravel Prods., Inc. v. Town of Carroll*, 518 N.E.2d 920 (N.Y. 1987).

60. *McCord v. Oakland Quicksilver Mining Co.*, 27 P. 863, 865 (Cal. 1883).

61. *Neel v. Neel*, 19 Pa. 323 (1852); *Sanders v. Robertson*, 57 Ala. 465, 471 (1876); *Morga v. Friedlander*, 680 P.2d 1267, 1270 (Ariz. Ct. App. 1984).

62. *McGahan v. Nat’l Bank of Rondout*, 156 U.S. 218, 236 (1895) (internal citations omitted).

63. *Woods v. Early*, 28 S.E. 374, 376 (Va. 1897); *Jasper Land Co. v. Manchester Sawmills*, 96 So. 417, 419 (Ala. 1923).

64. *Murray v. Fowler*, 88 So. 849 (Ala. 1921); *Hardman v. Brown*, 88 S.E. 1016 (W. Va. 1916).

estate, and not consistent with a prudent enjoyment by the real owner[s].”⁶⁵

2. Successive Estates and Future Interests

The most studied iteration of the waste doctrine protects future interests by limiting a present possessory tenant’s use of land. It governs the relationship between life tenants and reversioners or remaindermen.⁶⁶ This doctrine “forbids the tenant for life from permanently diminishing the property value by acting contrary to how a reasonably prudent person would act to preserve his own property.”⁶⁷ Owners of present and future interests in property often have divergent economic interests.⁶⁸ A life tenant may engage in short-term thinking and profit-maximizing behavior; the remainderman hopes to maximize the property’s long-term value. Successive and future estates may be created by contract (e.g., leases), where it is relatively easy for parties to negotiate management of the property, or by testamentary devise⁶⁹ or operation of law.⁷⁰ In the latter cases, it is more difficult for the parties to contract for common management, particularly if future interests are held by children or the unborn.⁷¹ The doctrine of waste developed to address these

65. *Hawley v. Clowes*, 2 Johns. Ch. 122, 123 (N.Y. Ch. 1816).

66. When referring to future interests, we use *reversion* and *remainder* interchangeably. Although at common law the doctrine of waste did not extend to contractual relationships between tenants and landlords, or mortgagees and mortgagors, courts and statutes have since extended the right to sue for waste to these other classes of successive interests, though the remedies available may be more limited. See George W. Kirchwey, *Liability for Waste. I. At Common Law*, 8 COLUM. L. REV. 425 (1908); Jill M. Fraley, *Modern Waste Law, Bankruptcy, and Residential Mortgages*, 41 CARDOZO L. REV. 485, 488–89 (2019); Malone & Foote v. Marriott, 64 Ala. 486, 493 (1879); Marsha Baumgarner & Michael Hentrel, *What a Waste! What’s a Prudent Lender to Do?*, 5 BUS. L. BRIEF (AM. U.) 10 (2008).

67. *Reel v. Reel*, 23 N.E.3d 309, 312 (Ohio Ct. App. 2014). The doctrine is deeply rooted in the Roman law of usufructs and the English common law, originating in the Magna Carta and chivalry statutes, which later carried over to early American law. For an overview of the origins of waste law, see Sally Brown Richardson, *Reframing Ameliorative Waste*, 65 AM. J. COMPAR. L. 335, 341 (2017); Paul Babie, *Magna Carta and the Forest Charter: Two Stories of Property*, 94 N.C. L. REV. 1431, 1454 (2016); WILLIAM CRUISE, A DIGEST OF THE LAWS OF ENGLAND RESPECTING REAL PROPERTY 67 (1804); Note, *Recent Cases – Waste – Permissive Waste – Whether Tenant for Years Liable for Treble Damages*, 22 HARV. L. REV. 140, 149 (1908).

68. POSNER, *supra* note 47, at 73–74.

69. *Id.*

70. *Id.*

71. *Id.*

inefficiencies.⁷² In this area, there are three kinds of actionable waste: (1) voluntary, (2) permissive, and (3) ameliorative.⁷³ Collectively, the cases between current and successive owners reflect a standard that favors reasonable use consistent with evolving customs of good husbandry but enforces a limitation against selfish uses that unreasonably diminish the values and expectations of other owners.

a. Voluntary and Permissive Waste

Waste among successive-interest owners may result from either misfeasance or nonfeasance.⁷⁴ “Voluntary waste is willful waste”—that is, misfeasance.⁷⁵ American courts generally apply a good-husbandry standard to determine whether use of property constitutes voluntary waste. This standard balances the present owners’ rights of use and enjoyment, on one hand, and the future owners’ interest in the inheritance on the other. For instance, in *Jackson v. Brownson*, the court announced that a tenant would have the right to “fell part of the timber, so as to fit the land for cultivation.”⁷⁶ However, where the tenant destroyed “nearly *all* the wood on the demised premises” such that the property would be unable to sustain the needs of future interest holders to maintain its buildings, the court found the extensive clearing to be an unreasonable injury to the inheritance.⁷⁷ Similarly, the court in *Livingston v. Reynolds* enjoined a tenant’s use of timber and clay for commercial brickmaking where the purpose of the tenancy was limited to “use of the farm.”⁷⁸ Noting that use of wood and soil for brick-bote to supply the farm would be “reasonable and customary *estovers*” to which the tenant was entitled, the court held that converting the property to a commercial brickyard offended the idea of good husbandry among “even the most irregular and slovenly cultivators” and amounted to waste.⁷⁹ As these cases recognize, a tenant may

72. John A. Lovett, *Doctrines of Waste in a Landscape of Waste*, 72 MO. L. REV. 1209, 1229 (2007).

73. Merrill, *supra* note 5, at 1057; *Recent Cases – Waste – Permissive Waste – Whether Tenant for Years Liable for Treble Damages*, *supra* note 67.

74. Merrill, *supra* note 5, at 1057.

75. *Palmer v. Mossbarger*, 27 N.E.3d 944, 948 (Ohio Ct. App. 2015).

76. *Jackson v. Brownson*, 7 Johns 227, 233 (N.Y. Sup. Ct. 1810).

77. *Id.* at 234.

78. *Livingston v. Reynolds*, 26 Wend. 115, 117–18 (N.Y. 1841).

79. *Id.* at 122.

make reasonable use of natural resources consistent with the purpose of the tenancy, but their *complete* exhaustion is waste.⁸⁰

Consistent with this principal, voluntary waste restricts a tenant's use of nonrenewable resources except where the consumption of those resources is consistent with the nature of the tenancy. The common law prohibits production of coal or oil and gas by a life tenant without the consent of the remainder.⁸¹ Where, however, the grantor was extracting timber or minerals before the creation of the life estate, the open-mine doctrine permits the tenant to continue the activity alone and without liability for waste.⁸² Thus, in *Williard v. Williard*, a life tenant did not forfeit his estate by cutting timber because the court inferred from the grantor's own woodcutting that "timber was the intended source of profit" and was necessary to enjoyment of the property.⁸³ The open-mine exception, however, does not permit the tenant to exceed the level of resource use that can be inferred from the prior use of the grantor.

Where overuse may constitute waste, so can neglect. Permissive waste "arises from the neglect, omission, sufferance, or permission of the tenant"—that is, culpable nonfeasance.⁸⁴ To establish liability for most forms of permissive waste, a future interest must show that the life tenant's actions or omissions were "detrimental to the inheritance and contrary to the ordinary course of good husbandry"; if the change is one that "no good farmer would make," it is waste.⁸⁵ Here, too, custom is critical to determining the obligation of a tenant to maintain the property. In *Clemence v. Steere*, for example, the court considered both the customary "state of cultivation" in the region and the condition of the property at the start of the tenancy to determine the life tenant's duty to make repairs to "make [the property] tenantable."⁸⁶ The waste principle requires a tenant to act

80. In setting this standard, courts like *Livingston* often defer to local custom regarding reasonable use, which was generally trusted to reflect a sustainable level of resource use.

81. *See, e.g.*, *Sewell v. Sewell*, 1 N.E.2d 491, 495 (Ill. 1936).

82. *Reese v. Reese-Young*, 938 N.W.2d 405, 410 (N.D. 2020).

83. *Williard v. Williard*, 56 Pa. 119, 128 (1867).

84. *Palmer v. Mossbarger*, 27 N.E.3d 944, 948 (Ohio Ct. App. 2015) (quoting *Reams v. Henney*, 97 N.E.2d 37, 38 (Ohio Ct. App. 1950)). A classic example of permissive waste is the nonpayment of real property taxes, which saves a life tenant the amount of the tax but imposes potentially devastating losses to the future interest, who could lose title as a consequence. *See Merrill, supra* note 5, at 1057.

85. *Clemence v. Steere*, 1 R.I. 272, 274 (1850).

86. *Id.* at 275–76.

reasonably to maintain property to the extent that the value it realizes through neglect is outweighed by the utility it could preserve through diligence.

Viewed through these early cases, the waste principle permits liberal use of property while also setting an outer bound prohibiting profligate and unreasonable use.⁸⁷ Embedded in the principle is a standard of good husbandry. While not requiring any improvement and generally permitting the present owner a broad spectrum of self-governance, the waste principle demands that present uses should not diminish future utility in a way that produces net losses, whether through destruction, extraction, or neglect.

b. Ameliorative Waste and the American Rule

More complicated are situations where the present-interest owner desires to change property in a way that increases its economic value to both itself and the reversioner. In these cases, the present owner commits neither malfeasance nor nonfeasance. Nonetheless, a third doctrine of waste, ameliorative waste, may limit changes in the use of shared property that produce losses in value or in utility to future users.⁸⁸

The American doctrine of ameliorative waste can be understood through a tale of two mansions. These two cases posit waste doctrine as a flexible standard that accounts for changing circumstances, customs, and technological innovations in land use. Rather than creating a static rule that elevates one value over others—whether maximizing value or preserving property in one form—American courts have applied waste doctrine as a standard wherein multiple competing values and considerations can be balanced among owners and across past, present, and future interests.

In *Brokaw v. Fairchild*, a life tenant sought to demolish an ornate Fifth Avenue mansion in New York and convert it into an apartment building.⁸⁹ Despite acknowledging that the life tenant could make substantially more income if the property was redeveloped and that the remaindermen were “selfish and

87. Karp, *supra* note 28, at 749.

88. See Fraley, *supra* note 5, at 864–65.

89. *Brokaw v. Fairchild*, 237 N.Y.S. 6 (Sup. Ct. 1929). The life tenant demonstrated that renting the residence would not produce sufficient income to cover taxes and maintenance. *Id.* at 9–11.

unmindful” in their opposition, the court prohibited the change on grounds of waste.⁹⁰ It held that a drastic change in the property’s use constituted “an act of ownership and dominion” that contradicted the rights of use granted by the tenancy and the intent of the grantor to pass on “[his] residence.”⁹¹ Scholars of the time derided the holding as “an impediment to progress.”⁹² Yet this reductive characterization misses the *Brokaw* court’s point. Consistent with earlier English cases,⁹³ the *Brokaw* court did not find that change per se amounted to waste. Instead, it holistically considered property as existing not only in its physical location as an economic commodity but also in relationship to the grantor, the life tenant, and the reversioners. By prohibiting alterations to the mansion, the court demonstrated reverence for and allocated value to the grantor’s intention that the remaindermen receive a specific thing, “[n]ot something else of equivalent value.”⁹⁴

Where property cannot be reasonably preserved, however, waste does not require economically inefficient outcomes.⁹⁵ In another case involving an elaborate and outdated mansion, the court in *Melms v. Pabst Brewing Co.* permitted the life tenant to destroy a mansion and convert the land to a higher value industrial use.⁹⁶ Believing he owned fee simple, the life tenant destroyed a once-elegant mansion and graded the knoll where it stood to street level. Industrial buildings and railroads had encroached so closely that the property was unsuitable for a residence, while the mansion made it also useless for business purposes. The court emphasized that where land had become useless—such as a barren orchard or a grain field with no market for its crop—waste permitted a change of use and did not require the tenant to preserve the property in a useless state only to “turn it over to the reversioner, equally useless.”⁹⁷ Rather than reflecting an absolute preference for value-maximization

90. *Id.* at 14–15.

91. *Id.*

92. Merrill, *supra* note 5, at 1082–83.

93. See Fraley, *supra* note 66.

94. Merrill, *supra* note 5, at 1093.

95. See Lovett, *supra* note 72, at 1212.

96. *Melms v. Pabst Brewing Co.*, 79 N.W. 738 (Wis. 1899).

97. *Id.* at 740. The court’s decision also limited economic waste where restoration of the property to a lower-value use would require the fruitless expenditure of funds for no benefit. See Merrill, *supra* note 5, at 1075.

and industrialization,⁹⁸ however, *Melms* suggests that a tenant may change the nature of property when doing so is consistent with the principles of good husbandry that inform the doctrines of voluntary and permissive waste.

The divergent outcomes in *Brokaw* and *Melms* have been cited as marking the transformation of the law of ameliorative waste consistent with the social and realist reform of property law.⁹⁹ However, both cases can be explained more simply as permitting alterations that do not decrease the property's total utility to all its owners. Understanding ameliorative waste as either always prohibiting or permitting change based on economic values alone is incorrect. Stasis has never been the rule. While it is true that ameliorative waste has, at times, been applied to require preservation—for instance, requiring all or portions of forest to remain uncleared¹⁰⁰ or prohibiting replacement of a structure with another of greater value¹⁰¹—other examples show that the doctrine is flexible enough to permit progress. As in *Brokaw* and *Melms*, these cases show a flexible and enduring standard wherein courts consider multiple equities and values including, among others, the character and nature of the property, customs of the region, changes in technology, intent of the grantor, and purposes of the tenancy.¹⁰² Read together with other cases across a survey of waste law, ameliorative waste is not a novel doctrine nor is it a transformed one, but rather an application of the good-husbandry standard embedded within the waste principle to changing values and circumstances.

3. The Modern Governance of Waste in Divided Property

Although the prevalence of common law waste actions among owners of divided property has diminished, the principle established through waste doctrine continues to operate as a fundamental force in the governance of divided property. Legislatures have extended standing for waste to new classes of

98. See Purdy, *supra* note 5, at 692 (quoting *Pynchon v. Stearns*, 52 Mass. (11 Met.) 304, 312 (1846)).

99. Merrill, *supra* note 5, at 1080–84.

100. John G. Sprankling, *The Antiwilderness Bias in American Property Law*, 63 U. CHI. L. REV. 519, 534–36 (1996).

101. Merrill, *supra* note 5, at 1058.

102. See Fraley, *supra* note 5, at 864–65.

divided interests—concurrent owners of property¹⁰³ and mortgagees¹⁰⁴—which were not protected from waste at common law. States have also adopted statutes that incorporate aspects of the common law of waste, for example, to clarify preexisting obligations between life tenants and remaindermen¹⁰⁵ or to codify the common law distribution of mineral development rights and royalty payments among present and future interest holders.¹⁰⁶

These statutory modifications refine rather than overhaul the waste principle. Even New York's statute, often cited as abrogating *Brokaw*,¹⁰⁷ preserves the common law rule's deference for the language in the granting instrument.¹⁰⁸ While creating a presumption in favor of changes that do not reduce market value, the statute codifies the prudent-owner standard of the waste principle and requires the life tenant to provide the future owner with both notice of proposed repairs and security against costs and risk of noncompletion.¹⁰⁹ Rather than creating a *carte blanche* in favor of redevelopment, the waste principle is thus evident throughout the workings of the statute. It preserves the judicial role in evaluating the prudence of proposed changes to property and ensuring consistency with the intent of the grantor. Although statutes may modify common law rules for reasons of public policy or efficiency, they neither eliminate the common law doctrine of waste nor relegate it to obscurity. Instead, the common law rules and statutes operate together to establish the baseline rights and obligations of owners in divided property.

III. WASTE OF COMMON POOL NATURAL RESOURCES

The waste principle also molds the laws governing allocation and use of common pool natural resources. When natural resources are held in common, whether by a discrete group or the entire public, common owners tend to have co-equal rights

103. Morton Gitelman, *The Impact of the Statute of Gloucester on the Development of the American Law of Waste*, 39 ARK. L. REV. 669 (1986); Kirchwey, *supra* note 66.

104. Fraley, *supra* note 66.

105. *See, e.g.*, MONT. CODE ANN. § 70-16-103 (West 1947); OKLA. STAT. tit. 60, § 69 (1910); IDAHO CODE § 55-311 (1919); 21 GUAM CODE ANN. § 11101 (2021); TEX. PROP. CODE ANN. § 5.009 (West 1995).

106. *E.g.*, DEL. CODE ANN. tit. 25, § 303 (1995); 760 ILL. COMP. STAT. 15/10 (2019).

107. Merrill, *supra* note 5, at 1080.

108. *See* N.Y. REAL PROP. ACTS. LAW § 803(c) (McKinney 1962).

109. *See id.*

to exploit the resource on a first-come-first-served basis.¹¹⁰ Under such a rule, an owner may take from the common pool without liability to the other owners. Instead of a legal remedy, owners damaged by another commoner's capture of the resource have only the self-help remedy of capturing their own share.¹¹¹ Under a pure rule of capture, all common pool natural resources are susceptible to excessive use and premature exhaustion. Even renewable natural resources, such as rivers, are rivalrous because one commoner's use of the resource reduces its availability to other owners.¹¹² Because they can externalize the costs to the other common pool owners while internalizing all the gains, common pool owners tend to exploit the resource to exhaustion at a "socially suboptimal" rate.¹¹³

To avoid premature depletion of the common pool in this manner, extractions must be constrained by custom, contract, or law.¹¹⁴ Waste doctrine serves this function by prohibiting negative-sum transactions in the common pool. While not directly concerned with the distribution of benefits derived from a shared resource,¹¹⁵ waste sets the floor for permissible uses of a common pool asset. As among concurrent owners of divided property, waste bars actions that *monopolize* the common pool for an individual owner's sole benefit by undermining the available supply or quality of the resource or inflating the costs of its use.¹¹⁶ Resource monopolies create tremendous gain to the monopolist at

110. See Joseph A. Schremmer, *Pore Space Property*, 2021 UTAH L. REV. 1 (discussing the role of capture in oil and gas and water law).

111. *Id.*

112. *Id.*

113. See Alan E. Friedman, *The Economics of the Common Pool: Property Rights in Exhaustible Resources*, 18 UCLA L. REV. 855, 859 (1971).

114. Carol M. Rose, *Given-ness and Gift: Property and the Quest for Environmental Ethics*, 24 ENV'T L. 1, 26–28 (1994); see also ELINOR OSTROM, GOVERNING THE COMMONS 8–18 (1990) (discussing typical policy prescriptions, mostly centering on coercive legal regulation or privatization as alternatives).

115. Other legal mechanisms, such as statutory and common law provisions for correlative rights or reasonable use, may require equitable or proportional distribution of rights in the common pool. See Schremmer, *supra* note 110 (discussing the doctrines of correlative rights and reasonable use as limitations on the absolute rule of capture). The distribution of rights in public property, accordingly, is the realm of constitutional equal protection, much as the public-trust doctrine is analogous to private-tlaw waste. See Wash. State Geoduck Harvest Ass'n v. Wash. State Dep't of Nat. Res., 101 P.3d 891, 897 (Wash. 2004).

116. See Janet C. Neuman, *Beneficial Use, Waste, and Forfeiture: The Inefficient Search for Efficiency in Western Water Use*, 28 ENV'T L. 919, 964 (1998) (citing VERNON A. MUND, MONOPOLY: A HISTORY AND THEORY 100 (1933)).

the expense of diminishing the total net utility of the resource, thus violating the waste principle.

Among common pool natural resources, public waste regulation often supplants the common law doctrine. Public regulation is costlier to administer than the judicial waste doctrine and, thus, tends to arise when the resource becomes sufficiently scarce and valuable to justify the costs of adopting, implementing, monitoring, and enforcing regulation. Much as the state may exercise its police power to prevent common law nuisances,¹¹⁷ where there are many common owners and costs to enforce common law prohibitions are high, the state is justified in regulating common owners' use of the pool *ex ante* to avoid waste. Enforcing these private rights has a salutary effect on the public interest by protecting the social and economic value of the common pool resource from egregiously negative-sum uses. Where merely enforcing private rights is insufficient to satisfy the public interest, regulation may also limit private rights, subject to the requirements of due process and the Takings Clause.

The limitation on waste of common resources is derived from the physical nature of the resource, which forces owners to share.¹¹⁸ The resources examined here—oil and gas in Section III.A and water in Section III.B—are shared due to their physical nature.¹¹⁹ They are fluid, migratory, and widely geographically distributed, heedless of property boundaries, and thus subject to rivalrous, competing claims by numerous individuals,

117. Randy E. Barnett, *The Proper Scope of the Police Power*, 79 NOTRE DAME L. REV. 429, 479–87 (2004).

118. Some have bemoaned the simple fact that some resources are “owned in common because there is no alternative!” OSTROM, *supra* note 114, at 3 (quoting JOHN H. DALES, POLLUTION, PROPERTY, AND PRICES: AN ESSAY IN POLICY-MAKING AND ECONOMICS 62 (1968)).

119. Contrast this with resources that are held in common only because of a legislative policy choice, which are less susceptible to the limitation on waste inherent in the title to truly common resources. For instance, despite ecological and economic devastation resulting from overuse, courts refused to limit overgrazing on the public rangelands. Yet Congress mandated public rangelands be held in common and, despite the excludable nature of rangeland, even enjoined attempts by users to divvy up or regulate their use. See Gary Libecap, *The Assignment of Property Rights on the Western Frontier: Lessons for Contemporary Environmental and Resource Policy*, 67 J. ECON. HIST. 257, 274 (2007); John S. Harbison, *Hohfeld and Herefords: The Concept of Property and the Law of the Range*, 22 N.M. L. REV. 459, 467 (1992); George Cameron Coggins & Margaret Lindberg-Johnson, *The Law of Public Rangeland Management II: The Commons and the Taylor Grazing Act*, 13 ENV'T L. 1, 5 (1982); *Buford v. Houtz*, 133 U.S. 320, 327–28 (1890); *Healy v. Smith*, 83 P. 583, 587 (Wyo. 1906); *Lazarus v. Phelps*, 152 U.S. 81, 85 (1894).

often by virtue of owning appurtenant land.¹²⁰ As such, they are inherently nonexclusive.¹²¹ Various called true commons,¹²² “limited common property,”¹²³ or “semicommons,”¹²⁴ in these resources, “elements of private and common property both coexist and interact.”¹²⁵ The property is held in common among the particular community of users “but exclusively vis-à-vis the outside world.”¹²⁶ Across these examples,¹²⁷ common law waste law and its statutory and administrative counterparts reinforce the standard of good husbandry by limiting the ability of owners within the community to engage in self-interested behavior that diminishes the total value of the resource.

A. *Waste in Oil and Gas Law*

Oil and gas resources are a classic semicommons. They are found in interconnected underground layers of porous and permeable rocks called “reservoirs.”¹²⁸ Reservoirs often underlie numerous individually owned tracts of land, the owners of which enjoy rights in the oil and gas under the *ad coelum* doctrine.¹²⁹

120. In the case of oil and gas and groundwater reservoirs, ownership in the reservoir is determined by the *ad coelum* doctrine, which holds that ownership of land includes ownership of all underlying materials. *E.g.*, *Stillwater Water Co. v. Farmer*, 93 N.W. 907, 908 (Minn. 1903). For surface waters, rights in the water are distributed among the owners of land appurtenant to the stream (“riparian” land) or lake or shoreline (“littoral” land). *E.g.*, *Thompson v. Enz*, 154 N.W.2d 473, 482 (Mich. 1967).

121. *See* Schremmer, *supra* note 110.

122. Carol M. Rose, *Surprising Commons*, 2014 BYU L. REV. 1257, 1262 (2014).

123. Carol M. Rose, *The Several Futures of Property*, 83 MINN. L. REV. 129, 132 (1999).

124. Henry E. Smith, *Governing Water: The Semicommons of Fluid Property Rights*, 50 ARIZ. L. REV. 445, 445 (2008).

125. *Id.*

126. Rose, *supra* note 123, at 132.

127. Other examples abound, including fisheries, oceans, subterranean pore space, and even the broadcast frequency spectrum.

128. Schremmer, *supra* note 110, at 7.

129. *Id.* at 8. Jurisdictions view the nature of a landowner’s property interest in oil and gas differently. Some hold that oil and gas are corporeal real property to which the owner has fee simple title, while others regard such rights to be incorporeal akin to a profit interest. 1 PATRICK H. MARTIN & BRUCE M. KRAMER, WILLIAMS & MEYERS, OIL AND GAS LAW § 203 (Matthew Bender & Co., LexisNexis 2020). Despite this conceptual difference, both types of jurisdictions view the waste doctrine of oil and gas as impermissible. *Compare* *Elliff v. Texon Drilling Co.*, 210 S.W.2d 558 (Tex. 1948) (holding waste to be actionable under a corporeal ownership theory), *with* *McCoy v. Ark. Nat. Gas Co.*, 165 So. 632, 633 (La. 1936) (holding likewise under an incorporeal theory).

The rule of capture permits reservoir owners to produce oil or gas from their tracts, even if it drains neighboring properties.¹³⁰ Because reservoirs are interconnected, one owner's production necessarily affects the reserves and reservoir pressure available to the other reservoir owners. Reflecting this physical interconnectedness, legal rights in common reservoirs are relative, or "correlative," rather than absolute. Accordingly, the right of capture comes with reciprocal duties to other owners in the common reservoir.¹³¹ Tracking Locke's principles of "enough and as good" and "spoilage," these duties are given effect in two common law doctrines. The first is the correlative rights doctrine, which ensures that each reservoir owner has an equal opportunity to produce the reserves.¹³² The second doctrine is waste.

1. Common Law Waste of Oil and Gas

Waste doctrine is primarily concerned with not how much of the reserves an owner produces but with how the production changes the market or reservoir to the detriment of others.¹³³ Oil and gas cases wherein courts have applied the waste doctrine can be subdivided into two types: physical and economic waste. Physical waste renders oil or gas unrecoverable due to accidental destruction, intentional dissipation, or inefficient production practices.¹³⁴ Economic waste, in contrast, refers to the sale or use of oil or gas that generates insufficient economic returns.¹³⁵ A survey of oil and gas cases wherein the courts applied the waste doctrine follows.

In 1948, Texon's well in the Agua Dulce Field in Texas blew out, destroying a neighbor's well and causing significant quantities of oil and gas to blow into the air from the reservoir.¹³⁶ In the resulting case, *Elliff v. Texon Drilling Co.*, the court held

130. Schremmer, *supra* note 110.

131. *Id.*

132. *See id.*

133. *See* Commonwealth v. Trent, 77 S.W. 390 (Ky. 1903) ("To allow the storehouse of nature to be exhausted by the waste of the gas would be to deprive the state and its citizens of many advantages incident to its use.").

134. It includes both surface waste, such as venting and flaring of gas, and underground waste, such as excessive production that causes channeling and ultimate loss of producible reserves. *See* 8 PATRICK H. MARTIN & BRUCE M. KRAMER, WILLIAMS & MEYERS OIL AND GAS LAW, § W, at 1131–32.1 (Matthew Bender & Co., LexisNexis 2020).

135. *Id.*

136. *Elliff v. Texon Drilling Co.*, 210 S.W.2d 558 (Tex. 1948).

Texon liable for damages for negligent waste, despite that “substantially all of such waste or destruction occurred after the minerals had been drained from beneath” Elliff’s land.¹³⁷ It reasoned that reservoir owners have the right to appropriate gas and oil from the common reservoir, “even to the diminution or exhaustion of the supply under his neighbor’s land,” but that “the negligent waste and destruction of petitioner’s gas and distillate was neither a legitimate drainage of the minerals from beneath [Texon’s] lands nor a lawful or reasonable appropriation of them.”¹³⁸ On remand, the Court of Civil Appeals permitted Elliff to recover the value of the gas and distillate wrongfully destroyed.¹³⁹

Waste is therefore an exception to the privilege granted by the rule of capture. In blowout cases like *Elliff*, courts limit the rights of reservoir owners under the rule of capture to produce the common reservoir only for beneficial purposes. The producing owner’s accidental destruction of the reservoir imposes losses on the other common owners by reducing the quantity and quality available to them with no offsetting benefit to the producer. Because the destruction of the reservoir results in a net loss of utility to the common owners as a group, it violates the waste principle.

Similarly, almost all courts exclude from the right of capture intentional, purposeless dissipation of reserves.¹⁴⁰ While the defendants in these cases often act out of spite, it is the generation of losses without a benefit, rather than motive, that is determinative. For instance, in both *Louisville Gas Co. v. Kentucky Heating Co.*¹⁴¹ and *Higgins Oil & Fuel Co. v. Guaranty Oil Co.*,¹⁴² the defendants were clearly motivated by malice. The courts in those cases, however, enjoined the activities not due to malice but

137. *Id.* at 560.

138. *Id.*

139. *Texon Drilling Co. v. Elliff*, 216 S.W. 2d 824, 829 (Tex. App. 1948).

140. MARTIN & KRAMER, *supra* note 129, § 204. In one oft-cited exception, *Hague v. Wheeler*, the court permitted the defendant’s intentional dissipation when, lacking access to market, the defendant flared gas from its well to leverage plaintiffs to share their market or pay an exorbitant price to shut in. *Hague v. Wheeler*, 27 A. 714 (Pa. 1893). Although *Hague* has been characterized as permitting waste, it was actually resolved on the basis of the plaintiffs’ inequitable conduct in inducing the defendant to drill without a market, as demonstrated persuasively by David E. Pierce, *Carol Rose Comes to the Oilpatch: Modern Property Analysis Applied to Modern Reservoir Problems*, 19 PENN STATE ENV’T L. REV. 241, 258–59 (2011).

141. *Louisville Gas Co. v. Ky. Heating Co.*, 77 S.W. 368, 369 (Ky. 1903) (noting that the defendant sought to “cripple [plaintiff] as a rival”).

142. *Higgins Oil & Fuel Co. v. Guar. Oil Co.*, 82 So. 206, 211–12 (La. 1919).

rather because the plaintiffs could show no offsetting benefits to justify damage to the reservoirs. The *Louisville* court explained that “a man is only allowed to make a reasonable use of those natural supplies which are for the common benefit of all.”¹⁴³ In contrast, in *Kelley v. Ohio Oil Co.*, the court declined to hold the defendant liable, despite finding that the defendant maliciously drilled wells along the plaintiff’s property line to drain the plaintiff’s reserves.¹⁴⁴ Although the plaintiffs in each case suffered the same kind of harm, the distinguishing fact is that the defendant in *Kelley* did not squander its production. Taken together, the accidental destruction and intentional dissipation cases demonstrate an essential requirement of waste in the context of common pool resources: production from a common source must be for a beneficial purpose.

Waste also dictates that production must generate enough benefit to the producer to outweigh the losses it imposes on other reservoir owners. As such, the doctrine proscribes production practices that are extremely inefficient because they reduce ultimate recovery from the reservoir.¹⁴⁵ For instance, in *Manufacturers’ Gas & Oil Co. v. Indiana Natural Gas & Oil Co.*, the court enjoined a defendant from using artificial pumps to produce its wells based on the plaintiff’s assertion that the practice would cause salt water to encroach prematurely and strand producible gas. The court recognized a common law right to enjoin “any and all acts of another owner which will materially injure, or which will involve the destruction of the property in the common fund or supply of gas.”¹⁴⁶ The key factor in *Manufacturers’ Gas* was not the technology employed by the defendant but rather its suitability to the particular reservoir.¹⁴⁷ The loss of reserves available to the plaintiff and other reservoir owners outweighed the marginal production increase the defendant achieved from using artificial pumps.

143. *Louisville Gas Co.*, 77 S.W. at 369 (internal citations omitted).

144. *Kelley v. Ohio Oil Co.*, 49 N.E. 399, 401 (Ohio 1897).

145. In contrast, efficient production practices by definition maximize the value of reserves that are ultimately recovered.

146. *Mfrs.’ Gas & Oil Co. v. Ind. Nat. Gas & Oil Co.*, 57 N.E. 912, 917 (Ind. 1900).

147. To determine whether production techniques are wasteful, courts frequently defer to local custom which, in turn, reliably reflects the physical characteristics of the reservoir. *See, e.g.*, *Jones v. Forest Oil Co.*, 44 A. 1074, 1076 (Pa. 1900); *Peterson v. Grayce Oil Co.*, 37 S.W.2d 367, 372–73 (Tex. Civ. App. 1931).

The *sine qua non* of liability for physical waste is the fact that the practice diminishes the total recoverable reserves otherwise available to the commoners without any offsetting benefit. It leaves the owners as a group marginally worse off relative to the ordinary or customary manner of production employed in the reservoir or reservoirs of similar type. Waste, then, provides owners with a mechanism to hold other commoners accountable when transactions in the common pool diminish its total net value to all its owners.¹⁴⁸

Though quick to remedy physical waste of a common reservoir, courts have hesitated to correct cases of alleged economic waste or to compel owners in a common pool to maximize the economic value of production. In two cases, *Sneed v. Phillips Petroleum Co.*¹⁴⁹ and *Corzelius v. Harrell*,¹⁵⁰ the plaintiffs sought to require other owners to adopt production techniques that would maximize the ultimate economic value of production removed from the pool—by prohibiting stripping of gas in *Sneed* and requiring extraction of liquids in *Corzelius*. In both cases, the court refused, even though those techniques could have increased both the value of the reservoir as a whole and the defendant's portion. Waste doctrine does not mandate the optimal use of resources from a common pool. Consistent with this formulation of waste as an outer boundary on the use of property, in the absence of inefficient production methods or fruitless practices that diminish the reservoir itself, courts are hesitant to supplement their own value-maximizing decisions about the best use of production for that of the reservoir owners or administrative agencies.¹⁵¹

2. Statutory Waste Regulation of Oil and Gas

The judicial doctrine of waste is often of limited help to reservoir owners suffering because of another owner's wasteful conduct. Oil and gas reservoirs typically have hundreds of individual owners, each with a relatively small fractional interest in the total corpus. It generally makes little economic sense for

148. Remedies may include both an injunction to prevent ongoing waste and damages to compensate for past losses.

149. *Sneed v. Phillips Petroleum Co.*, 76 F.2d 785 (5th Cir. 1935).

150. *Corzelius v. Harrell*, 179 S.W.2d 419, 422 (Tex. Civ. App. 1944).

151. *Id.* (“The issue of waste due to method of extraction of liquids after the gas was taken from the reservoir was one in which the Commission alone, as representative of the public, had an interest.”).

individual owners to incur all the costs of litigating to remedy waste when they will enjoy only a fraction of the benefits of a remedy.¹⁵² Further, waste doctrine alone is insufficient to protect the public and private interests. As illustrated in economic waste cases like *Sneed* and *Corzelius*, the judicial process is limited in its ability to maximize efficiency and overall value. Further, judicial remedies are generally retrospective and thus do not prevent waste from happening in the first place—a major limitation because the effects of waste are often permanent.¹⁵³ Consequently, statutory and regulatory mechanisms improve upon the common law doctrine by overcoming coordination problems and imposing clear ex ante rules.

Perhaps unsurprisingly, given these limitations, the first seventy-five years or so of oil and gas production in the United States were marked by rampant waste.¹⁵⁴ By the early twentieth century, states began to respond by adopting piecemeal waste-prohibiting legislation.¹⁵⁵ Beginning with the Supreme Court in *Ohio Oil Co. v. Indiana*,¹⁵⁶ courts consistently upheld these basic waste-prevention statutes against constitutional attacks under due process and the Takings Clause as a permissible exercise of the police power to enforce reservoir owners' private rights to be free from waste.¹⁵⁷ Courts found that these waste-prevention statutes simply gave effect to the common law prohibitions and, as such, were fully constitutional. Following the formation of the Interstate Oil and Gas Compact Commission (IOGCC) in 1935 and its development of the Model Oil and Gas

152. Coordinating collective action among reservoir owners is difficult because of their large numbers, accompanying transaction costs, and holdout problems.

153. See, e.g., *Elliff v. Texon Drilling Co.*, 210 S.W.2d 558 (Tex. 1948) (involving the total destruction of a common reservoir of condensate from the defendant's wasteful negligence).

154. The rule of capture incentivized the drilling of too many wells, which were produced at too great a rate, resulting in excessive capital investment, premature dissipation of reservoir energy, and surpluses of production that overwhelmed transportation facilities and market demands. See Schremmer, *supra* note 110; Owen L. Anderson, *The Evolution of Oil and Gas Conservation Law and the Rise of Unconventional Hydrocarbon Production*, 68 ARK. L. REV. 231, 232–36 (2015).

155. Examples included an Indiana statute prohibiting venting of natural gas from a common pool that served the lighting and heating needs of nearby municipalities and a California statute imposing gas-to-oil ratio requirements to prevent the waste of natural gas. See *Ohio Oil Co. v. Indiana*, 177 U.S. 190 (1900); *Bandini Petroleum Co. v. Super. Ct.*, 284 U.S. 8 (1931).

156. *Ohio Oil Co.*, 177 U.S. at 210.

157. E.g., *Champlin Refining Co. v. Corp. Comm'n of Okla.*, 286 U.S. 210 (1932); *Bandini*, 284 U.S. at 8; *Lindsley v. Nat. Carbonic Gas Co.*, 220 U.S. 61 (1911).

Conservation Statute, all oil-and-gas-producing states adopted comprehensive oil and gas conservation statutes prohibiting waste.¹⁵⁸ These statutes codify the judicial waste doctrine in specific and detailed terms¹⁵⁹ and enforce it through a number of regulatory mechanisms, including well-construction and spacing requirements and compulsory pooling and unitization.¹⁶⁰

Statutes passed after 1935 also authorized regulation of certain forms of economic waste. States imposed quotas limiting production to no more than necessary to meet reasonable market demand, often in the form of prorationing and allowables.¹⁶¹ Production in violation of such regulations is not protected by the rule of capture and, therefore, entitles reservoir owners who suffer drainage to seek damages for conversion.¹⁶² Statutes also prohibited economic waste resulting from inefficient utilization of gas.¹⁶³ In upholding legislation prescribing economic waste in *Henderson Co. v. Thompson*,¹⁶⁴ the Supreme Court confirmed that legislatures' power to regulate production is not limited to merely protecting against physical waste and adjusting private correlative rights, but extends to limiting such private rights to serve the public interest.¹⁶⁵ *Henderson* affirmed that

158. Anderson, *supra* note 154.

159. *E.g.*, MODEL OIL AND GAS CONSERVATION ACT § 2(24) (INTERSTATE OIL & GAS COMPACT COMM'N 2004); N.M. STAT. ANN. § 70-2-3 (West 1978); WYO. STAT. ANN. § 30-5-101(a)(i) (West 1977).

160. *See generally* David E. Pierce, *Coordinated Reservoir Development—An Alternative to the Rule of Capture for Development of Oil and Gas*, 4 J. ENERGY L. & POL'Y 1, 62 (1983) (discussing the basic tools of conservation law).

161. Anderson, *supra* note 151, at 241–42; James Coleman, *State Energy Cartels*, 42 CARDOZO L. REV. 2233, http://cardozolawreview.com/wp-content/uploads/2022/01/Website-3_COLEMAN.42.6.8.DONE-.pdf [<https://perma.cc/72ZM-X5H5>] (discussing the cartelization of state industries to influence prices).

162. *Wronski v. Sun Oil Co.*, 279 N.W.2d 564, 571 (Mich. Ct. App. 1979); *Loefler v. King*, 228 S.W.2d 201, 214 (Tex. Civ. App. 1950).

163. The usefulness of gas for municipal light and heating had become obvious, yet many gas fields were located far from existing settlements, and pipeline transportation capacity was limited. Rather than transport gas to municipalities, many producers sold their gas for gasoline stripping and carbon black manufacturing, which consumed enormous amounts of gas while making little use of its heating value. Concerned that the manufacturing process squandered natural gas capable of one day supporting new and growing population centers, states adopted laws declaring use of natural gas in carbon black manufacture to be waste. Natural gas producers challenged these statutes as uncompensated takings and violations of their due process rights. *See Thompson v. Consol. Gas Utils. Corp.*, 300 U.S. 55, 59–62 (1937); *Walls v. Midland Carbon*, 254 U.S. 300 (1930).

164. *Henderson Co. v. Thompson*, 300 U.S. 258 (1937).

165. Pierce, *supra* note 160, at 61–62; *Cities Serv. Gas Co. v. Peerless Oil & Gas Co.*, 340 U.S. 179, 185–86 (1950) (internal citations omitted) (“This Court has upheld numerous kinds of state legislation designed to curb waste of natural

legislatures, acting for public purposes rather than exclusively to limit private harms, have greater ability to regulate forms of economic waste than do courts.¹⁶⁶

In recent decades, growing concerns over the environmental and social costs of oil and gas development have led states to reform their conservation laws to prioritize protection of public health and the environment above prevention of waste.¹⁶⁷ As early as 1979, the Michigan Supreme Court construed that state's statutory waste prohibition to proscribe "any spoilation or destruction of the land, including flora and fauna" and to prevent serious environmental damages from production.¹⁶⁸ Most recently, with the 2019 passage of Senate Bill 19-181, Colorado amended its Oil and Gas Conservation Act to specify that waste "[d]oes not include the nonproduction of oil [or gas] from a formation if necessary to protect public health, safety, and welfare, the environment, or wildlife resources as determined by the commission."¹⁶⁹ Thus, much like instream flow protections introduced in water law,¹⁷⁰ SB 19-181 empowers the state's conservation commission to require that some oil and gas be left in place to protect the environment, wildlife, and public health. The statute functionally expands the meaning of "utility" under the waste principle to include environmental and human health considerations, as well as economic value, and expands the group of relevant interests to include the public. As such, Colorado's rule serves as a social-benefit version of the waste principle, which holds that where the marginal cost to society exceeds the benefits of production, loss of production is not waste. This change marks a departure from established judicial and statutory definitions of waste to align more closely with the social concept, which increasingly views the environmental and aesthetic degradation caused by oil and gas production and use as wasteful.¹⁷¹

resources and to protect the correlative rights of owners through ratable taking, or to protect the economy of the state. These ends have been held to justify control over production even though the uses to which property may profitably be put are restricted.").

166. Pierce, *supra* note 160, at 58–62; *Henderson Co.*, 300 U.S. at 264.

167. See Tara K. Righetti, *The Incidental Environmental Agency*, 2020 UTAH L. REV. 685 (2020).

168. *Mich. Oil Co. v. Nat. Res. Comm'n*, 276 N.W.2d 141, 147 (Mich. 1979).

169. COLO. REV. STAT. § 34-60-103(b) (2019).

170. See *infra* notes 225–239 and accompanying text.

171. See generally Monika U. Ehrman, *A Call for Energy Realism: When Immanuel Kant Met the Keep It in the Ground Movement*, 2019 UTAH L. REV. 435

B. Waste in Water Law

Like oil and gas reservoirs, water resources (e.g., lakes, rivers, and aquifers) are generally owned in common by multiple parties each holding a nonexcludable claim to use the water.¹⁷² Unlike oil and gas, there is great variability among types of water resources, including surface resources and groundwater resources, both of which may be stock (depletable) or flow (renewable) types depending on whether depletion exceeds the rate of recharge.¹⁷³ To accommodate the variety and differing climate conditions, eastern and western states developed distinct systems to allocate rights to use surface resources: prior appropriation in the West and riparianism in the East. In groundwater aquifers, the common law adopted the rule of capture,¹⁷⁴ although most jurisdictions today have adopted alternatives.¹⁷⁵ The prohibition against waste is baked into each of these doctrines.¹⁷⁶

Many western American states follow prior-appropriation doctrine for both groundwater and surface waters.¹⁷⁷ Originating as a custom among miners in 1800s California,¹⁷⁸ the

(2019) (illustrating that concerns over wastewater disposal and climate change were catalysts for the Keep It in the Ground Movement); Tara K. Righetti et al., *The New Oil and Gas Governance*, 130 YALE L.J.F. 51 (2020) (describing how state legislatures have reshaped oil and gas law to better address environmental impacts).

172. ANTHONY DAN TARLOCK, LAW OF WATER RIGHTS AND RESOURCES § 3:10 (2021).

173. *Id.*

174. *Acton v. Blundell* (1843) 152 Eng. Rep. 1223 (UK); *Frazier v. Brown*, 12 Ohio St. 294 (1861), *overruled by* *Cline v. Am. Aggregates Corp.*, 474 N.E.2d 324, 327 (Ohio 1984), *overruled in part by* *McNamara v. City of Rittman*, 838 N.E.2d 640, 644 (Ohio 2005).

175. These include the correlative rights doctrine, a rule of reasonable use similar to riparian law (the “American Rule”), RESTATEMENT (SECOND) OF TORTS § 858A (AM. L. INST. 1979), or the prior-appropriation doctrine. Schremmer, *supra* note 110; Joseph W. Dellapenna, *A Primer on Groundwater Law*, 49 IDAHO L. REV. 265, 274–75 (2013).

176. *See infra* Section III.B.1.

177. Four prolific groundwater-producing states in the West do not follow prior appropriation for groundwater. Arizona and Nebraska follow a regulated riparian system, Texas applies the rule of capture, and California follows a form of correlative rights. *See* Dellapenna, *supra* note 175, at 276–80, 308 n.342.

178. Reed D. Benson, *A Few Ironies of Western Water Law*, 6 WYO. L. REV. 331, 333 (2006).

doctrine was later adopted by western courts and legislatures.¹⁷⁹ Under prior appropriation, groundwater and surface waters are generally dedicated by statute or constitution to public ownership and state administration. Private parties may obtain rights to appropriate state waters, without proving ownership to appurtenant land, by diverting water for a “beneficial use” in accordance with applicable statutes and regulations. Appropriative rights, therefore, never include the right to waste water,¹⁸⁰ to divert water purely for speculation, or to monopolize it.¹⁸¹ Appropriation of water must be in a quantity that is non-wasteful.¹⁸² Thus, the appropriative right is coextensive with the beneficial use in both quantity and duration.¹⁸³

Riparian law is the primary water law system in the eastern United States, where water is comparatively plentiful and water uses tend to be less intense and consumptive than in the West.¹⁸⁴ Courts applying riparian law rarely utter the word “waste,” but the waste principle nonetheless underpins the system. Under riparianism, owners of land abutting surface waters have the right to “reasonable use” of the water, even if it diminishes the flow of a stream or level of a lake available to other owners.¹⁸⁵ Riparian rights are usufructuary, which “includes the right to use and enjoy the property but not the right to waste or convey the property.”¹⁸⁶ Thus, much as waste cannot form the basis for a water right under prior appropriation, no riparian owner has the right to waste water from the common source of supply.¹⁸⁷

Though quite different from each other, each of these systems includes doctrinal and statutory waste prohibitions that

179. Burke W. Griggs, *Beyond Drought: Water Rights in the Age of Permanent Depletion*, 62 U. KAN. L. REV. 1263, 1271–72 (2014); see *Lux v. Haggin*, 10 P. 674 (Cal. 1886); *Coffin v. Left Hand Ditch Co.*, 6 Colo. 443 (1882).

180. See *Shupe*, *supra* note 8, at 495 (first citing *Power v. Switzer*, 55 P. 32 (Mont. 1898); and then citing *Hough v. Porter*, 95 P. 732, *modified*, 98 P. 1083 (Or. 1908), *aff'd on rehearing*, 102 P. 728 (Or. 1909)).

181. 1 SAMUEL WEIL, *WATER RIGHTS IN THE WESTERN STATES* 407 (3d ed. 1911); Neuman, *supra* note 116, at 962–63.

182. Frank J. Trelease, *The Concept of Reasonable Beneficial Use in the Law of Surface Streams*, 12 WYO. L.J. 1, 16 (1957); Neuman, *supra* note 116, at 926.

183. TARLOCK, *supra* note 172, § 5:68.

184. Carol M. Rose, *Energy and Efficiency in the Realignment of Common-Law Water Rights*, 19 J. LEGAL STUD. 261, 290–92 (1990).

185. *Thompson v. Enz*, 154 N.W.2d 473, 482 (Mich. 1967); *Heise v. Schulz*, 204 P.2d 706, 713 (Kan. 1949).

186. 1 WATERS AND WATER RIGHTS § 7.04 (Amy K. Kelly ed., 3d ed. 2021).

187. *Schulz*, 204 P.2d at 712–13.

limit the quantities of and purposes for which water may be used. The waste principle is subsumed within rules of reasonable use in groundwater and riparian systems and beneficial use in prior-appropriation systems. As in oil and gas law, these systems only legitimize uses of water that do not result in negative-sum transactions in the common source. These doctrines prohibit inefficient and excessive uses that diminish the total net utility of the resource or exclude others from access altogether. Moreover, as in the oil and gas cases, courts in each of the water law systems sparingly enforce these principles by injunction.¹⁸⁸

As will be clear in the following discussion, the waste principle tends to require a higher degree of efficiency in the appropriation and use of water than it requires in oil and gas law. This reflects an important difference between oil and gas and water. While oil and gas resources are tremendously valuable and important to society, they lack the public importance of water, which is needed to sustain life itself. For instance, water is typically dedicated to ownership by the public, whereas oil and gas are not. The waste principle responds to water's unique public importance by imposing somewhat more exacting standards than are seen in oil and gas law.

The waste principle inherently limits rights in water through its requirements that water must be used beneficially or reasonably, efficiently, and in a manner that does not monopolize the resource or diminish the fair rights of access and use by others. As the next two Subsections demonstrate, these tenets against waste have been customized within various common law water systems and incorporated in contemporary statutes without departing significantly from the waste principle.

1. Common Law of Water Waste

Water appropriation systems limit withdrawals from the common pool based on use. The quantity of water available to a specific user is determined neither as a set proportion to the pool nor based on the motive of the user,¹⁸⁹ but rather by the extent

188. *E.g.*, *Stillwater Water Co. v. Farmer*, 93 N.W. 907, 910 (Minn. 1903) (applying the rule of capture); *Campbell v. Grimes*, 64 P. 62, 62 (Kan. 1901) (applying riparianism); *Madson v. Spokane Valley Land & Water Co.*, 82 P. 718, 718 (Wash. 1905) (applying prior-appropriation doctrine).

189. Consider *Stillwater Water Co. v. Farmer*, where the plaintiff alleged the defendant dug a ditch on his property for the sole purpose of diverting water from under plaintiff's property "to the annihilation of plaintiff's business." Employing

to which the user can efficiently put water to beneficial use. This principle is reflected in the useful-purpose requirement within the rule of capture for groundwater,¹⁹⁰ the beneficial-use requirement in the doctrine of prior appropriation,¹⁹¹ and the reasonable-use rule of riparianism. At their core, the primary purpose of these doctrines is to avoid waste of water¹⁹² by assuring that both the quantity and purpose of the appropriation are non-wasteful.¹⁹³

Traditionally, courts considered a use to be beneficial or reasonable if it generated a net gain in economic value compared with nonuse of the water. Perhaps the broadest of the surface-appropriation doctrines, riparianism allows “almost any application of water that fulfills a need or desire of man [to] be considered a proper use.”¹⁹⁴ Similarly, most rule-of-capture courts prohibited waste by limiting the right to drain water from under neighboring parcels to situations where the water was put to a “useful purpose.”¹⁹⁵ Standard beneficial uses in appropriation states included domestic uses, municipal uses, irrigation, stock watering, mining, and water power,¹⁹⁶ representing a preference for uses that supported economic growth and development. Although flexible enough to expand in response to “changes in society’s recognition of the value of new uses of our resources,”

reasoning identical to oil and gas cases like *Louisville Gas*, the court held that the privilege afforded under the rule of capture to damage other common owners by drainage is contingent on the supply being used to generate some benefit. See *Stillwater Water Co.*, 93 N.W. at 908; Nadav Shoked, *Two Hundred Years of Spite*, 110 N.W. L. REV. 357, 377–82 (2004) (demonstrating that courts do not consider the actor’s intent but only the social value of the water’s uses).

190. See *Cantwell v. Zinser*, 208 S.W.2d 577, 579 (Tex. Civ. App. 1948); *Sloss-Sheffield Steel & Iron Co. v. Wilkes*, 165 So. 764 (Ala. 1936); *Patrick v. Smith*, 134 P. 1076, 1079 (Wash. 1913). Today, the only American jurisdiction still following the rule of capture is Texas.

191. The “beneficial use” requirement has been codified in the prior-appropriation statutes and constitutions of most western states. See Neuman, *supra* note 116.

192. TARLOCK, *supra* note 172, § 5:70 (first citing *A-B Cattle Co. v. United States*, 589 P.2d 57 (Colo. 1978), and then citing *Union Mill & Mining Co. v. Dangberg*, 81 F. 73 (Cir. Ct. Nev. 1897)).

193. Neuman, *supra* note 116, at 926 (noting that all that is required is that the use be “socially acceptable”).

194. Trelease, *supra* note 182, at 6. In this context, the reasonable-use doctrine may be broader than beneficial use under prior-appropriation law. For instance, courts have traditionally considered recreation to be reasonable and have limited later appropriations that would lower water levels and impair established recreational uses. *In re Martha Lake*, 277 P. 382, 382 (Wash. 1929).

195. See *Tampa Waterworks Co. v. Cline*, 20 So. 780, 784 (Fla. 1896).

196. TARLOCK, *supra* note 172, § 5:68.

the doctrines fundamentally reflect an economic view of water resources that favors use.¹⁹⁷ Consequently, under both systems, leaving water resources unused could constitute waste unless the ultimate purpose was somehow commercial.¹⁹⁸

Yet the waste principle within these doctrines requires that the waste not only produce gains, but also that it does not produce negative-sum losses. This requires that appropriations for new purposes are, at least theoretically, beneficial considering contemporary technology and water scarcity.¹⁹⁹ As the amount of unappropriated water has dwindled in western states, courts in appropriation-doctrine states have interpreted beneficial use to require greater efficiency in use of water.²⁰⁰ Echoing this same principle, courts in the riparian and common law groundwater systems have restricted use or transfers of water outside of the basin where it was drawn.²⁰¹ Though subsequent developments have blurred the distinction between inter- and intra-basin uses, these place-of-use limitations incorporated the

197. *Dekay v. U.S. Fish & Wildlife Serv.*, 524 N.W.2d 855, 858 (S.D. 1994) (quoting Rick A. Thompson, *Statutory Recognition of Instream Flow Preservation: A Proposed Solution for Wyoming*, 17 LAND & WATER L. REV. 139, 143 (1982)).

198. *In re Metro. Util. Dist. of Omaha*, 140 N.W.2d 626, 637 (Neb. 1966); *Empire Water & Power Co. v. Cascade Town Co.*, 205 F. 123, 128–29 (8th Cir. 1913); *Campbell v. Grimes*, 64 P. 62, 62 (Kan. 1901) (enjoining an upper riparian proprietor from permitting water to run to waste over a sand bar onto non-productive land). Today, nonuse—leaving water in its channel—is permitted as nonwasteful by statute in many jurisdictions.

199. Shupe, *supra* note 8, at 498 (citing *Tudor v. Jaca*, 164 P.2d 680 (Or. 1945)).

200. *Broughton v. Stricklin*, 28 P.2d 219, 279 (Or. 1933); Trelease, *supra* note 182, at 16.

201. For instance, many courts permitted beneficial uses of groundwater “in connection with the land,” while finding that sales of groundwater outside the basin violate the rights of others in the common pool. *Compare Wiggins v. Brazil Coal & Clay Corp.*, 452 N.E.2d 958, 961–64 (Ind. 1983), and *Smith v. City of Brooklyn*, 46 N.Y.S. 141 (App. Div. 1897), and *Right to Conduct and Use Artesian Water out of Artesian Basin*, 31 A.L.R. 906 (1924), with *City of Corpus Christi v. City of Pleasanton*, 276 S.W.2d 798, 801–02 (Tex. 1955) (citing 56 AM. JUR., § 118, at 601 (1995)) (“There certainly was no limitation that prohibited the use of the water off of the premises where it was captured. Neither was there any restriction of its use to a particular area. Under the so-called ‘common-law’ or ‘English’ rule, which prevails in some jurisdictions, the right to extract artesian water for use outside the basin or district in which it is found would seem to be unrestricted.”). Similarly, traditional riparianism required that water be used to benefit only riparian lands and inter-basin transfers and uses of water to benefit non-riparian lands were held to be unreasonable use. *See Transfer of Riparian Right to Use Water to Nonriparian Land*, 14 A.L.R. 330 (originally published in 1921); 1 WATERS AND WATER RIGHTS § 7.03 (Amy K. Kelly ed., 3d ed. 2021). Some courts permit appropriations to benefit non-riparian land, but only if they do not interfere with the use that any riparian owner was making of the water. *E.g.*, *Brown v. Chase*, 217 P. 23, 26–27 (Wash. 1923).

principle that economic and beneficial uses of collectively owned resources should inure to the same community of owners from which they are withdrawn.²⁰²

Both riparian and prior-appropriation systems impose minimum-efficiency standards on the quantity of water appropriated for beneficial or reasonable use. Use of water may be enjoined, not because the use is inherently valueless but because it involves an exceedingly inefficient quantity of water relative to the value of the use or the lost value of water available to other users.²⁰³ Applying this reasoning in a small number of prior-appropriation cases, courts have prohibited appropriations for uses they found inefficient: forming ice over fields to preserve soil moisture,²⁰⁴ soaking a field to make it easier to plow,²⁰⁵ flooding fields to exterminate rodents,²⁰⁶ and transporting sand and gravel for mining.²⁰⁷ Riparian courts similarly require that the riparian's use of water be minimally efficient to achieve its beneficial purpose.²⁰⁸ For example, in *Peabody v. City of Vallejo*, the court held that a riparian was not entitled to demand the full flow of the stream merely because some slight benefits resulted when he used the overflow to deposit silt on his lands, wash salt from his marshes, or replenish groundwater.²⁰⁹ As *Peabody* noted, what constitutes waste of water depends on "the circumstances of each case," and necessarily changes as circumstances

202. In this way, these limitations mirror the holding of *Jackson v. Brownson*, which permitted the cutting of timber for brick-bote used on the premises but prohibited off-lease sales. See *supra* text accompanying notes 76–77.

203. See TARLOCK, *supra* note 172, § 5:71. For example, in one case, the Oregon Supreme Court reduced the amount of water a power company could use to dispose of ice and debris at its dam during irrigation season because permitting the use would "be equal to depriving about 1,600 acres of land of water for irrigation." *In re Water Rights of Deschutes River and Tributaries*, 286 P. 563, 577–78 (Or. 1930).

204. *Blain Cnty. Inv. Co. v. Mays*, 291 P. 1055, 1057 (Idaho 1930).

205. *Heunings v. Water Res. Dept.*, 622 P.2d 333, 335 (Or. 1981).

206. *Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist.*, 45 P.2d 972, 1007 (Cal. 1935). *Contra* *Herminghaus v. S. Cal. Edison Co.*, 252 P. 607, 617 (Cal. 1926) (finding that plaintiff's use of the overflow of a river for irrigation was economically wasteful but nonetheless holding that power company was not entitled to dam up the river). *Herminghaus* was so repellent to the California legislature that it amended the constitution two years later. See *Gin S. Chow v. City of Santa Barbara*, 22 P.2d 5, 15 (Cal. 1933).

207. *Joslin v. Matin Mun. Water Dist.*, 429 P.2d 889 (Cal. 1967).

208. 1 WATERS AND WATER RIGHTS § 9.03 (Amy K. Kelly ed., 3d ed. 2021) (citing RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* § 1.2 (5th ed. 1998)); RESTATEMENT (SECOND) OF TORTS § 850A cmt. *i* (Am. L. Inst. 1979).

209. *Peabody v. City of Vallejo*, 2 Cal. 2d 351, 369 (1935).

change.²¹⁰ As demands on a water resource increase or the resource becomes less plentiful, the minimum-efficiency requirement of waste law ratchets up.²¹¹

Courts also prohibit means of diversion that are so egregiously inefficient as to be wasteful. Take *Shodde v. Twin Falls Land & Water Co.*,²¹² where the Supreme Court declined to limit other appropriators from using the flow of the Snake River to protect the plaintiff's particular means of diversion, namely antiquated water wheels that required nearly the entire flow of the river to operate. The Court would not recognize a vested right to a means of diversion that was so inefficient as "to deprive a whole neighborhood or community of its use and vest an absolute monopoly in a single individual."²¹³ Waste does not, however, require that diversions be maximally efficient. Particularly when water is abundant, courts permit some loss of water related to the manner of diversion. By referencing local custom as the baseline for minimum-acceptable efficiency, courts permit appropriators under beneficial-use doctrine to divert enough water to accommodate both the underlying beneficial purpose and any customary losses of water related to the means of diversion.²¹⁴ As waters became fully appropriated, however, courts began to require greater efficiency in diversions and conveyances than was customary to allow others to share in the limited supply.²¹⁵

Judicial efficiency requirements in water systems give effect to the waste principle's bar against negative-sum transitions and monopolies. Just as courts limit wasteful means of

210. *Id.* at 367; *see also Tulare Irrigation Dist.*, 45 P.2d at 1007 ("What is a beneficial use at one time may, because of changed conditions, become a waste of water at a later time.").

211. RESTATEMENT (SECOND) OF TORTS § 850A (Am. L. Inst. 1979).

212. *Shodde v. Twin Falls Land & Water Co.*, 224 U.S. 107 (1912). The authoritative discussion of *Shodde* and the evolving nature of the reasonable beneficial-use requirement is Tarlock, *supra* note 8.

213. *Shodde*, 224 U.S. at 121; *see also Empire Water & Power Co. v. Cascade Town Co.*, 205 F. 123 (8th Cir. 1913) (denying appropriative right to the entire flow of a waterfall to support resort).

214. Shupe, *supra* note 8, at 491.

215. Such was the case in *Doherty v. Pratt*, which held that the senior appropriator could no longer divert his portion of the water into a natural creek bed where two-thirds of it was lost to seepage and evaporation. *Doherty v. Pratt*, 124 P. 574, 576–77 (Nev. 1912); *accord Erickson v. Queen Valley Ranch Co.*, 99 Cal. Rptr. 446, 450 (Ct. App. 1971) (holding there is no privilege to maintain an inefficient conveyance when another appropriator "may be willing to invest in a more efficient conveyance system in order to capture and use the water now lost en route").

production in oil and gas, courts applying water law doctrines prevent marginal losses to the common pool resource by limiting efficiency losses in the manner of diversion. Compare *Shodde* with *Manufacturers' Gas*. In both cases, an appropriator was denied the right to use a means of diversion that was so inefficient that it practically monopolized the resource by denying other appropriators a fair opportunity to use it. Although courts in water law cases have been more willing to actively police production methods for minimum efficiency, in both instances, courts limit appropriations only in the most extreme cases²¹⁶—that is, where the collective losses of resource access suffered by the other common owners substantially exceed any modest gains enjoyed by the appropriator.

Prior appropriation and riparianism also expressly limit resource monopolies through limits on the right to store water or to block access to water resources. Prior appropriation excludes appropriations for the sole purpose of storing water for speculation or monopoly. In *Weaver v. Eureka Lake Co.*,²¹⁷ the court invalidated the defendant's claim of a prior-appropriation right to dam water to ensure a sufficient supply of water for its diversion during summer months.²¹⁸ The court explained that the defendant's claim was invalid because "[t]he water was not claimed for any useful or beneficial purpose," but instead "for no other object . . . than that of speculation."²¹⁹ Likewise, riparianism's reasonable use rule does not include storing water without putting it to a productive purpose.²²⁰ In this way, the beneficial and reasonable use requirements prevent monopolizing uses which diminish the net total utility of the resource and violate the waste principle.

Courts in both systems also further the anti-monopoly policy by prohibiting one rights holder from blocking others' access to common supply. In *Kurrie v. Walker*, a riparian case, a littoral owner was liable to other owners for constructing a water fence

213. See Shupe, *supra* note 8 ("Inefficient customary practices of appropriators have been limited in only a few cases, where the percentage of water lost was extreme and local waters were in short supply.").

217. *Weaver v. Eureka Lake Co.*, 15 Cal. 271 (1860).

218. *Id.* at 273–74.

219. *Id.* at 275.

220. *Sturtevant v. Ford*, 182 N.E. 560, 565 (Mass. 1932). In holding that damming up a common stream to create a storage reservoir was unreasonable, the court in *Sturtevant* explained that riparian law grants "no right of property in such water in the sense that it can be the subject of exclusive appropriation and dominion." *Id.* at 561.

that effectively blocked the plaintiffs' co-equal rights to access the lake for swimming, boating, and fishing.²²¹ Similarly, in *Madson v. Spokane Valley Land & Water Co.*, a prior-appropriation case, a littoral owner was liable for constructing a dam in a lake for irrigation because it completely blocked other owners' lake access.²²² The collective losses of access generally outweighed the gains internalized by the monopolist, leaving the owners as a group worse off than if the monopolist had not constructed the improvement.

In sum, the provisions of water law doctrines preclude waste in multiple ways. Reasonable and beneficial-use provisions prohibit waste by requiring that any take from the common source be put to a use that produces at least some benefit to offset the concurrent losses to the other common pool owners. These provisions also require a minimum level of efficiency in how the water is used and diverted to ensure that whatever benefit the user enjoys does not come at the expense of a disproportionate loss of access to the supply by other owners. And for the same reason, each water law system forbids one owner from monopolizing the resource or blocking access to a substantial portion of it. Yet the anemic level of judicial enforcement of these provisions—while probably greater than that seen in the oil and gas context—undermines the power of these doctrines to give effect to the waste principle. In the common law of water rights, the waste principle may seem to have more bark than bite.

2. Statutory Regulation of Water Waste

Growing demand for water, expanding urbanization, and recurring droughts have increased the public's interest in efficient administration and prevention of water waste. Several state legislatures have responded by codifying and modifying common law rules against waste for surface and groundwater appropriations.²²³ These modifications have taken significantly different

221. *Kurrle v. Walker*, 224 N.W.2d 99 (Mich. Ct. App. 1974).

222. *Madson v. Spokane Valley Land & Water Co.*, 82 P. 718 (Wash. 1905). Anti-monopoly concerns are particularly strong in western water law. In western states, constitutional provisions limit resource monopolies and protect access to waterways for purposes of appropriation, at times granting private parties the right to condemn ditches and canals.

223. Statutory modification of the common law of groundwater has been limited. Most states adopted either prior-appropriation or a reasonable-use-based doctrine to govern groundwater. Those groundwater waste statutes largely

forms in prior-appropriation and riparian states and, therefore, require separate discussion.

a. Prior Appropriation's Beneficial Use

Traditional principles of beneficial use have undergone significant statutory modification in certain jurisdictions. In response to changing societal values, legislatures have expanded the list of beneficial uses. Today, water statutes permit appropriation for an array of recreational and environmental purposes that lack a direct and measurable economic value and thus would not have qualified under traditional beneficial-use categories.²²⁴ Today, states condone as beneficial the act of leaving water in its channel for fish and wildlife maintenance and in-stream flow protection.²²⁵ Changing values have also led some legislatures to reclassify uses from beneficial to wasteful in order to conserve water, such as when Nevada authorized Las Vegas to prohibit use of water for artificial lakes and streams.²²⁶

The harmful impacts of water scarcity have also led some of the driest states to incur the costs of "crisis-inspired" legislation,²²⁷ by enforcing stricter statutory controls to improve efficiency of water diversions and use. For example, California statutorily requires that agricultural water supplies implement "efficient water management practices."²²⁸ Many other states have adopted legislation providing for critical groundwater management areas. These statutes overlay the doctrines of beneficial use and straightforwardly limit the amount of water allowed to all groundwater users.²²⁹

Legislative changes also inject the beneficial-use doctrine with noneconomic considerations and expand its scope to include public interests not previously considered. Under traditional

incorporated the limitations of the common law. *E.g.*, *City of Corpus Christi v. City of Pleasanton*, 276 S.W.2d 798, 800 (Tex. 1955). When states passed waste statutes that were inconsistent with common law waste doctrine, courts struck them down as unconstitutional takings of private property without compensation. *E.g.*, *Huber v. Merkel*, 94 N.W. 354, 370 (Wis. 1903). Texas courts still follow the common law rule of capture for groundwater.

224. Shupe, *supra* note 8, at 487-89.

225. TARLOCK, *supra* note 172, § 5:68.

226. *Id.*

227. Neuman, *supra* note 116, at 956.

228. CAL. WATER CODE § 10903 (West 1990); *accord* CAL. WATER CODE § 10902 (West 1990).

229. Neuman, *supra* note 116, at 948-53.

beneficial-use doctrine, the public interest was considered served if a water use generated some positive economic value for the appropriator. With the modern additions to the list of beneficial uses, uses of water that render no economic gain to appropriators may qualify as beneficial, whereas they would have been wasteful under prior law. Due to the costs of public administration and the political difficulty legislatures face when refining common law doctrines,²³⁰ states undertake significant modifications of beneficial-use doctrine only after water stocks become scarce and fully or over-appropriated. Thus, statutory waste controls increase concomitantly with the public's interest and resource scarcity.

b. Regulated Riparianism

Just as western states responded to water shortages with increased regulation, several eastern states have also displaced much of riparian doctrine by statute.²³¹ Eastern states increasingly regulate consumptive uses of waters at levels similar to western water law but based on principles of reasonable use rather than prior appropriation.²³² In general, riparian water codes require public permits before using water from a common source, and only “reasonable” or “beneficial” uses of water are entitled to permits. These terms are typically defined as a use of water that does not involve waste,²³³ which in turn is often defined as something like “causing, suffering, or permitting the consumption or use of the waters of the State for a purpose or in a manner that is not reasonable.”²³⁴ Riparian codes thus largely codify the antiwaste provisions of the common law doctrine but impose *ex ante* administrative permitting requirements instead of *ex post* judicial determinations of waste and reasonable use.²³⁵

230. *See id.* at 948–55.

231. Robert E. Beck, *The Regulated Riparian Model Water Code: Blueprint for 21st Century Water Management*, 25 WM. & MARY ENV'T L. & POL'Y REV. 113, 113 (2000).

232. 1 WATERS AND WATER RIGHTS § 6.01 (Amy K. Kelly ed., 3d ed. 2021).

233. *See id.* § 9.03.

234. REGULATED RIPARIAN MODEL WATER CODE § 2R-2-27 (AM. SOC'Y OF CIV. ENGRS 2004).

235. 1 WATERS AND WATER RIGHTS, *supra* note 232, § 9.03 (citing IOWA CODE § 455B.265(1), (2), (7) (West 2019)); *see* Joseph W. Dellapenna, *supra* note 175, at 85–90.

As in the West, eastern water codes often provide for maintenance of instream flows for environmental and aesthetic purposes.²³⁶ Since the judicial doctrine does not necessarily protect a minimum level of flow for aesthetic and environmental purposes,²³⁷ several states have enacted legislation protecting minimum flows through various means, “including withdrawal programs, reservation provisions, and minimum or preservation flow programs.”²³⁸ These statutory protections limit the exercise of common law riparian rights for the benefit of public values. Riparian codes that go beyond merely delineating and administering private rights and limit those rights in furtherance of a public interest are subject to the requirements of due process and the Takings Clause. As the Court in *United States v. Gerlach Live Stock Co.* explained, when requiring that downstream riparians be compensated for their loss of water to further the state’s highly inefficient upstream water reclamation project, “the public welfare, which requires [riparians] to sacrifice their benefits to broader ones from a higher utilization, does not necessarily require that their loss be uncompensated any more than in other takings where private rights are surrendered in the public interest.”²³⁹

IV. WASTE OF PUBLIC PROPERTY AND THE PUBLIC-TRUST DOCTRINE

Though courts do not often evoke “waste” itself, the waste principle also underpins the law governing management of public property. The common law public-trust doctrine requires governments to hold, administer, and manage public property as a kind of trustee for the public. Much like waste doctrine does in the private contexts described above, the public-trust doctrine prohibits the state from using, disposing of, or allowing private use of trust property in a manner that reduces its net total utility to the beneficiaries—namely the public at large. The doctrine therefore forbids a governmental trustee from allowing private parties to monopolize or make negative-sum uses of public

236. Lee P. Breckenridge, *Maintaining Instream Flow and Protecting Aquatic Habitat: Promise and Perils on the Path to Regulated Riparianism*, 106 W. VA. L. REV. 595, 596 (2004).

237. *Id.* at 595–97.

238. Lynda L. Butler, *Environmental Water Rights: An Evolving Concept of Public Property*, 9 VA. ENV'T L.J. 323, 344–51 (1990).

239. *United States v. Gerlach Live Stock Co.*, 339 U.S. 725, 752 (1950).

property.²⁴⁰ The function and evolution of the public-trust doctrine in these contexts mirror the private law's waste doctrine.

A. *Prohibiting Waste of Inherently Public Property*

The public-trust doctrine developed with respect to property that was public by virtue of its inherent physical characteristics—what Carol Rose calls “inherently public property.”²⁴¹ The physical characteristics of these resources render them an open-access commons, which is naturally nonexcludable and rivalrous among all members of the public.²⁴² Resources subject to the public-trust doctrine classically included submerged lands, shorelines, and wildlife²⁴³ and were limited to uses like fishing and navigation.²⁴⁴ Like waste in private law, however, the public-trust doctrine is adaptive to changing social values around use and utility.²⁴⁵ Courts since the 1970s, for example, have recognized public rights in recreational uses²⁴⁶ and in the perseveration of public resources for habitat, open space, and scientific study.²⁴⁷ Inherently public property nonetheless requires an

240. See generally Michael C. Blumm & Aurora Paulsen Moses, *The Public Trust as an Antimonopoly Doctrine*, 44 B.C. ENV'T AFFS. L. REV. 1 (2017) (characterizing privatization of certain natural resources as antithetical to the public-trust doctrine).

241. Carol Rose, *The Comedy of the Commons: Custom, Commerce, and Inherently Public Property*, 53 U. CHI. L. REV. 711, 720 (1986).

242. *Id.*; see also Richard A. Epstein, *The Public Trust Doctrine*, 7 CATO J. 411, 414 (1987) (describing such property as being held in common because common ownership “minimizes the bargaining problems associated with moving the asset to its highest-valued use”).

243. *Ctr. for Biological Diversity, Inc. v. FPL Group, Inc.*, 83 Cal. Rptr. 3d 588 (Ct. App. 2008).

244. *Arnold v. Mundy*, 6 N.J.L. 1, 71, 78 (1821).

245. *Marks v. Whitney*, 491 P.2d 374, 380 (Cal. 1971).

246. *Id.*; *Borough of Neptune City v. Borough of Avon-by-the-Sea*, 294 A.2d 47, 53 (N.J. 1972).

247. *S.F. Baykeeper, Inc. v. State Lands Comm'n*, 194 Cal. Rptr. 3d 880, 904–05 (Ct. App. 2015). Some judges have suggested expanding the doctrine in other ways, such as by requiring states to manage trust resources for both present and future generations' benefit. *E.g.*, *Citizens for Responsible Wildlife Mgmt. v. State*, 103 P.3d 203, 208 (Wash. Ct. App. 2004) (Quinn-Brintnall, J., concurring). Yet courts have been slower to extend the doctrine to protect new classes of natural resources, like the atmosphere. *Kanuk ex rel. Kanuk v. State*, 335 P.3d 1088 (Alaska 2014) (declining to declare the atmosphere a public trust resource); *accord* *Butler ex rel. Peshlakai v. Brewer*, No. 1 CA-CV 12-0347, 2013 WL 1091209, at *6 (Ariz. Ct. App. Mar. 14, 2013); *Filippone ex rel. Philippone v. Iowa Dept. Nat. Res.*, No. 12–444, 2013 WL 988627, at *2–3 (Iowa Ct. App. Mar. 13, 2013); *Aronow v. State*, No. A12-0585, 2012 WL 4476642, at *3 (Minn. Ct. App. Oct. 1, 2012); *Chernaik v. Brown*, 436 P.3d 26, 33–34 (Or. Ct. App. 2019).

organized system of management by a centralized public authority, acting as a fiduciary or “trustee” on behalf of the public, to avoid common pool problems like waste.²⁴⁸ Accordingly, the public-trust doctrine places limits on the state in managing inherently public property that are analogous to the limits waste doctrines impose on individual use of privately owned common pool property.

The public-trust doctrine generally prohibits the complete alienation of inherently public property to private transferees for nonpublic purposes.²⁴⁹ Such property necessarily loses its economic and noneconomic value to the public when privatized.²⁵⁰ The doctrine nevertheless permits private use of, and construction upon, inherently public property so long as the activity does not monopolize the property, block access to it, or otherwise substantially reduce its availability to the rest of the public.²⁵¹ This principle is demonstrated in the country’s earliest public trust cases.²⁵² Take, for example, the famous Supreme Court case *Illinois Central Railroad v. Illinois*, where the Court held the state could not permit a private party to monopolize control over the harbor of Lake Michigan.²⁵³ The Court explained that a state may grant private rights in submerged lands to erect wharves, docks, piers, and other structures, but only if they “aid in commerce” and “do not substantially impair the public interest in the lands and water remaining.”²⁵⁴ The Washington Supreme Court reiterated this point a century later, explaining that the public-trust doctrine “prohibits the State from disposing of its interest in the waters of the state in such a way that the public’s right of access is substantially impaired, unless the action promotes the overall interests of the public.”²⁵⁵ The public-trust doctrine requires that there must be some gain that

248. Rose, *supra* note 241; Epstein, *supra* note 242, 418–19.

249. See Epstein, *supra* note 242, at 417–18 (explaining that the public-trust doctrine prohibits private use of public property without just compensation).

250. *Id.* at 419–20.

251. Joseph L. Sax, *Public Trust Doctrine in Natural Resources Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471, 490 (1970).

252. *E.g.*, *Martin v. Waddell’s Lessee*, 41 U.S. (16 Pet.) 367, 408, 411, 418 (1842) (prohibiting a landowner from monopolizing control of oysters buried below the Raritan River’s ordinary high-water mark); *Arnold v. Mundy*, 6 N.J.L. 1, 71, 45–46, 65–66 (1821) (same).

253. *Ill. Cent. R.R. Co. v. Illinois*, 146 U.S. 387, 452–53 (1892).

254. *Id.*

255. *Rettkowski v. Dep’t of Ecology*, 858 P.2d 232, 239 (Wash. 1993).

justifies any public losses.²⁵⁶ Permitting a private monopoly over inherently public property violates the public-trust doctrine in the same way that monopolization of common pool property violates the waste principle—by permitting private uses that generate unjustified losses to the resource’s value to all its owners. It follows that a government “trustee” also must not permit a private party to damage or destroy the resource as to diminish its net total utility to the public at large. In this way, the public-trust doctrine forbids the same kind of self-serving behavior in the public realm as the doctrine of waste forbids in private common pool property and thereby preserves the corpus of commonly held resources from the most inefficient, destructive, and purposeless extractions.

B. Public-Trust Doctrine Cases as Waste Cases

As in the private context, uses of public-trust property violate the waste principle (and the public-trust doctrine) when they produce gains to a private party that pale compared with the resulting losses to the public.²⁵⁷ In fact, courts applying the public-trust doctrine expressly inquire whether the private use will result in a net reduction in the total utility of the resource to the public.²⁵⁸ Consider *Priewe v. Wisconsin State Land & Improvement Co.*, where the legislature conveyed title to a navigable lake to a private party for the purpose of dredging the lake and reselling the uncovered land.²⁵⁹ Citing *Illinois Central Railroad*, *Priewe* held that the conveyance violated the public-trust doctrine because it destroyed the rights of other owners of the

256. See Blumm & Moses, *supra* note 240, at 16 (noting the anti-monopoly aspect of the case).

257. The convergence of private waste and the public trust was on display in a recent case, *Mineral County v. Lyon County*, where the Nevada Supreme Court recognized that the public-trust doctrine applies to surface and groundwater owned by the state under prior-appropriation doctrine. *Min. Cnty. v. Lyon Cnty.*, 473 P.3d 418, 426 (Nev. 2020) (holding that the provisions of prior-appropriation law requiring beneficial use and curtailing water rights for waste satisfied the state’s public trust responsibilities).

258. See, e.g., *State v. Pub. Serv. Comm’n*, 81 N.W.2d 71, 74 (Wis. 1957) (“[I]mpairment must be weighed against the other public interests to be served and unless the impairment so viewed is substantial, the impairment is not a violation of the trust.”); *Wash. State Geoduck Harvest Ass’n v. Wash. State Dep’t of Nat. Res.*, 101 P.3d 891, 895 (Wash. 2004) (explaining the doctrine “obligates the state to balance the protection of the public’s right to use resources on public land with the protection of the resources that enable these activities”).

259. *Priewe v. Wis. State Land & Improvement Co.*, 67 N.W. 918 (Wis. 1896).

lake and the public “for the sole benefit of private parties.”²⁶⁰ Like an owner’s fencing off part of a lake or stream from other owners, the conveyance condemned the lake to all but one party, allowing him to monopolize its benefits. Additionally, the transferee’s monopoly made access to the lake by other owners and members of the public impossible, or at least prohibitively costly. Thus, for the same reason that these actions, if undertaken by a private riparian owner, would violate the waste principle, the public conveyance of the lake violated the public-trust doctrine.

In contrast, private uses of trust property that do not cause disproportionate public losses do not violate the public trust. Thirty years after *Priewe*, the same court again considered a legislative conveyance of submerged lands, this time upholding the conveyance. In *City of Milwaukee v. State*, the legislature granted the right to construct a slip dock extending 1,500 feet into the lake for the benefit of a private steel company as partial compensation for an earlier condemnation of its pier.²⁶¹ The court found that the proposed private dock would not significantly interfere with navigability of the vast Lake Michigan, and distinguished *Priewe* on those grounds. Despite creating a private benefit, the conveyance did not violate public trust because it produced private gains without diminishing the utility of the shoreline to the public at large.²⁶²

Changing environmental and water-scarcity concerns have led courts to broaden the scope of actions that violate the public-trust doctrine. At its inception, the doctrine simply prohibited the state from alienating trust property.²⁶³ However, in the 1983 case *National Audubon Society v. Superior Court*, the California Supreme Court required the state to affirmatively protect trust property by reviewing proposed state action for its effect on trust

260. *Id.* at 922.

261. *City of Milwaukee v. State*, 214 N.W. 820, 820 (Wis. 1927).

262. *Id.* at 829–30. In a similar case, *City of Madison v. State*, the court again weighed private gains against public losses to determine whether the state violated the public trust by filling in part of a navigable lake to build a civic center. The court upheld the state’s action on the grounds that the proposed building would be open to the public and devoted to public purposes, and that “the disappointment of those members of the public who may desire to boat, fish or swim in the area to be filled is negligible when compared with the greater convenience to be afforded those members of the public who will use the building.” *City of Madison v. State*, 83 N.W.2d 674, 678 (Wis. 1957).

263. *Arnold v. Mundy*, 6 N.J.L. 1, 71, 78 (1821); *Ill. Cent. R.R. v. Illinois*, 146 U.S. 387, 452–53 (1892).

resources.²⁶⁴ As is typical in waste cases in the private context, the *National Audubon Society* court did not tell the state *how* to manage its trust assets but rather merely furnished an outline of a governance process through which the competing interests in the property could be balanced.²⁶⁵ The public-trust doctrine's incremental common law expansion mirrors the evolution of waste. Just as concepts of waste grew to require minimum flows in streams under prior appropriation and riparianism, the public-trust doctrine grew to require the very same in *National Audubon Society*. Similarly, the problem of water scarcity caused the court to increase the doctrine's minimum requirements, much as the same problem caused courts to increase the minimum-efficiency requirements imposed by beneficial and reasonable use doctrines in water law. Here too, however, judicial enforcement of the doctrine has been limited primarily to extreme cases, leaving marginal violations of the waste principle unremedied.

Also, as in the private context, states often codify the vague provisions of the common law doctrine in an effort to improve their enforcement.²⁶⁶ In states where preserving natural resources is considered especially important, public-trust constitutional provisions tend to reach beyond the extent of the common law doctrine to impose greater limits on private use of public-trust property.²⁶⁷ While these constitutional amendments

264. *Nat'l Audubon Soc'y v. Superior Court*, 658 P.2d 709, 728 (Cal. 1983).

265. Erin Ryan, *The Public Trust Doctrine, Private Water Allocation, and Mono Lake: The Historic Saga of National Audubon Society v. Superior Court*, 45 ENV'T L. 561, 640 (2015). While pathbreaking in its extension of the public-trust doctrine to waters within tributaries, the jurisdictional trend outside of California generally has not followed *National Audubon Society*.

266. See Matthew Thor Kirsch, *Upholding the Public Trust in State Constitutions*, 46 DUKE L.J. 1169, 1169–70 (1997) (discussing state constitutional amendments).

267. Some of these merely incorporate the common law doctrine by limiting the ability of the state to give away public resources. *E.g.*, ALA. CONST. art. VIII, § 3; see also TEX. CONST. art. XVI, § 59(a); HAW. CONST. art. XI, § 1. Others, however, expand the scope of the common law doctrine. Some require the state to manage trust resources for the benefit of future as well as present generations. HAW. CONST. art. XI, § 1; see also MONT. CONST. art. IX, § 1; PA. CONST. art. I, § 27. Still others affirmatively require that the state provide a clean and healthful environment. PA. CONST. art. I, § 27; MONT. CONST. art. IX, § 1. Some provisions extend the public trust to include air, such as HAW. CONST. art. XI, § 1, taking a step that courts have hesitated to take on their own. See *Chernaik v. Kitzhaber*, 328 P.3d 799 (Or. Ct. App. 2014) (involving a claim that the state holds the atmosphere in public trust); see also Mary Christina Wood, *Advancing the Sovereign Trust of Government to Safeguard the Environment for Present and Future Generations (Part I): Ecological*

extend the doctrine beyond its common law boundaries, they do not absolutely prohibit private use and development of trust resources;²⁶⁸ rather, they permit uses that do not destroy the corpus of the trust.²⁶⁹ Constitutional public-trust provisions thus conserve the utility of trust resource for present and future use consistently with the waste principle—by preventing alienation or total degradation of the trust asset so as to substantially impair the public welfare interests the resource serves.²⁷⁰

V. THE MODERN RELEVANCE OF WASTE: LESSONS FOR PROPERTY THEORY AND FOR REENGAGING COMMON LAW COURTS IN ENVIRONMENTAL AND NATURAL RESOURCES MANAGEMENT

The waste principle and the common law doctrines it underpins are not dead law. The problems that plague modern property, environmental, and natural resources law are those that the waste principle is adept at handling: governance of commonly held resources. In fact, leading contemporary theories about property law envision, as normative goals, property arrangements that resemble the waste principle. Despite its potential to help resolve ongoing environmental and natural resources management problems, the common law of waste has been largely mothballed in favor of centralized, top-down statutory and regulatory controls. The modern turn away from reliance on the waste principle—and the common law more generally—has contributed to the law’s seeming inability to address society’s pressing resource-scale problems.

Drawing from contemporary theories of property, natural resources, and environmental law, Section V.A demonstrates how the waste principle forms an inextricable component of an efficient and liberal system of common property governance. Next, Section V.B observes how the decline in common law

Realism and the Need for a Paradigm Shift, 39 ENV’T L. 43 (2009) (proposing use of the public-trust doctrine to govern management of the atmosphere and other resources).

268. Jack R. Tuholske, *U.S. State Constitutions and Environmental Protection: Diamonds in the Rough*, 21 WIDENER L. REV. 239, 247 (2015).

269. Pa. Env’t Def. Found. v. Commonwealth, 161 A.3d 911, 939 (Pa. 2017).

270. *Id.*; State ex rel. Dep’t of Health & Env’t Scis. v. Green, 739 P.2d 469, 473 (Mont. 1987); State v. Bernhard, 568 P.2d 136, 138 (Mont. 1977); Alexandra B. Klass, *Modern Public Trust Principles: Recognizing Rights and Integrating Standards*, 82 NOTRE DAME L. REV. 699, 714–15 (2006).

enforcement of the waste principle, and the common law more generally,²⁷¹ and overreliance on statutory and regulatory controls has contributed to the law's seeming inability to address society's pressing resource-scale problems. While administrative regulation of common property importantly establishes baseline standards and rules to prevent certain harms, it depends on the waste principle to provide legitimacy, establish norms, and assure accountability by providing relief for redressable harms. Examining waste as a foundational principle to all property, this Article reimagines waste doctrine as what it could be rather than focusing on its limitations and diminished relevance in specific contexts. Toward that end, Section V.C examines three ongoing environmental and natural resources management problems where the waste principle could provide a useful tool for resolution: extending the public trust to the atmosphere, controlling venting and flaring of natural gas, and addressing harms caused by unregulated pollutants.

A. *Waste and Contemporary Property Theory*

1. Waste and Efficiency in Property Law

In operation, the waste principle tends to defer to the owners of a common resource to govern the resource to the extent it is practically workable. The practicability of leaving governance to owners depends on the scale of the resource and the number of potential interests and owners within the relevant property community. As such, applications of the waste principle run along a spectrum from private governance to complete public administration. Deference to self-governance is most practicable where a resource is owned by a single person in fee simple or where property is intentionally divided through private transaction, such as by the creation of legal life estates, thus giving parties opportunities to efficiently customize the rights and liabilities to their particular needs. Where parties have few opportunities to customize land interests, such as in the case of "collective but non-public property" arrangements, waste rules often take the form of nonwaivable statutory or regulatory

271. Joshua Ulan Galperin & Douglas A. Kysar, *Uncommon Law: Judging in the Anthropocene*, in CLIMATE CHANGE LITIGATION IN THE ASIA PACIFIC (Douglas A. Kysar & Jolene Lin eds., 2020).

duties.²⁷² These rules create baseline standards, encourage efficient use, and coordinate cooperation among owners through formal notice and hearing processes.²⁷³ Finally, for inherently public property like navigable waters and coastal resources, the law imposes a nondelegable duty on the government to restrain private uses to avoid waste.²⁷⁴

The waste principle thus tracks the Demsetz property thesis that land regimes develop to be cost minimizing.²⁷⁵ Forms of land ownership that typically involve few owners who share preexisting social relationships, such as split and successive estates in land, require little legal regulation because transaction and information costs are low and the property is conducive to informal private management.²⁷⁶ For these forms of ownership, waste doctrine provides a backstop against monopolization and destruction of the property if the owners' interests diverge but encourages owners to develop their own set of rules for the property. However, as the number and location of potential owners becomes more diffuse, transaction and information costs often prevent owners from engaging in voluntary, self-initiated governance.

Thus, common law restrictions crystalize into statutes and administrative rules to overcome the transaction costs and coordination problems that prevent large numbers of strangers from effectively cooperating and enforcing their rights against waste. Though costly to administer, public regulation may lower transaction costs by identifying and notifying affected landowners, promulgating clear rules, monitoring and enforcing compliance, and instituting formal consultation and hearing procedures when owners wish to deviate from the baseline rules. By connecting owners and creating clear rules for use, administrative regulation of common pool resources enables owners to communicate and aggregate interests through pooling, joint operations, and market transactions.

Finally, where transaction costs would be completely unwieldy due to the public nature of the property, legislative and

272. Carol Rose, *Left Brain and History in the New Law and Economics of Property*, 79 OR. L. REV. 479 (2000).

273. *McCord v. Oakland Quicksilver Mining Co.*, 27 P. 863 (Cal. 1883).

274. Robert C. Ellickson, *Property in Land*, 102 YALE L.J. 1315, 1320–21 (1993).

275. Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. 347, 347 (1967).

276. Ellickson, *supra* note 274.

executive branches of government execute their public trust responsibilities through myriad statutes and regulations governing private uses of public resources, within the constraints of the waste principle. Though large-scale public regulation is highly expensive, it is necessary to overcome the efficiency challenges of coordinating competing uses of inherently public assets.

The waste principle also mediates competing property interests across time in a cost-minimizing fashion. Whereas it has been said that most legal policies “are skewed toward the present while marginalizing the future,” thus “discounting the value of future benefits” in favor of the present,²⁷⁷ waste law is both historically informed and forward looking. It provides greater deference to future interests—which are presumed to be longer in duration and more durable—than present interests when examining uses that may present net utility losses. Waste’s limitations on common pool uses, both in limited and open-access commons, are also skewed toward the future, elevating conservation interests above the individual gain of any user. As such, the waste principle enables governance across four dimensions—across property boundaries at all depths and looking forward to the future.

Because of its forward-looking nature, waste also avoids the pitfall of treating resources as inexhaustible. Waste resists negative-sum changes to land, inherently pricing environmental attributes. It affords value to uncut trees, oil in the ground, water in streams, and the navigability of lakes and oceans—not because of some intrinsic value, but because of their potential utility to future users. Thus, waste grants future owners entry into conversations regarding present use of property to constrain present owners from plundering and contaminating the natural resources.²⁷⁸

2. Waste and Liberal Self-Governance

Early statutory regulation of waste and the common law waste principle mediated private and public rights in common property in a pragmatic fashion. This approach sits in contrast with many contemporary theoretical approaches to addressing commons problems, which tend to prescribe either extensive

277. JAN LAITOS, WHY ENVIRONMENTAL POLICIES FAIL 3 (2017).

278. *See id.* at 10 (asserting that economic systems “plunder and contaminate”).

privatization or “illiberal communitarian solutions” and centralized control.²⁷⁹ Others, like Hanoch Dagan and Michael Heller, have challenged this binary framework and advanced alternative legal reforms that would combine elements of property and regulation.²⁸⁰ Through the waste principle, the law takes a practical “all of the above” approach. It deploys a wide range of solutions from private to public and everything in between, specifying the mix of private rights and public regulation that defines any given commons based on its particular qualities.²⁸¹ In this way, the waste principle exhibits several aspects of Dagan and Heller’s concept of a “liberal commons.”²⁸²

In Dagan and Heller’s framework, a liberal commons provides for “spheres of individual dominion, democratic self-governance, and cooperation-enhancing exit” and aims at “facilitating trust and cooperation (strengthening social values) and generating prosperous use (maximizing economic gain).”²⁸³ The waste principle defines the actions that an individual commoner may take with respect to the common property without seeking the permission of or offering any justification to fellow commoners. It thus demarcates a sphere of individual autonomy. This sphere is marked off by the availability of injunctive relief and damages, which compel communication and cooperation.²⁸⁴ Rather than leave the commoners to “laborious contract for their own liberal commons or suffer[] under existing background rules,”²⁸⁵ the waste principle furnishes a basis for public administration to overcome the barriers to cooperation in commons with numerous unfamiliar owners.

Like a liberal commons, the waste principle proscribes both overutilization and underinvestment (or free-riding) in the

279. Hanoch Dagan & Michael A. Heller, *The Liberal Commons*, 110 YALE L.J. 549, 551–52 (2001).

280. *E.g.*, *id.* at 551–53; Rose, *supra* note 123, at 129.

281. *See* Henry E. Smith, *Semicommon Property Rights and Scattering in the Open Fields*, 29 J. LEGAL STUD. 131, 131 (2000) (discussing the mix of public, common, and private ownership in semicommons).

282. Dagan & Heller, *supra* note 279, at 553.

283. *Id.* at 582.

284. *See* Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1092 (1972) (explaining that property rules require one to negotiate a price with the owner to remove the entitlement); *see also* Elinor Ostrom et al., *Covenants With and Without a Sword: Self-Governance Is Possible*, 86 AM. POL. SCI. REV. 404, 414 (1992) (demonstrating the efficacy of enforceable rules in enabling the self-governance of common pool resources).

285. Dagan & Heller, *supra* note 276, at 603.

commons. For example, the principle proscribes underinvestment by prohibiting permissive waste and curtailing appropriative water rights based on the use of highly inefficient means of diversion or conveyance, both of which may require owners to take affirmative action. Additionally, the role of waste law in commons governance is “constrained” in the sense that it aims only to set a bottom limit for permissible activities within the common pool. It is also “indispensable” because it provides a necessary check on monopolization and opportunism that can irreparably destroy or undermine a resource’s value. And finally, like a liberal commons model, the waste principle accounts for both economic and social goods in defining impermissible, negative-sum transactions within the common property. Its hands-off approach is suited to “generating prosperous use (maximizing economic gain),”²⁸⁶ yet it constrains overutilization where economic gains are outweighed by social losses (to the commoners as well as the public).

By strengthening the autonomy of individual owners, the waste principle fosters community self-governance on both a macroscale and microscale. As Eduardo Peñalver suggests, property also socializes people and binds them together into groups organized around shared norms, geography, common interests, and the need for market transactions.²⁸⁷ Thus, property reinforces self-sufficiency as something that must be exercised according to community values and “in service to human existence.”²⁸⁸ The waste principle promotes self-sufficiency of the property community by minimizing the need for external interactions. For instance, in many oil and gas regulatory proceedings, only members of the community—owners of property within the immediate vicinity—have a right to participate in proceedings regarding uses of the property. At a microscale, the waste principle encourages individual autonomy by permitting nonwasteful uses without cooperation of other members within the community. Only where an owner’s use would result in net losses to the relevant community can that community impose internal discipline. The principle catalyzes the sort of self-governance that Peñalver’s conception of property envisions—a regime that binds individuals together as part of a group of

286. *Id.* at 582.

287. Eduardo M. Peñalver, *Property as Entrance*, 91 VA. L. REV. 1889, 1891 (2005).

288. *Id.*

common property owners while balancing the demands of freedom and community in support of societal values.²⁸⁹

The waste principle can help “mediate liberty and cooperation” not only within individual commons but also, to an extent, within the polity at large.²⁹⁰ As Rose has written, property rights complement economic and political values by diffusing political power, “elucidating people in the patterns of give-and-take on which democracy depends,” and furnishing a concrete symbol for property owners of their being rights holders and secure citizens.²⁹¹ Per Rose, “Democracies require some of the same cultural traits that property and commerce do: respect for the rights of others, an appeal to voluntary agreement rather than force, the channeling of self-interest into cooperation for mutual benefit.”²⁹² As Rose explains, however, private property may have a deleterious effect on political virtues where it leads to unregulated monopolies or other inefficiencies.²⁹³ Just as it adjusts to strike a workable balance between private rights and regulation to control problems of overutilization and underinvestment, the waste principle also maximizes the political value of common property rights. It gives maximum effect to private property where it is most likely to elucidate traits of civic virtue and self-governance, namely when it is solely owned. The principle then increasingly regulates the exercise of private rights as needed to avoid monopolization of resources and accompanying political power in individual hands. In so doing, the waste principle systematically circumscribes common property rights in a manner that maximizes their positive political effects on a liberal democratic system.

B. Reengaging Common Law Courts in Environmental and Natural Resources Management

Waste contributes to current understandings of environmental regulation and natural resources management but with

289. *Id.* at 1961.

290. Dagan & Heller, *supra* note 276, at 554.

291. Carol M. Rose, *Privatization—The Road to Democracy?*, 50 ST. LOUIS U. L.J. 691, 700–18 (2006) [hereinafter Rose, *Privatization*]; see also Carol M. Rose, *Property as the Keystone Right*, 71 NOTRE DAME L. REV. 329, 329–30 (1996) [hereinafter Rose, *Property as the Keystone Right*] (discussing the centrality of property rights in economic, connotational, and political ordering).

292. Rose, *Privatization*, *supra* note 291, at 718.

293. *Id.*

much greater urgency. Viewed across its various contexts, waste emerges as a doctrine that is sensitive to evolving norms yet durable in its principles and that reinforces liberal ideals of individual autonomy and self-governance. Combined with its efficient scale and future-looking perspective, these attributes give waste the capacity to facilitate self-governance in environmental problem solving. Yet the promise of waste doctrine to resolve environmental problems is largely unrealized. Its underenforcement by common law courts has increasingly left environmental and natural resource governance to administrative law, which has caused an astounding proliferation of laws and regulations without resolving many of the most pressing resource-scale problems. Nevertheless, a renewed recognition of and respect for the waste principle could reengage common law courts toward a more responsive and adaptive system of environmental governance.

1. The Disappearing Common Law Court

As the preceding discussions of waste in land law, oil and gas law, and water law demonstrate, the common law of waste was once of much greater importance than today. Today's waste law, particularly in the cases of water and oil and gas, is primarily statutory and regulatory law. The common law accordingly plays a smaller role. So, too, do courts, despite their authority to enforce statutory and regulatory prohibitions on waste.²⁹⁴ "The prohibitions against waste," one scholar observed, "are mostly hortatory concepts that rarely result in cutbacks in water use."²⁹⁵ When petitioned by private parties to curtail waste, courts hesitate to do so, whether out of concern for potential regulatory takings, lack of jurisdiction, or deference to the political branches or administrative agencies.

To the extent that courts hesitate to curtail the use of common resources because of the specter of sanctioning a regulatory taking, the waste principle furnishes a constitutional justification for environmental regulation that is fully consistent with even a classical liberal approach. Common law prohibitions

294. The lack of serious enforcement, judicial or administrative, of waste provisions has been observed especially in water law, where it has been said that "[j]udicial sanction of inefficient techniques allows billions of gallons of irrigation water to be diverted daily from western streams and aquifers without being used by crops." Shupe, *supra* note 8, at 484.

295. Neuman, *supra* note 116, at 922.

against waste are inherently limited in ways that, without supplementation by some public regulation, undermine the security and value of the private rights they exist to protect. First, as the Supreme Court recognized in the early days of statutory waste regulation in *Ohio Oil Co. v. Indiana*, a common pool natural resource can be irreparably destroyed by any of the owners in an instant, necessitating ex ante prohibitions to *prevent* waste from occurring in the first place.²⁹⁶ Second, commons with large numbers of co-owners are plagued by coordination problems, which often preclude both development of contractual ex ante regulation and cooperative enforcement through litigation ex post. Public regulation that simply gives effect to the waste principle as it exists at common law does no violence to common law rights (quite the opposite) and is consistent with the narrowest conception of the police power.²⁹⁷

When legislatures or agencies impose regulation that is more stringent than the background waste doctrine (as they tend to do when demands on resources grow in intensity), the constitutional foundation for the regulation moves from the police power to the power to regulate private property for a public purpose and must be consistent with due process and the Takings Clause.²⁹⁸ Conceptually, however, proper application of the waste principle to limit the use of shared resources should never result in a taking. The principle circumscribes the extent of private rights in common resources at common law; its mere enforcement thus does not curtail existing rights but rather protects them from curtailment. Consequently, the Takings Clause should rarely (if ever) present a real problem for appropriate administrative and judicial enforcement of waste regulations in water and oil and gas law.

The likelier sources of judicial underenforcement are a lack of jurisdiction or deference to administrative agencies and the political branches. Consider a recent case, *Vogel v. Marathon Oil Co.*, where the court declined to recognize the viability of a common law claim for waste of a common pool of natural gas in light

296. *Ohio Oil Co. v. Indiana*, 177 U.S. 190, 201 (1900).

297. *E.g.*, RICHARD A. EPSTEIN, TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN 107–25 (1985) (extolling such a view of the police power).

298. *See Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104 (1978) (discussing regulatory takings doctrine); *e.g.*, *United States v. Gerlach Live Stock Co.*, 339 U.S. 725, 752 (1950) (requiring riparians be compensated for their loss of water to further the state's reclamation project).

of a scheme of statutory enactments and regulations.²⁹⁹ Vogel sued Marathon, which operated the oil and gas lease on Vogel's minerals, alleging that Marathon had flared natural gas produced from the lease in violation of North Dakota's statutory prohibition on flaring, which required payment of a royalty on gas flared in excess of the statute.³⁰⁰ She asserted a private right of action under North Dakota's statute, as well as common law claims for conversion and waste.³⁰¹ The court denied all her claims, finding that there was no private right of action under the anti-flaring statute and that the statute preempted her common law waste claim.³⁰² It reasoned that the statute was intended to occupy the field of waste regulation and that it could not be construed as complementary with the common law of waste because, unlike the common law, it permitted flaring during the first year of production from a well.³⁰³ Thus, the court resolved the conflict between the common law and the statute in favor of the laxer waste regulation in the statute.³⁰⁴ Finding that the plaintiff had failed to exhaust her administrative remedies, the court dismissed Vogel's suit and permitted Marathon's flaring to continue.

2. The Limits of Environmental Regulation

As *Vogel* demonstrates, the encroachment of statutory waste regulation into the common law sphere does not uniformly benefit environmental and natural resource conservation. In addition to abrogating potentially powerful common law claims, codification and regulation has led to a fragmented and complicated regime of piecemeal regulations that are often unable to adapt to changing circumstances and can quickly become obsolete. Without common law claims like waste as a meaningful complement, environmental statutes and regulations are not adequately addressing major resource-scale problems like climate change.

The waste principle provides a useful counterpoint to contemporary environmental law. The waste principle can manage problems across an endless variety of commons—from life

299. *Vogel v. Marathon Oil Co.*, 879 N.W.2d 471 (N.D. 2016).

300. *Id.* at 474–75.

301. *Id.*

302. *Id.* at 482–83.

303. *Id.*

304. *Id.*

tenancies in small farmsteads to publicly owned submerged lands—because it is a simple, objective abstraction. It is a neutral, generally applicable concept, as opposed to a set of rigidly particularized rules or standards designed to address specific situations. Responding to myriad environmental problems occurring within enormously complex natural systems,³⁰⁵ environmental statutes (like the federal Clean Air and Clean Water Acts) take a complex but fragmented, inconsistent, and unsystematic approach to internalizing polluters' negative externalities.³⁰⁶ Treating individual environmental hazards in isolation and with voluminous and minutely technical regulations helps drive problems of “regulatory accretion”³⁰⁷ and overaccumulation of laws—the so-called “hyperlexis” phenomenon.³⁰⁸ While academics have largely ignored it,³⁰⁹ the concern that there are simply too many particularized laws and regulations has traction among practicing lawyers.³¹⁰ Whereas the fear of

305. Jan G. Laitos & Lauren Joseph Wolongevicz, *Why Environmental Laws Fail*, 39 WM. & MARY ENV'T L. & POL'Y REV. 1, 43–44 (2014) (characterizing the environment as complex and adaptive).

306. See Adam Babich, *Too Much Science in Environmental Law*, 28 COLUM. J. ENV'T L. 119, 122–23 (2003) (“EPA sets standards on an inconsistent, *ad hoc* basis.”); Robert W. Adler, *Integrated Approaches to Water Pollution: Lessons from the Clean Air Act*, 23 HARV. ENV'T L. REV. 203, 203–05 (1999) (noting the lack of integration under the Clean Water Act); see also Robin Kundis Craig, *Climate Change, Regulatory Fragmentation, and Water Triage*, 79 U. COLO. L. REV. 825, 849–69 (2008) (reaching a similar conclusion about the Clean Water Act); Dave Owen, *Mapping, Modeling, and the Fragmentation of Environmental Law*, 2013 UTAH L. REV. 219, 219–25, 239–40 (2013) (juxtaposing the “dysfunctions of fragmented regulation” against the integrated complexity of natural systems and science’s increasing ability to model and map those complexities).

307. J.B. Ruhl & James Salzman, *Mozart and the Red Queen: The Problem of Regulatory Accretion in the Administrative State*, 91 GEO. L.J. 757, 763, 800–23 (2003) (identifying the phenomenon of regulatory accretion and the resulting regulatory burden).

308. Bayless Manning, *Hyperlexis: Our National Disease*, 71 NW. U. L. REV. 767 (1977). *Contra* Mila Sohoni, *The Idea of Too Much Law*, 80 FORDHAM L. REV. 1585, 1586–91, 1622–31 (2012) (critiquing “hyperlexis”).

309. Ruhl & Salzman, *supra* note 307, at 762 n.13. *But see, e.g.*, RICHARD A. EPSTEIN, SIMPLE RULES FOR A COMPLEX WORLD 3 (1995) (discussing the explosion of federal regulation).

310. *E.g.*, John Freemuth, *Environmental Policy Getting Too Dense*, 40 ADVOCATE 10, 12 (1997) (“We’ve got too many conflicting laws right now. . . . I can’t keep up and I write and teach in environmental policy.”); see Jeff Civins, *Lender Concerns Under Environmental Laws*, 20 STATE BAR TEX. ENV'T L.J. 93, 93 (1990) (“[R]egulatory schemes are complex and the definitions and acronyms seem to be calculated to confuse the regulated community.”); see also Bayless Manning, *Too Much Law: Our National Disease*, 33 BUS. LAW. 435 (1977) (critiquing “hyperlexis”); Edward T. McMahon & Sharon Irish, *Too Much Law*, 6 UPDATE ON L.-RELATED EDUC. 7 (1982) (discussing the proliferation of lawsuits and arbitrations); Richard

irreparable harms leads to enactment of centralized laws and complex regulation to redress the most immediate environmental threats, the separate and particularized nature of this approach creates the possibility of error and produces laws that ultimately may not be scalable to address new and diffuse impacts. The fragmented and inflexible approach of modern environmental regulation may also contribute to the problem of statutory “obsolescence.”³¹¹ As circumstances change and technologies evolve, courts and bureaucrats encounter difficulty filling the gaps left behind by outdated statutes. The literature on this problem, dating back to Pound and Cardozo, has grown increasingly skeptical in the current era of “unprecedented congressional paralysis” and new environmental challenges like climate change, which existing statutes simply do not address.³¹²

The waste principle, in contrast, has been with us much longer than any federal environmental law yet has never *truly* fallen into obsolescence. By taking into consideration changing information and community standards of good husbandry, the waste principle is inherently adaptable to new challenges and changing human and natural circumstances. Unlike statutory environmental laws that elevate one value (be it limiting emissions or preserving historic property), waste doctrine empowers courts to consider numerous competing private and public values to assess how property use shifts welfare. It thereby serves as a counterpoint to the contemporary mode of environmental lawmaking. And it may have significant normative power for designing an effective, adaptive, and simpler regulatory approach to greenhouse gas emissions, as well as any number of other environmental problems that are not addressed by an existing statutory scheme.

Thigpen, *Hyperlexis: The Problem of Too Much Law*, 39 ALA. LAW. 411 (1978) (addressing newly licensed attorneys on the growing problem of hyperlexis).

311. See generally Donald C. Langevoort, *Statutory Obsolescence and the Judicial Process: The Revisionist Role of the Courts in Federal Banking Regulation*, 85 MICH. L. REV. 672 (1987).

312. Jody Freeman & David B. Spence, *Old Statutes, New Problems*, 163 U. PA. L. REV. 1, 3–5 (2014); see also GUIDO CALABRESI, A COMMON LAW FOR THE AGE OF STATUTES 33 (1982); Benjamin N. Cardozo, *A Ministry of Justice*, 35 HARV. L. REV. 113, 114 (1921); Henry J. Friendly, *The Gap in Lawmaking—Judges Who Can't and Legislators Who Won't*, 63 COLUM. L. REV. 787, 792 (1963); Roscoe Pound, *Anachronisms in Law*, 3 J. AM. JUDICATURE SOC'Y 142, 144 (1920)).

C. Reengaging Waste and Common Law Courts to Address Contemporary Environmental Problems

There are several live, on-the-ground environmental and natural resources management issues for which the waste principle presents new and helpful ways of thinking about the problem and offers possible concrete legal solutions. Applying the waste principle as a standard that is inherent within the common law and independent of the limits of its various specific iterations in doctrine reveals its potential as a forward-looking mechanism to resolve contemporary environmental problems.

1. Applying the Public-Trust Doctrine to the Atmosphere

As statutory and regulatory efforts to address greenhouse gas emissions head-on are stalled and stymied by politics and bureaucratic delay, environmental advocates have increasingly turned to the courts to find redress for climate harms under the public-trust doctrine. These efforts have largely failed for reasons relating to the murkiness of the doctrine's scope, substantive requirements, and justiciability as applied to the atmosphere. The study of waste sheds new light on each of these issues.

As discussed in Part IV, the need for the public-trust doctrine springs from the very set of conditions that necessitate waste doctrine in private law—collective ownership of common resources. And its bare-minimum requirements are the same as private waste law: private uses of public trust resources are permitted only if they generate more gains than public losses. Recognizing that the public-trust doctrine is simply a public-law analog of the private law of waste may lend clarity and substance to both fields.

Three aspects of the public-trust doctrine's scope and justiciability may be clearer when understood in the broader context of the waste principle. First, litigants in so-called "atmospheric trust" cases have struggled to persuade courts to apply the public-trust doctrine to the atmosphere,³¹³ yet the atmosphere would clearly be subject to the waste principle as articulated

313. *E.g.*, *Chernaik v. Brown*, 475 P.3d 68, 72, 83–84 (Or. 2020) (declining to extend the doctrine, which it holds only "encompasses submerged and submersible lands underlying navigable waters and the navigable waters themselves").

here, as it is subject to the concurrent and successive use claims of multiple individuals. Second, a split is developing among state courts on the question of whether the public-trust doctrine sounds in traditional property principles of trust law or is a narrower, *sui generis* public-law doctrine. On one side, there are courts that consider the government's trust responsibilities over public natural resources to mirror the responsibilities of a trustee under private-law concepts, including that the government must act as fiduciary of the public in dealing with the corpus of the public trust.³¹⁴ On the other side of the split are courts that reject the position that the state has the same fiduciary duties over publicly held natural resources as the trustee of a common law private trust would have.³¹⁵ Viewed as part of a system of common property management that is undergirded by the waste principle, the public-trust doctrine clearly emerges as an extension of private-law concepts. The opposing position confuses the connection between public and private property law and undermines the system of liberal governance the waste principle helps to structure.

Third, and finally, courts have denied relief to atmospheric public trust claimants on the grounds that such claims are not redressable by courts and, thus, not justiciable.³¹⁶ Here again, the waste principle may supply a more productive way of thinking about the public-trust doctrine. Courts generally have no trouble remedying violations of the waste principle at common law. Rather than involve themselves in the messy business of prescribing uses and allocations of common resources, courts in private common law waste cases usually award money damages or enjoin ongoing wasteful conduct. The details of the resolution—how the parties subsequently go about sharing the resource—are left to the parties' own decision-making. Only in rare circumstances, such as claims of economic waste of shared oil and gas resources, do courts find the difficulty of fashioning

314. *Pa. Env't Def. Found. v. Commonwealth*, 161 A.3d 911, 932–35 (Pa. 2017); *accord* *State v. Mathis*, 223 P.3d 1119, 1122–24 (Utah 2009) (holding that the state's public-trust responsibilities for state school lands include the "fiduciary obligations of a trustee").

315. *E.g.*, *Chernaik*, 475 P.3d at 72.

316. *E.g.*, *Juliana v. United States*, 947 F.3d 1159, 1169–74 (9th Cir. 2020) (citing *Rucho v. Common Cause*, 139 S. Ct. 2484, 2500 (2019)) (finding plaintiffs' claims nonjusticiable because "there was no 'limited and precise' standard discernable" for redressing the asserted violation).

a remedy for alleged waste to be disqualifying.³¹⁷ The onus of translating these principles to the context of an atmospheric trust claim rests on claimants, who should take instruction from private waste cases in how to articulate their prayer for relief, as well as on courts, which may find private waste remedies to be a useful analogy in redressing atmospheric trust claims.

2. Controlling Natural Gas Venting and Flaring

Another contemporary problem—uncontrolled venting and flaring of natural gas—implicates governance of the atmosphere as well as common pools of natural gas. Around the world, but in the United States in particular, oil and gas producers vent and flare immense and unprecedented quantities of natural gas.³¹⁸ Venting releases the natural gas, comprised in its dry state of methane, directly into the atmosphere, while flaring combusts the gas and emits carbon dioxide.³¹⁹ The climate impact of these methane and carbon dioxide emissions is significant.³²⁰ In addition to causing these greenhouse gas emissions, venting and flaring dissipate billions of cubic feet of natural gas from common reservoirs every year. The potential value of these reserves is itself enormous: by one estimate, the volume of gas vented and flared annually in the United States would power over six million homes for an entire year.³²¹

The results of venting and flaring—loss of reserves and massive greenhouse gas emissions—are obviously problematic, yet the activity largely falls outside the reach of federal environmental laws. Recent attempts to stretch the Clean Air Act to address methane emissions from oil and gas operations demonstrate the problem of statutory obsolescence and the challenges of relying

317. See *supra* Section III.B.1.

318. See Kim Talus & Cheri R. Hasz, *Economic Waste and Environmental Problems: Natural Gas Flaring in Texas*, in *DECARBONISATION AND THE ENERGY INDUSTRY: LAW, POLICY AND REGULATION IN LOW-CARBON ENERGY MARKETS* 107 (Tade Oyewunmi et al. eds., 2020).

319. 8 MARTIN & KRAMER, *supra* note 134 (definition of “venting” and “flaring”).

320. See *New Analysis Reveals Persistent Methane Problem*, ENV'T DEF. FUND: N.M. OIL & GAS DATA, <https://www.edf.org/nm-oil-gas> [<https://perma.cc/U8HJ-69NV>].

321. Mark Agerton et al., Rice Univ.'s Baker Inst. for Pub. Pol'y, *The Economics of Natural Gas Flaring in U.S. Shale: An Agenda for Research and Policy* 2–3 (July 24, 2020) (unpublished working paper), <https://www.bakerinstitute.org/media/files/files/03160f6a/ces-agerton-et-al-naturalgas-072420.pdf> [<https://perma.cc/QV6S-C5JY>].

on the political branches to address new problems through law-making and rulemaking. In 2016, the Obama Administration EPA promulgated New Source Performance Standards for methane emissions from newly constructed oil and natural gas wells and pipelines.³²² Four years later, the Trump Administration EPA rolled back much of the substance of these restrictions.³²³ Then, less than a year later, the most drastic provisions of these rollbacks were “disapproved” by a joint resolution of Congress under the Congressional Review Act and deemed never to have taken effect.³²⁴ Similarly, efforts by the Department of the Interior to extend its land management regulations to the practice through the Methane Reduction Rule were overturned because the principal purpose of the rule, regulation of GHG emissions, was found to be outside the agency’s authority.³²⁵ The endless seesaw of federal regulatory change has left venting and flaring to be regulated by state conservation agencies based on state statutes that generally prohibit the waste of natural gas, but which rarely authorize consideration of cumulative atmospheric impacts.

Administrative management of the cumulative impacts of venting and flaring as waste is difficult, however, because much venting and flaring is not purposeless.³²⁶ It is done during the normal course of drilling and repair operations and is often necessary to release pressure and avoid emergencies. The latest rise in venting and flaring is thanks to the rapid development of new shale plays where pipeline infrastructure to take natural gas from the wellhead to market has yet to be constructed.³²⁷ In these plays, oil producers often lack a place to go with the associated natural gas, leading them to either vent, flare, or shut in their producing oil wells. In light of the need for some venting and flaring, many oil and gas producing states, like Texas, have taken a lax approach to regulating the practice.³²⁸ In contrast, New Mexico recently adopted regulations to virtually eliminate

322. 40 C.F.R. §§ 60.5360a–60.5439a (2020) (“Subpart OOOOa”).

323. 85 Fed. Reg. 57,018 (Sept. 14, 2020) (to be codified at 40 C.F.R. § 60); 85 Fed. Reg. 57,398 (Sept. 15, 2020) (to be codified at 40 C.F.R. § 60).

324. S.J. Res. 14, 117th Cong. (2021).

325. *State v. U.S. Dep’t of Interior*, 493 F. Supp. 3d 1046 (D. Wyo. 2020).

326. See Joseph A. Schremmer, *Regulating Natural Gas Venting and Flaring as Waste: A Review of the New Mexico Approach*, OIL GAS & ENERGY L. (2022), <https://www.ogel.org/article.asp?key=4018> [<https://perma.cc/WRJ3-2TCH>].

327. *Id.*

328. Talus & Hasz, *supra* note 318.

all routine venting and flaring.³²⁹ The all-or-nothing approach of state regulators threatens to sanction significant greenhouse gas emissions and loss of resources, on the one hand, or curtail legal and necessary uses of hydrocarbon reserves, on the other.³³⁰

A more nuanced approach is needed to balance the costs and benefits of venting and flaring. That approach is the waste principle. Where regulations permit venting and flaring that wastes natural gas reserves, waste doctrine may provide an avenue for a judicial remedy to address the costs and benefits of such operations. The waste doctrine empowers courts to provide other reservoir owners with damages for wasted gas, to enjoin venting and flaring in violation of the principle, or to overturn agency flaring authorizations that violate statutory prohibitions on waste, thus compelling regulatory agencies to consider how venting and flaring limitations could be drafted to reflect the net-welfare standard implicit in the waste principle.

3. Remediating Unregulated Pollution

A third contemporary problem facing environmental law, how to address pollutants for which no specific regulation exists, owes its existence to the larger issue of statutory obsolescence. The leading example of problematic unregulated pollutants are per- and poly-fluoroalkyl substances (PFAS). These chemicals are used in a diverse array of commercial and household products like food packaging and Teflon.³³¹ PFAS are persistent in the environment, particularly in soil and groundwater, meaning they accumulate and do not break down.³³² Moreover, PFAS contamination has been linked to increased cholesterol, low infant birth weights, immunological problems, and even cancer.³³³ Concerns about the health impacts of PFAS have been

329. Schremmer, *supra* note 326.

330. *Id.* (illustrating how New Mexico's elimination of venting and flaring violates the waste principle as applied to certain uses of venting and flaring).

331. *Basic Information on PFAS*, EPA, <https://www.epa.gov/pfas/basic-information-pfas> [<https://perma.cc/JB24-F72M>].

332. *Id.* In addition to exposure through consumer products, environmental contamination principally results from disposal of PFAS waste streams, which move contaminants into the environment either in the air through incineration or into the soil and water through wastewater treatment or landfilling. Tasha Stoiber et al., *Disposal of Products and Materials Containing Per- and Polyfluoroalkyl Substances (PFAS): A Cyclical Problem*, 260 CHEMOSPHERE 127659 (2020).

333. *Basic Information on PFAS*, *supra* note 331.

documented for at least twenty years. Since then, the EPA has acted to regulate PFAS based on its authority in the Toxic Substances Control Act, the Safe Drinking Water Act, and the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”).³³⁴ Since 2002, it has promulgated several Significant New Use Rules to limit and monitor new contamination; initiated the process for listing certain PFAS as CERCLA hazardous substances; promulgated new rules of disposal of PFAS waste streams; and taken other actions to identify, prevent, and remediate PFAS contamination.³³⁵ In October 2021, the EPA announced a “PFAS Strategic Roadmap” setting forth a plan for future policy- and rulemaking.³³⁶ Although these actions have begun the process of regulating PFAS, they have also demonstrated the lag between emergence of new environmental issues and development and amendment of comprehensive statutory and regulatory programs.

The waste principle represents a ready means for courts to step into the breach. Well before the EPA developed new rules, common law courts applying the waste principal could have acted to enjoin contamination that violated the waste principle or compensated injured plaintiffs in damages. Advocates for owners of contaminated groundwater aquifers, for instance, could pursue a claim for waste against another owner in the common aquifer who caused a discharge of PFAS into the aquifer. The plaintiff would need to show that the defendant’s use of the common aquifer failed to produce a legitimate benefit to offset the harm it caused to the plaintiff’s (and other owners’) loss of the ability to use the resource safely. Given that releasing PFAS into a common aquifer could render the entire resource unusable by the other owners, the defendant’s actions may well amount to an impermissible monopoly of the aquifer. A waste claim of this nature could supplement more familiar types of claims, such as nuisance or negligence, and could avoid some of the practical and procedural difficulties in bringing a nuisance claim.

334. ENV’T PROT. AGENCY, EPA 823R18004, EPA’S PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) ACTION PLAN (2019), https://www.epa.gov/sites/default/files/2019-02/documents/pfas_action_plan_021319_508compliant_1.pdf [<https://perma.cc/Y386-ZSBF>].

335. *Id.*

336. ENV’T PROT. AGENCY, EPA-100-K-21-002, PFAS STRATEGIC ROADMAP: EPA’S COMMITMENTS TO ACTION 2021–2024 (2021), https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf [<https://perma.cc/X7AP-VGKX>].

Additionally, the waste principle may support a claim under the public-trust doctrine against the state water administrator for permitting the polluter to use a common aquifer in a wasteful manner.

D. Waste's Proper Role

Despite its numerous potential contributions, the waste principle is not a panacea for contemporary environmental and commons-management problems. Even though waste skews toward future interests, as a common law doctrine, its mechanism is gradual and incremental. Moreover, waste doctrine only prevents subtractive harms; it does not impose a duty to improve property. As a result, waste alone may not keep up with disruptive and rapidly compounding challenges like climate change. Although norms may evolve and courts and agencies may eventually update waste to consider resource-scale impacts—such as climate change, species extinction, and aquifer depletion—it may come too late to avoid serious degradation. Consequently, just as historic-preservation laws supplement common law limitations on destruction of property to protect the public interests of non-owners, waste should be viewed as operating in conjunction with, rather than as an alternative to, the essential constraints on uses of common property within modern environmental laws. In formulating such statutory and regulatory provisions, drafters would be wise to adopt an approach consistent with the adaptive, flexible framework provided by the waste principle, which is already utilized in many existing oil and gas conservation acts and water codes.³³⁷ Conversely, where agencies and legislatures are unresponsive to emerging and escalating environment problems, courts should enthusiastically reengage with the doctrine of waste to remedy and prevent subtractive harms.

Important though it is, centralized regulation ought to be a last resort in governing commons problems, to be utilized only where decentralized judicial enforcement of the common law of waste is not practicable. Yet waste doctrines are largely underenforced, although this Article details many examples where courts enforced the common law of waste to prevent subtractive

337. See *supra* Sections III.A.2 & III.B.2.

uses of common property.³³⁸ Understanding the waste principle as an inherent limitation on title to commonly held property, as well as an integral component of a longstanding system of decentralized liberal governance of shared resources, may reassure lawyers and judges otherwise reticent to employ a seemingly obscure or ancient doctrine. In any case, more consistent use of the waste principle by lawyers and judges is needed to effectuate a simpler and more liberal system of regulation of public and private property.

CONCLUSION

Far from an obscure artifact of first-year property class, waste law, when properly understood, forms a vital part of a forward-looking, decentralized, durable, and adaptive framework for integrating public and private interests in commons resources. The waste principle offers a fresh perspective on leading theories of property law, as well as an antidote to contemporary resource-scale environmental problems. As such, environmental scholars and advocates should embrace waste doctrines as the embodiment of the waste principle, which is inextricable from environmental governance. Likewise, courts ought to seek to consistently enforce the waste principle as an inherent limitation on title to common property, and legislators should respect the principle as a foundational component of a simple, liberal, and pragmatic system when evaluating and drafting statutory changes to the common law.

338. See generally Neuman, *supra* note 116 (comprehensively critiquing the failure of enforcement of the beneficial-use doctrine, embodying the waste principle, in western water law).