THE "BACKGROUND PRINCIPLES" OF NATURAL CAPITAL AND ECOSYSTEM SERVICES—DID *LUCAS* OPEN PANDORA'S BOX?

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I. INTRODUCTION

> *"When . . . a regulation . . . goes beyond what the relevant background principles would dictate, compensation must be paid to sustain it"*[1]

What are the "relevant background principles" of natural capital and ecosystem services?[2] Although there is much yet to be learned about the ecology, geography, and economy of natural capi-

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1. Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1030 (1992).

2. I am assuming readers have a working background understanding of the concepts of natural capital and ecosystem services. Briefly, ecosystem service, also known as environmental services, are non-commodity, economically valuable benefits humans derive from ecological resources directly, such as storm surge mitigation provided by coastal dunes and marshes, and indirectly, such as nutrient cycling that supports crop production. Natural capital consists of the ecological resources that produce these service values, such as forests, riparian habitat, and wetlands. Other articles in this symposium issue provide examples of natural capital and ecosystem services in specific ecological contexts. The primary aim of my contribution is to examine how the common law treats natural capital and ecosystem services in general. Portions of this work also appear in a more extensive examination of the status and future of natural capital and ecosystem services in law, J.B. RUHL, STEVEN KRAFT & CHRISTOPHER LANT, THE LAW AND POLICY OF ECOSYSTEM SERVICES (2007).

tal and ecosystem services, what is already known demands attention from the discipline of the law. Notwithstanding all the complications revealed through those other fields of study, in many cases the underlying ecosystem processes are well understood, the service can be traced from its natural capital source to its human beneficiaries, and we know the service is valuable to those people. So the obvious question is, what can be done to better integrate natural capital and ecosystem service values into land use and resource management decisions? As a starting point, one should know the baseline of common law doctrine from which any evolution of the law, whether it be judicially or legislatively initiated, is launching.

That is the purpose of this Article—to provide a general sense of where the common law sits today with respect to natural capital and ecosystem services. Part II explores two views of that landscape—one gloomy and the other hopeful. The gloomy view draws heavily from Professor John Sprankling's profoundly insightful article, *The Antiwilderness Bias of American Property Law*.[3] Although it has been largely overlooked in the literature on environmental law, Sprankling's careful documentation of how American common law systematically subverted incentives to conserve wilderness has recently enjoyed newfound attention by scholars interested in the development of the next phase of environmental common law.[4] Clearly, though, Sprankling's message for my purposes is that the common law has resisted integration of concepts like natural capital and ecosystem service values. The antiwilderness bias of the common law, in other words, erects antiecosystem background principles for natural capital and ecosystem services.

The more hopeful view painted in Part II draws heavily from work by Professor Michael Blumm exploring the implications of Justice Scalia's suggestion, made in his majority opinion in *Lucas v. South Carolina Coastal Council*,[5] that the background principles of the common law of property and nuisance can evolve.[6] On the one hand, the opinion is most noted for its proposition, quoted as

3. John G. Sprankling, *The Antiwilderness Bias of American Property Law*, 63 U. CHI. L. REV. 519 (1996).

4. *See, e.g.*, Craig Anthony Arnold, *The Reconstitution of Property: Property as a Web of Interests*, 26 HARV. ENVTL. L. REV. 281, 320-321 (2002); Lee P. Breckenridge, *Can Fish Own Water?: Envisioning Nonhuman Property in Ecosystems*, 20 J. LAND USE & ENVTL. L. 293, 305 (2005); Alexandra B. Klass, *Adverse Possession and Conservation: Expanding Traditional Notions of Use and Possession*, 77 U. COLO. L. REV. 283, 330-32 (2006).

5. 505 U.S. 1003 (1992).

6. *See* Michael C. Blumm & Lucas Ritchie, Lucas's *Unlikely Legacy: The Rise of Background Principles as Categorical Takings Defenses*, 29 HARV. ENVTL. L. REV. 321 (2005).

the opening of this Article, that "when . . . a regulation . . . goes beyond what the relevant background principles would dictate, compensation must be paid to sustain it."[7] On the other hand, what interests Blumm, and me, is Justice Scalia's observation that "changed circumstances or new knowledge may make what was previously permissible [under common law] no longer so."[8] The background principles, in other words, can evolve.

Recognizing that many people believe this evolution should be based on scientific, moral, and ethical arguments on behalf of ecological protection, I take a more instrumentalist—and I think realistic—approach based in welfare economics and the economic value of ecosystem services.[9] My thesis is that the rapidly amassing

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7. *Lucas*, 505 U.S. at 1030.
8. *Id.* at 1031.
9. Jim Chen has objected that:

> [T]he instrumentalist view inherent in the ecosystem services concept dictates that the "chemical, physical, and biological" integrity of basic environmental media such as water not be viewed as an objective for its own sake, but rather as the crucial first step toward achieving human goals such as "propagation of fish" and "recreation in and on the water."

Jim Chen, *Webs of Life: Biodiversity Conservation as a Species of Information Policy*, 89 IOWA L. REV. 495, 548 (2004) (citing 33 U.S.C. § 1251(a)(2) (2000)). The environmental philosopher Mark Sagoff has more vehemently dismissed focusing on ecosystem services as excessively instrumentalist. *See* MARK SAGOFF, PRICE, PRINCIPLE, AND THE ENVIRONMENT (2004). Integrating ecosystem service values into environmental decision making, however, does not preclude considering scientific, moral, and ethical factors as well. Moreover, given the reasons for the anti-ecosystem bias in property doctrine, it seems more likely that courts will respond to instrumentalist arguments regarding why the bias is misguided than they will to moral and ethical arguments. To put it more bluntly, the moral and ethical arguments have only moved the ball so far, and clearly not far enough, so it seems counterproductive to refuse to consider instrumentalist arguments that focus attention of the courts on the raw economic value to humans of natural capital and the provision of ecosystem services. It is not as if ecosystem services would not exist but for the efforts of economists and ecologists examining their economic potential. They have measurable value to humans, and whether we know their precise economic value or not, the fact that society has to choose how to allocate natural resources necessarily requires valuation of ecosystem services in some form or another. Failure to refine our understanding of their value, and the consequent inability to account for those values in regulatory and market settings and, more importantly, in the public mind, is unlikely to promote their conservation. As David Pearce has put it:

> [T]he playing field is not level; rather, it is tilted sharply in favor of economic development. Two things have to be done to correct this situation. First, one has to show that ecosystems have economic value—indeed, that all ecological services are economic services. Second, a way has to be found to "capture" the nonmarket values of ecosystems and turn them into real benefits for those who practice conservation.

David Pearce, Commentary, *Auditing the Earth: The Value of the World's Ecosystem Services and Natural Capital*, 40 ENVIRONMENT 23, 23 (1998). Robert Costanza et al. make the point more succinctly in urging that "although ecosystem valuation is certainly difficult and fraught with uncertainties, one choice we do not have is whether or not to do it." Robert

knowledge about the value of natural capital and ecosystem services can and should trigger a shift in the common law's baseline by disrupting the instrumentalist premises on which the anti-ecosystem bias of the common law rests.[10]

Part III of the Article assembles evidence that this effect is already afoot. With increasing frequency, albeit still in low numbers, courts are recognizing the economic value of natural capital and ecosystem services as relevant to outcomes under public nuisance claims and the public trust doctrine. What is remarkable about these cases is the ease and nonchalance with which the courts do so. It takes no revolutionary vision of the common law to find that the destruction of *economically* important natural resources should factor into the common law's decision calculus. Rather, this trend is simply the natural evolution of the common law motivated by new knowledge about nature's economic value.

It is too early to tell how significant the trend will be. The number of cases following it is not large, and the context of natural capital and ecosystem services presents many complex issues for courts. But new ideas and approaches in the common law have a way of spreading, usually slowly, but sometimes with remarkable speed and pervasive results.[11] For the moment, therefore, I feel safe in my conclusion that the cracks appearing in the common law's anti-ecosystem floor suggest some upheaval at deeper foundations could be at work. *Lucas* may indeed have opened Pandora's box.

II. MOVING THE BASELINE WITH THE "NEW KNOWLEDGE" PRINCIPLE

This Article is part of a larger project exploring how to integrate natural capital and ecosystem service values into the common law. Step one in that project is to define the baseline from which I am working. Step two, given how bleak the answer is to step one, is to find a way to move the baseline.

Costanza et al., *The Value of the World's Ecosystems and Natural Capital*, 387 NATURE 253, 255 (1997).

10. I have suggested, but not fully developed, this thesis in previous work. *See* J.B. Ruhl, *Toward a Common Law of Ecosystem Services*, 18 ST. THOMAS L. REV. 1 (2005); J.B. Ruhl, *Ecosystem Services and the Common Law of "The Fragile Land System,"* 20 NAT. RESOURCES & ENV'T 2, 3 (2005).

11. *See, e.g.*, Jeff L. Lewin, *The Genesis and Evolution of Legal Uncertainty About "Reasonable Medical Certainty,"* 57 MD. L. REV. 380 (1998) (tracing the spread of the "reasonable medical certainty" doctrine in the common law).

A. The Common Law's Anti-Ecosystem Baseline

As Sprankling observes, American property law has traditionally been portrayed as silent or neutral on the question of what rights or duties a landowner has over undeveloped land on which wilderness is located.[12] This "neutrality paradigm," as he calls it, supported the premise that property law neither encourages nor discourages property owners from destroying or degrading natural capital, meaning that the decision whether to do so must be seen as a voluntary act driven by rational economic behavior.[13] Indeed, were this the case, it would be encouraging to the project of defining rights in natural capital and ecosystem services, for it would mean that the law would be improving the clarity of rights rather than reorienting settled principles.

But a careful reading of the evolution of American property law from its English common law roots to its contemporary framework suggests it is not gaps that must be filled, but walls that first must be taken down. Indeed, Sprankling convincingly demonstrates why American property law is anything but unclear about a landowner's discretion over the fate of natural capital and ecosystem services. His thorough historical analysis reveals that early American property law, as formulated through judicial opinions building the common law of property rights, embraced agrarian development as its central purpose and saw the nation's abundance of wilderness as essentially a license to tilt property law toward what he calls an "antiwilderness bias."[14] It was "an instrumentalist judiciary [that] modified English property law to encourage the agrarian development, and thus destruction, of privately owned American wilderness,"[15] and this was perceived as having no downside given the supply of undeveloped land the nation enjoyed. No less than the United States Supreme Court joined in this retooling of common law, as Justice Story observed in 1829 that "[t]he country was a wilderness, and the universal policy was to procure its cultivation and improvement."[16] The result was a body of law that actually *encouraged* destruction of wilderness and devalued its status in the market.

In one of his most striking examples, Sprankling traces the evolution of American property law on the doctrine of adverse possession, under which the long-term possessor of land can oust the

12. *See* Sprankling, *supra* note 3, at 520.
13. *Id.*
14. *Id.*
15. *Id.* at 521.
16. Van Ness v. Pacard, 27 U.S. (2 Pet.) 137, 145 (1829).

true title owner of possession.[17] The doctrine was a means of resolving title disputes in England, which lacked an organized title recording system, in the context of what was a densely agrarian landscape long before the development of American law. English common law, which early American courts adopted wholesale, required the adverse claimant, among other things, to have engaged in open and obvious activities likely to afford notice to a diligent owner, such as establishing residence on the land, cultivating it, or fencing in portions.[18] Over time, however, American courts began systematically to promote development by modifying these requirements based on the nature of the land involved. Thus, adverse possession of wilderness lands could successfully be established by infrequent, inconspicuous acts, such as occasional berry picking or taking of timber, that would likely have gone unnoticed by anyone, even an observant and diligent owner.[19] This made it easier to establish adverse possession of wilderness lands through minimal development activity, and thus sent a clear message to landowners to develop their land first lest they lose it to interlopers.

Similarly, the common law doctrine of waste was enforced in England mainly to preserve the status quo between co-owners, "resolv[ing] disputes between competing interest holders by preferring existing uses to new uses."[20] Particularly given England's wood-dependent economy and wood-scarce landscape, any substantial cutting of trees on forested land was considered waste, allowing the objecting co-owner to prevent his or her co-owners from doing so. In the early American context, the situation was quite the reverse—the landscape was tree-abundant and farm-scarce. The English version of waste would have impeded agricultural development, and thus the American courts soon deemed that "[l]ands in general with us are enhanced by being cleared" and that it would "be an outrage on common sense" to apply the English doctrine.[21] This sentiment eventually forged the American "good husbandry" standard of waste, which permitted a co-owner to clear wilderness land for cultivation or grazing without fear of being found to have committed waste.[22] Sprankling surveys more recent case law to demonstrate that, while the number of cases decided pursuant to the common law doctrine has diminished considerably

17. Sprankling, *supra* note 3, at 538-39.
18. *Id.* at 538.
19. *Id.* at 539.
20. *Id. at* 534.
21. Hastings v. Cruncklеton, 3 Yeates 261, 262 (Pa. 1801).
22. Sprankling, *supra* note 3, at 535.

(likely because most co-owners today act through formal governing agreements), the courts remain committed to this approach, leaving "the modern law of waste . . . staunchly hostile to wilderness."[23]

Even the law of nuisance, the common law doctrine most attuned to the relationship between property owners, joined in the evolution of the anti-wilderness bias. As Sprankling explains, English common law enforced a strict harm-based test for nuisance, under which any act that harmed the productive usefulness of other land could be deemed a nuisance.[24] In America, however, the pro-development common law evolved so that the "reasonableness" of the harm mattered, and locality and circumstances became the criteria with which to measure what was reasonable.[25] The result was that "[a]ll other things being equal, conduct was less likely to be enjoined as a nuisance if it occurred in a wilderness area than in another, more developed, locality."[26] One court, for example, went so far as to refuse to enjoin a dam that would have flooded a tract "so wet, marshy and sour as to be worthless for agricultural . . . purposes."[27] Of course, as nuisance law systematically made it less likely a court would find harmful land uses a nuisance in wilderness areas than in developed areas, potential nuisance-causing land uses gravitated to undeveloped areas to reduce their exposure to liability.[28]

As one might expect, the American West was where Sprankling found the anti-wilderness bias has penetrated deepest into property law. Because of England's dense crop and pasture land uses, English common law held to rigid lines on the doctrine of trespass, making stock owners liable for any damage their animals might cause to other landowners.[29] By contrast, American law, particularly in the West, tore down the "invisible fence" of English trespass law and replaced it with a "free-range" standard under which stock could roam over private lands without creating trespass liability.[30] By statute, many American states purported to reverse the English rule so as to facilitate agrarian development.[31] Locat-

23. *Id.* at 569.
24. *Id.* at 553.
25. *Id.* at 554.
26. *Id.*
27. McNeal v. Assiscunk Creek Meadow Co., 37 N.J. Eq. 204, 204 (1883). For a comprehensive history of the English common law regarding wetlands, focusing on the many ways in which the law contributed to a sustainable wetlands ecology, see Fred P. Bosselman, *Limitations Inherent in the Title to Wetlands at Common Law*, 15 STAN. ENVTL. L.J. 247 (1996).
28. Sprankling, *supra* note 3, at 556.
29. *Id.* at 549-50.
30. *Id.* at 550.
31. *Id.*

ing livestock near forested land or the prairie thus became viewed as a beneficial use of the adjoining natural resources. Although courts in New England states construed these statutes quite narrowly, elsewhere they prevailed under theories that the free-range standard had become the common law equivalent of "customary use" of undeveloped lands, in effect making privately owned wilderness open access land for purposes of grazing.[32] As the Ohio Supreme Court put it, "to leave uncultivated lands uninclosed [sic], was an implied license to cattle and other stock at large to traverse and graze them."[33]

Sprankling's assessment of American property law thus reveals why accounting for natural capital and ecosystem services in property law will involve more than simply clarifying property rights, as if the rules and liabilities are not already clear. Rather, it seems perfectly clear that owning undeveloped land, which is where one would reasonably expect to find intact natural capital, is a *burden* to landowners under American property law. On balance, a landowner is better off developing natural capital to other uses, lest ownership be lost to an adverse possessor, lest co-owners get to it first, lest nuisance uses locate in the vicinity for safe harbor from liability, lest stock owners graze their cattle there, and so on. The goal of recognizing natural capital as an economically valuable asset can only be hindered under this entrenched common law cloud.

Of course, today it would be unusual for a judge to characterize a wetland as a worthless tract of sour marsh. Modern understanding of the ecological function of wetlands has raised them from wasteland status to an important public resource. For example, in upholding federal regulation of development in wetlands the United States Supreme Court acknowledged that "wetlands may serve to filter and purify water draining into adjacent bodies of water . . . and to slow the flow of surface runoff into lakes, rivers, and streams and thus prevent flooding and erosion . . . ."[34] But this change of heart has largely been embodied through public legislation with its focus on the use of public lands or the protection of discrete resources on public and private lands. Notwithstanding the changes in public perception and the rise of public legislation aimed at protecting the environment, Sprankling found that the

32. *Id.* at 551.

33. Kerwhaker v. Cleveland, Columbus & Cincinnati R.R. Co., 3 Ohio St. 172, 179 (1854).

34. United States v. Riverside Bayview Homes, Inc., 474 U.S. 121, 134 (1985). Other cases in which courts assign similar value to wetlands are discussed in Blumm and Ritchie, *supra* note 6, at 337.

contemporary common law of property has remained stuck in its nineteenth century antiwilderness bias. His conclusion:

> Modern courts have lost sight of the historical roots of our property law system. Although espousing prowilderness sentiments in good faith, the judiciary blindly applies most of the antiwilderness doctrines of the past. Thus, individual disputes tend to be resolved in favor of wilderness exploitation. More importantly, the historic body of antiwilderness opinions continues to exist, setting public norms for private conduct outside of the litigation arena. The accumulated precedents of the two centuries constitute a virtual common law of wilderness destruction that threatens the existence of privately owned wilderness sanctuaries.[35]

While Sprankling couches this phenomenon on the effect the common law's bias has on conservation of wilderness, the importance of undisturbed wild lands to the sustainability of dynamic ecosystems surely demands that the bias be reframed as one of "anti-ecosystem" dimensions. And as the productivity of natural capital and delivery of ecosystem services depend on the sustainability of ecosystems, the common law's bias strikes at the heart of the goal of accounting for natural capital and ecosystem services in property rights, as well as in law and policy generally.

Indeed, further evidence supporting Sprankling's dim evaluation of the fate of natural capital under American property law is found in the absence of precedent for the proposition that landowners have rights in the continued flow of ecosystem services from other person's lands. After all, such rights, if they were recognized and enforced, would be the antithesis of any notion that property law favors the development of natural capital. If Sprankling were wrong about the anti-ecosystem bias of the common law, therefore, one could reasonably expect to find precedent supporting a landowner's right inherent in title—that is, without formal contractual agreement, regulatory intervention, or claim resolved under nuisance law—to some level of continued provision of ecosystem services flowing from natural capital found on another's land. At the very least, under the assumption that such rights are presently unclear, one should expect to find the law silent on the matter. In fact, however, the property law of ecosystem services is the

35. Sprankling, *supra* note 3, at 569.

mirror image of the property law of natural capital—the common law is clear that there are no such rights inherent in title to land.

In this sense English and American common law are much closer in unison than is the case for the common law of natural capital. Strictly speaking, the kind of right that would require one landowner to refrain from interfering with the flow of ecosystem services to other lands is referred to as a negative easement.[36] The English common law recognized four negative easements inherent in title: the rights to stop other landowners from (1) blocking one's windows, (2) interfering with the flow of air in a defined channel, (3) removing artificial support for buildings, and (4) interfering with the flow of water in an artificial channel.[37] Also, under the doctrine of "ancient lights," if a landowner received light from across adjacent parcels for a sufficient period of time, a negative easement could arise by prescription.[38] But English courts, cautious in general of attaching too many encumbrances to land, stopped there in establishing any more expansive negative easements as a matter of title.[39] American courts accepted all of those doctrines but the ancient lights doctrine, which has been disavowed repeatedly in this country,[40] and stopped there except for adding the widely recognized doctrine that landowners must provide the lateral and subjacent support that an adjacent parcel would receive under natural conditions, imposing a general duty on landowners not to cause subsidence on other properties through excavation of soil or withdrawal of groundwater.[41] Beyond this limited set of negative rights American property law ventured no further.

Even in the absence of such rights, nuisance law might have developed so as to mediate competing claims of reasonable use in favor of continued enjoyment of ecosystem services. Indeed, American legal scholars many decades ago suggested that a set of "natural rights" should guide nuisance law to protect a landowner's use of land in its natural condition, with one boldly claiming that "[o]wnership of land insures far more than mere occupa-

36. *See* JESSE DUKEMINIER ET AL., PROPERTY 736-38 (6th ed. 2006).

37. *Id.* at 736.

38. *Id.* at 737 n.26.

39. *Id.* at 736.

40. For a famous example, see Fontainebleu Hotel Corp. v. Forty-Five Twenty-Five, Inc., 114 So. 2d 357, 359 (Fla. 3d DCA 1959) (noting that the English doctrine "has been unanimously repudiated in this country").

41. *See* DUKEMINIER ET AL., *supra* note 36, at 645-46. To be sure, American courts have been more generous than their English counterparts in recognizing the creation of negative easements *by agreement.* Land trusts routinely employ that mechanism to purchase (and not use) rights to develop land, leaving title and limited use rights in the seller. *See id.* at 738-40.

tion and use of soil and vegetation on the surface of the earth. It protects the reasonable use of all the elements nature places on the surface."[42] To date, however, few published judicial opinions have picked up on that thesis. One court in Texas found that cloud seeding unreasonably interfered with natural rainfall on the plaintiff's property, holding that a "landowner is entitled . . . to such rainfall as may come from clouds over his own property that Nature, in her caprice, may provide."[43] In a more modern context, the Wisconsin Supreme Court found that interfering with the flow of light to solar panels could give rise to a nuisance claim given that "[a]ccess to sunlight as an energy source is of significance both to the landowner who invests in solar collectors and to a society which has an interest in developing alternative sources of energy."[44] Yet these are rare exceptions, not the general rule. Nuisance doctrine, while not flatly rejecting the idea that loss of ecosystem services could give rise to an actionable claim, has been in no hurry to embrace it either.

As it stands today, therefore, American property law is not simply neutral on the question of private property rights in natural capital and ecosystem services, but downright hostile to them, making it no wonder that neither finds much stock in the marketplace. The private landowner in such a system has no reason to think that conserving natural capital will be to his or her advantage; indeed, doing so may be a disadvantage. Likewise, the beneficiaries of ecosystem services flowing from natural capital on other person's lands have no expectation based on our common law experience that they may protect those benefits through enforcement of property rights. Neither condition is the result of private property rights being "poorly defined." Rather, in the absence of intervening public legislation, we have been handed a clear set of rules from our common law system of property rights—landowners have almost total discretion over natural capital on land they own, with strong incentives to destroy it, and they have no inherent rights in the continued provision of ecosystem services from land owned by others. There is no gap in private property rights to be filled, in other words, but rather a well-constructed wall to be taken down.

42. Note, *Who Owns the Clouds?*, 1 STAN. L. REV. 43, 53 (1948).

43. Southwest Weather Research, Inc. v. Rounsaville, 320 S.W. 2d 211, 216 (Tex. Civ. App. 1958).

44. Prah v. Maretti, 321 N.W. 2d 182, 189 (Wis. 1982).

B. Integrating New Knowledge of Natural Capital and Ecosystem Services

Sprankling's account of the evolution of the common law of property rights, confirmed in other historical studies,[45] finds unmitigated support in the unlikely field of regulatory takings law. The tenacity of the common law's drift toward the anti-ecosystem bias meant that any meaningful protection of natural resources on private lands would have to come through private volunteerism and public legislation. Although many sporadic instances of conservation legislation happened in the states simultaneously with the common law's evolution in the opposite direction,[46] no one could reasonably argue that a comprehensive body of statutory public law existed, even by the mid-1900s, to reverse the anti-ecosystem bias of the common law. The wave of federal environmental legislation beginning in 1970[47] did include laws with substantial impact on private land use, most notably the Endangered Species Act[48] and the regulation of wetlands that has grown out of Section 404 of the Clean Water Act.[49] But as that body of land use regulation expanded, the claim grew ever louder that its effect cut so hard against the grain of settled common law property rights as to constitute a taking of property without just compensation in contravention of the Fifth Amendment to the Constitution.[50]

Ironically, although this so-called "regulatory takings" tension has not resulted in many successful litigation claims seeking compensation, it led eventually to a legal development that placed the pro-development common law in the role of gatekeeper for the validity of pro-environment legislation. As noted previously, in his opinion for the majority in *Lucas*, Justice Scalia announced that where a new land use regulation denies all economically beneficial or productive use of land—in that case a blanket prohibition of development in coastal dune areas—it must be treated as a *per se* taking of property for which just compensation is due under the Fifth Amendment.[51] Justice Scalia's caveat was that just compensation would not be due if the regulation does "no more than

45. *See* Klass, *supra* note 4; Steven J. Eagle, *Environmental Amenities, Private Property, and Public Policy*, 44 NAT. RESOURCES J. 425 (2004); James M. McElfish, *Property Rights, Property Roots: Rediscovering the Basis for Legal Protection of the Environment*, 24 ENVTL. L. REP. (Envtl. L. Inst.) 10231 (1994).

46. McElfish, *supra* note 45.

47. RICHARD J. LAZARUS, THE MAKING OF ENVIRONMENTAL LAW 67-97 (2004).

48. 16 U.S.C. §§ 1531-1544.

49. 33 U.S.C. § 1344.

50. LAZARUS, *supra* note 47, at 126-37.

51. *Lucas*, 505 U.S. at 1028-32.

[simply] duplicate the result that could have been achieved in the courts—by adjacent landowners (or other uniquely affected persons) under the State's law of private nuisance, or by the State under its complementary power to abate nuisances that affect the public generally . . . ."[52] In his concurring opinion, Justice Kennedy expressed concern with the idea that state regulation could go no further than duplicating the common law of nuisance without exposing itself to the now infamous "categorical taking" problem, for as he put it, "[c]oastal property may present such unique concerns for a fragile land system that the State can go further in regulating its development and use than the common law of nuisance might otherwise permit."[53] In other words, Justice Kennedy took it as a given, as Justice Scalia and the majority also clearly did, that the common law of property does not protect the "fragile land system." Indeed, although leaving the final say to state courts, Justice Scalia surmised that "[i]t seems unlikely that common-law principles would have prevented the erection of any habitable or productive improvements on petitioner's land . . . ."[54]

In an effort to turn Justice Scalia's caveat into the exception that swallows the rule, many legal scholars have rediscovered the importance of the common law of property rights in the constellation of environmental law, not as a constraint, but rather as a liberator. For example, in *Lucas's Unlikely Legacy: The Rise of Background Principles and Categorical Takings Defenses*, Professor Michael Blumm and co-author Lucas Ritchie offer a comprehensive survey of common law doctrines that could, in some cases in their existing forms and in others only through some evolutionary judicial development, impose restrictions on the ability of a landowner to destroy natural capital and thus insulate public regulation that duplicates that effect from attack as a regulatory taking of property.[55] Most of the doctrines they examine, which include the public trust doctrine,[56] the natural use doctrine,[57] the federal navigation servitude,[58] water rights,[59] and the wildlife trust,[60] relate to common law formulations of ostensibly superior *public* rights in resources, and the authors' focus is on defending public regulation

52. *Id.* at 1029.
53. *Id.* at 1035 (emphasis added).
54. *Id.* at 1031 (citing Curtin v. Benson, 222 U.S. 78, 86 (1911)).
55. *See* Blumm & Ritchie, *supra* note 6.
56. *Id.* at 341-44.
57. *Id.* at 344-46.
58. *Id.* at 346-47. Although not a principle of state common law, the *Lucas* majority pointed to the federal navigation servitude as an example of background principles. *See Lucas*, 505 U.S. at 1027.
59. Blumm & Ritchie, *supra* note 6, at 350-52.
60. *Id.* at 352-53.

of private land from regulatory takings claims, not on adjusting or redefining rights as between *private* property owners.[61] Even within that limited scope, moreover, Blumm and Ritchie do not suggest that the anti-ecosystem bias of the common law has been substantially softened, much less reversed altogether. For example, in support of their thesis they point to the famous case of *Just v. Marinette County*,[62] in which the Wisconsin Supreme Court held that "[a]n owner of land has no absolute and unlimited right to change the essential natural character of his land so as to use it for a purpose for which it was unsuited in its natural state and which injures the rights of others."[63] Although they maintain that this "natural use doctrine" has firm roots in English common law and has been adopted by a few other American state courts,[64] at best its contours remain hazy and its development nascent. In short, notwithstanding their considerable efforts to uncover property doctrine exceptions to Sprankling's thesis, examples remain few and far between. More significantly, even their most promising candidates fail to use natural capital and ecosystem service values as an explicit basis for the departure.[65]

But recall Justice Scalia's observation that "changed circumstances or new knowledge may make what was previously permissible no longer so."[66] Many property law scholars take this to mean that the background principles for purposes of government takings liability evolve dynamically with the changing contexts of appropriate land uses and property rights.[67] Property law, in other words, adjusts to new knowledge—for example, about natural capital and ecosystem services—by arriving at new configurations of the relative balance of rights within the property system,

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61. For a similar focus, see Robert L. Glicksman, *Making a Nuisance of Takings Law*, 3 WASH. U. J.L. & POL'Y 149, 169-82 (2000).

62. Just v. Marinette County, 201 N.W. 2d 761 (Wis. 1972).

63. *Id.* at 768.

64. Blumm & Ritchie, *supra* note 6, at 345.

65. Granted that courts might act consistent with integration of natural capital and ecosystem service values without mentioning those words, it is nonetheless remarkable that so few courts even connect ecosystems with common law doctrine. In a search of the ALL-STATES Westlaw database, I found only seven pre-2000 cases mentioning the terms "public trust doctrine" and "ecosystem," and in none of the cases did the terms appear in the same paragraph. Similarly, I found only eight cases mentioning "public nuisance" and "ecosystem," only one of which mentioned them in the same paragraph. In none of either set of cases did the courts use the terms in a way consistent with any sense of softening of the anti-ecosystem bias.

66. *Lucas*, 505 U.S. at 1031.

67. *See*, e.g., Richard J. Lazarus, *Putting the Correct "Spin" on Lucas*, 45 STAN. L. REV. 1411, 1419 (1993); Glenn P. Sugameli, *Lucas v. South Carolina Coastal Council: The Categorical and Other "Exceptions" to Liability for Fifth Amendment Takings of Private Property Far Outweigh the "Rule,"* 29 ENVTL. L. 939, 971 (1999).

and the "background principles" relevant to *Lucas* shift in synch.[68]

Although some legal scholars do not agree Justice Scalia meant to leave this door open or that going through it would be wise,[69] state and lower federal courts have begun to take up Justice Scalia's invitation. For example, in *Machipongo Land & Coal Co. v. Commonwealth*,[70] the Pennsylvania Supreme Court rejected a regulatory takings claim coal owners brought in connection with a state agency's decision to designate their properties as unsuitable for surface mining. The basis for the designation was the finding that mining coal in the area, which was the watershed of a stream that was a source of drinking water, "'would adversely affect the use of the stream as an auxiliary water supply' and . . . 'disrupt the hydrological balance causing decreases in the net alkalinity of discharges . . . .'"[71] Surface mining of coal, of course, has a long history in Pennsylvania, even in watersheds of streams, but the court nonetheless determined that it would constitute a public nuisance in this case. As the court observed:

> The rules and understandings as to the uses of land that are acceptable and unacceptable have changed over time. The fact that sewage was once strewn into city streets does not give rise to a permanent reasonable expectation that such behavior can continue indefinitely . . . . While the owner of land might once have been permitted to mine his land without regard to the effect that it had on public streams, as evidenced by the spoilage of "11,000

68. This is a long and widely held conception of the common law. For example, in support of the proposition Justice Scalia pointed to the Restatement (Second) of Torts, which explains with respect to nuisance claims that:

> The character of a particular locality is, of course, subject to change over a period of time and therefore the suitability of a particular use of land to the locality will also vary with the passage of time. A use of land ideally suited to the character of a particular locality at a particular time may be wholly unsuited to that locality twenty years later. Hence the suitability of the particular use or enjoyment invaded must be determined as of the time of the invasion rather than the time when the use or enjoyment began.

RESTATEMENT (SECOND) OF TORTS § 828 cmt. g (1979). In short, "the specific harms that nuisance governs are neither fixed nor objective. Rather, what nuisance law treats as a harm is highly contextual and determined by community norms." Albert C. Lin, *The Unifying Role of Harm in Environmental Law*, 2006 WIS. L. REV. 897, 904 (2006).

69. *See, e.g.*, David L. Callies, *Custom and Public Trust: Background Principles of State Property Law?*, 30 ENVTL. L. REP. (Envtl. L. Inst.) 10003 (2000).

70. Machipango Land & Coal Co. v. Commonwealth, 799 A.2d 751 (Pa. 2002).

71. *Id.* at 757 (quoting Machipongo Land & Coal Co., Inc. v. Commonwealth, No. 248 M.D.1992, slip op. at 3 (Pa.Cmwlth. 2000).

> miles of streams" in this country, that expectation is, and has been for some time, no longer reasonable. Despite the fact that one may have purchased property with the expectation to use it in such a manner that was acceptable before the purchase, there may come a point in time when the original owner's expectations may no longer be reasonable.[72]

Shutting off the flow of ecosystem services from one's property to others may also, in many contexts, have long been acceptable, but just as with sewage strewn into streets and acid runoff from mines, there is no permanent reasonable expectation that such behavior can continue indefinitely. Part III examines two cases, one arising in the context of a public nuisance and the other under the public trust doctrine, suggesting that such behavior may indeed be becoming unacceptable in the eyes of the common law.

III. EVIDENCE OF EVOLUTION

Although the new knowledge principle works throughout the full breadth of the common law, it does so, usually, as part of the ordinary co-evolution of law and society. As Blumm and Ritchie suggest, however, the way in which the new knowledge principle arises in *Lucas* says nothing less than "bring it on" to government and environmental interest group attorneys intent on containing the scope of categorical takings. The problem, as Sprankling's work drives home, is that the common law has had little interest in new knowledge about the environment *qua* environment. The smattering of cases Blumm and Ritchie identify hardly amounts to a shift of tides against the common law's anti-ecosystem bias. By contrast, when the environment can be linked to utilitarian costs and benefits, which is precisely what the burgeoning research on natural capital and ecosystem services is revealing about ecological resources, the common law is more likely to pay attention. The cases are not numerous by any means, but there is evidence that this theme is being picked up in the law of public nuisance and of the public trust doctrine.

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72. *Id.* at 772-73 (quoting Mugler v. Kansas, 123 U.S. 623, 669 (1887). This is the generally held conception of nuisance doctrine—i.e., that "the specific harms that nuisance governs are neither fixed nor objective. Rather, what nuisance law treats as a harm is highly contextual and determined by community norms." Albert C. Lin, *The Unifying Role of Harm in Environmental Law*, 2006 WIS. L. REV. 897, 904 (2006).

A. Public Nuisance

A public nuisance "is an unreasonable interference with a right common to the general public."[73] Rights common to the general public need not be rights in land;[74] indeed, rights in land held by numerous landowners do not necessarily amass into a right common to the general public.[75] Ecosystem service nuisances seem ready-made for public nuisance under all these conditions.

In *Palazzolo v. State*,[76] for example the Rhode Island trial court considered a regulatory takings claim the United States Supreme Court had left dangling in *Palazzolo v. Rhode Island*.[77] The Supreme Court rejected the plaintiff's claim that state agency denial of a permit to fill and develop a marsh area adjacent to a pond constituted a categorical taking of property under *Lucas*, because the agency allowed plaintiff to develop some of his parcel, and left it to the state courts initially to decide whether the permit denial was a regulatory taking. The state trial court reasoned that *Lucas* "establish[ed] public nuisance as a preclusive defense to takings claims,"[78] and found that "clear and convincing evidence demonstrates that Palazzolo's development would constitute a public nuisance"[79] on the following grounds:

> [P]alazzolo's proposed development has been shown to have significant and predictable negative effects on Winnapaug Pond and the adjacent salt water marsh. The State has presented evidence as to various effects that the development will have including increasing nitrogen levels in the pond, both by reason of the nitrogen produced by the attendant residential septic systems, and the reduced marsh area *which actually filters and cleans runoff.* This Court finds that the effects of increased nitrogen levels constitute a predictable (anticipatory) nuisance which would almost certainly result in an ecological disaster to the pond.[80]

Palazzolo thus involved the type of transboundary property

73. RESTATEMENT (SECOND) OF TORTS § 821B(1) (1979).
74. RESTATEMENT (SECOND) OF TORTS § 821B cmt. h (1979).
75. RESTATEMENT (SECOND) OF TORTS § 821B cmt. g (1979).
76. Palazzolo v. State, 2005 WL 1645974 (R.I. 2005).
77. 533 U.S. 606 (2001).
78. *Palazzolo*, 2005 WL 1645974 at *5.
79. *Id.*
80. *Id.* (emphasis added).

rights issue that is likely to be ubiquitous for the law and policy of natural capital and ecosystem services, and the case demonstrates the easy time public nuisance law has for integrating those values into a straightforward analysis: Palazzolo owned the marsh; the marsh filtered and cleaned runoff into the pond; those services were positive externalities flowing off of Palazzolo's property; the public in general enjoyed the benefits of that service; Palazzolo therefore had no property right to fill the marsh. It's that simple.[81]

Nevertheless, as easily as the court's decision integrated ecosystem services into public nuisance doctrine, the decision also illustrates the difficulty of making the same move in private nuisance doctrine and, perhaps to a lesser degree, when asserting public nuisance affirmatively rather than as a defense. The nuisance analysis arises in cases like *Palazzolo* only in connection with the government's assertion of the nuisance exception to the landowner's regulatory taking claim. If the government can establish the exception under the public nuisance branch simply by demonstrating the *qualitative* effect on ecosystem service delivery, it need not establish proof of *quantitative* harm to specific property owners. The government's litigation incentives thus are far different from those a private landowner or sovereign might advance against actions like Palazzolo's filling of the marsh.

In *Palazzolo*, for example, although the court acknowledged the "valuable filtering system" the marsh provided[82] and that the pond and marsh system provided "amenity value to ...the land owners in the area,"[83] the curtailment of ecosystem service values to private landowners did not register in the record or with the court. The court simply noted that "no neighboring landowner has made a private nuisance claim" and that the potential for obstruction of views of the water would not constitute a private nuisance under Rhode Island law.[84] It would have been unlikely, however, that any neighboring landowner would advance a private nuisance claim having to do with loss of the marsh filtering function before

81. Although not raising ecosystem services in connection with the "background principles" exception to regulatory takings, in another recent case a court referred to ecosystem services as one of the reciprocal benefits of environmental regulation that factor into the regulatory takings analysis and cut against a finding that the regulation has gone too far. *See* R & Y, Inc. v. Municipality of Anchorage, 34 P.3d 289, 298 (Alaska 2001) (pointing to "the unique ecological and economic value that wetlands provide in protecting water quality, regulating local hydrology, preventing flooding, and preventing erosion" and finding that regulations protecting such wetlands "provide ecological and economic value to the landowners whose surrounding commercially-developed land is directly and especially benefitted [sic] by the[ir] functioning.").

82. *Palazzolo*, 2005 WL 1645974 at *3.

83. *Id.*

84. *Id.* at *6.

it was known whether the state would grant the permit for the project, and that was even less likely after the state rejected the permit. In short, the law of ecosystem services in private nuisance claims, as well as for claims asserting public nuisance affirmatively rather than as a defense, is unlikely to develop in the context of regulatory takings claims—it will emerge only when private landowners and sovereigns start suing landowners over the effects of natural capital degradation. Nevertheless, the outcome under cases such as *Palazzolo* suggests that, with reliable evidence of significant injury resulting from curtailment of ecosystem services, such private and public nuisance actions may very well succeed. [85]

B. The Public Trust Doctrine

"The Public Trust Doctrine traces its roots to the Institutes of Justinian in Roman Law, which declared that there are three things common to all people: (1) air; (2) running water; and (3) the sea and its shores."[86] Along with the Romans, this principle invaded England and became part of its common law, which the states imported with minor variations after the American Revolution. While the British version held that tidelands were held by the King for the benefit of all English subjects, the American version replaced the crown with the states, and the courts became the doctrine's chief enforcer.

The scope of the trust imposed by the public trust doctrine can be thought of in several dimensions. First, it has a geographic reach that must be defined. In the American version, this has generally meant all lands subject to the ebb and flow of the tide, and all waters navigable in fact, such as rivers, lakes, ponds, and streams. Next, the uses that the trust protects and prohibits must be defined. In American jurisprudence, fishing, commerce, and navigation are core protected uses, with other uses such as boating, swimming, anchoring, and general recreation being recognized as well in most states. Uses inconsistent with those protected values may be prohibited—that is, even if the state wishes to facilitate such incompatible uses, it may be restrained from doing so. Finally, the public trust doctrine carries with it restrictions on the alienation of public trust lands to private interests when to do so would undermine the

85. In related work I advocate for this development and explore the details of such private nuisance claims. *See* J.B. Ruhl, *Making Nuisance Ecological*, CASE W. RES. L. REV. (forthcoming) (manuscript available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=931248).

86. The brief summary of the public trust doctrine that follows in the text is drawn from JOHN COPELAND NAGLE & J.B. RUHL, THE LAW OF BIODIVERSITY AND ECOSYSTEM MANAGEMENT 780-86 (2nd ed. 2006)

protected public uses. In all of these dimensions, "[c]ourts have held that consideration of trust concerns occurs in advance of proposed governmental action, requires prior comprehensive resource planning or specific cost/benefit balancing, and *includes a continuing duty to reconsider when circumstances and knowledge change.*"[87]

Areas subject to the public trust doctrine unquestionably will often contain natural capital resources supplying ecosystem service to areas within and beyond the geographic boundaries of the trust's reach. Hence, even if the scope of uses protected by the public trust doctrine is utilitarian in focus (e.g., navigation, hunting, fishing, swimming, boating), ecosystem service values fit neatly under that umbrella. In *Avenal v. State*,[88] for example, the Louisiana Supreme Court considered the claims of state land oyster bed lessees that the state's plan to move their bed sites to make way for a coastal diversion canal project constituted a taking. The purpose of the project was to restore freshwater flow (and the sediment carried with it) from the Mississippi River to coastal areas in order to impede loss of coastal marshes.[89] Because this would have lowered salinity in the waters overlying the oyster beds, the state established a program to allow operators to move their beds.[90] Many lessees, however, objected and sought compensation through an inverse condemnation action.[91]

A central issue in the case became the validity and enforceability of hold harmless clauses in most of the leases that specifically referenced coastal restoration and which the state argued was designed to support application of the public trust doctrine.[92] Under Louisiana law, the public trust doctrine is implemented as a "balancing process in which environmental costs and benefits must be given full and careful consideration along with economic, social and other factors."[93] The court found that the diversion project

> [F]its precisely within the public trust doctrine. The public resource at issue is our very coastline, the loss of which is occurring at an alarming rate. The risks

87. Richard J. Lazarus, *Changing Conceptions of Property and Sovereignty in Natural Resources: Questioning the Public Trust Doctrine*, 71 IOWA L. REV. 631, 652 (1986) (emphasis added).

88. 886 So. 2d 1085 (La. 2004).

89. *Id.* at 1088.

90. *Id.* at 1090.

91. *Id.* at 1104.

92. *Id.* at 1093.

93. *Id.* at 1101 (citing Save Ourselves, Inc. v. Louisiana Envtl. Control Comm'n, 452 So. 2d 1152, 1157 (La. 1984)).

> involved are not just environmental, but involve the health, safety, and welfare of our people, as coastal erosion removes *an important barrier between large populations and ever-threatening hurricanes and storms.*[94]

Ecosystem service values, therefore, should stand on equal footing with other economically valuable uses protected under the public trust doctrine. Indeed, when those other uses are not present in particular public trust lands, ecosystem service values provide the state a means to point not merely to environmental integrity as the basis for denying development or extractive uses, but to *economic* integrity as well. It presents no revolutionary twist of the public trust doctrine for courts, as did the court in *Avenal*, to integrate natural capital and ecosystem service values into the doctrine in this manner.[95] Rather, doing so simply reflects new knowledge of the economic importance of natural capital and ecosystem services.

IV. CONCLUSION

It is, of course, stating the obvious to observe that the common law evolves with new knowledge. And the principle appears in the *Lucas* majority opinion merely as a passing reference, something like an exception to an exception to a special rule of regulatory takings jurisprudence. Yet it also should have been obvious that the passing reference ultimately would be washed in fluorescent highlighting by lawyers searching for a way out of the categorical takings box *Lucas* constructed. To use "relevant background principles" of the common law of property as the test for how far regulation may go, and then to observe that those background principles may evolve with new knowledge, is to invite the creative minds of lawyers to find that new knowledge and figure out how to use it to budge the background principles. Blumm and Ritchie have given them the template for doing so across a broad array of common law property doctrines.

My purpose in this Article has been more specific. I am un-

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94. *Id.* (emphasis added). Although Blumm and Ritchie discuss *Avenal*, they do so in connection with the "destruction by necessity" defense to takings claims, not in connection with the court's discussion of the public trust doctrine. *See* Blumm & Ritchie, *supra* note 6, at 41-42.

95. In related work Jim Salzman and I explain how recognition of natural capital and ecosystem service values can reshape the public trust doctrine in the manner suggested here. *See* J.B. Ruhl & James Salzman, *Ecosystem Services and the Public Trust Doctrine: Working Change from Within*, 15 SE. ENVTL. L.J. 223 (2007).

abashedly interested in plugging natural capital and ecosystem service values into the common law. Step one in that project—this Article—is to define the baseline from which I am working, which corresponds handily to Justice Scalia's concept of relevant background principles. Though not written with *Lucas*-avoidance in mind, much less with explicit reference to natural capital and ecosystem service values, Sprankling's exposition on the anti-wilderness bias of American property law serves that first step well, though the story it tells is dejecting to my purpose. In short, I see an uphill road ahead.

I am all too happy, therefore, to piggy-back on Blumm and Ritchie's push for evolution of the background principles of *public* property doctrines. It makes sense for them, given their purpose, to focus on doctrines that will most come into play when private landowners challenge public regulation. That is by no means outside the scope of my purposes, but I am equally as interested in reshaping the *private* side of property law as well. The question in both contexts, of course, is what will be the new knowledge that prompts the evolutionary push? If Sprankling is right, the common law has not been much impressed thus far with appeals to ecological integrity as such. Blumm and Ritchie identify only a relatively small universe of cases suggesting otherwise.

Palazzolo and *Avenal*, however, evidence a very recent and perhaps significant trend based on judicial recognition of natural capital and ecosystem service values. The economic value of natural capital and ecosystem services surely resonates more with common law property doctrine than does appeal merely to ecological integrity. Indeed, that ecosystems produce economically valuable services undercuts the very premise of the anti-ecosystem bias of the common law. The common law, to put it bluntly, has been based on a mistaken conception of the economic value of functioning ecosystems. What could be more appropriate as new knowledge for purposes of shifting the common law's baseline?

To be sure, the context in which the two cases arise—government defense of regulatory takings claims using public nuisance (*Palazzolo*) and public trust (*Avenal*) doctrines—admittedly does not place much pressure on this argument. As the *Palazzolo* court suggested, more would be expected of a private nuisance claimant demanding relief from another landowner's curtailment of ecosystem service flows. But the new knowledge principle recognizes not simply that the common law evolves, but why it evolves. It evolves in the private property context when, among other reasons, landowners gain new knowledge about the economic harm they suffer from other landowners' actions and seek reme-

dies.[96] And when they do so in the context of economic losses associated with curtailed ecosystem service flows, cases like *Palazzolo* and *Avenal* from the public property side of the common law will have paved the way for establishing the theory of their case. And it all would have begun with Justice Scalia's passing reference to the new knowledge principle.

So, *Lucas* did open a Pandora's box and, if I am right, the impact on the common law of property will be profound.

96. *See* Paul H. Rubin, *Why Is the Common Law Efficient?*, 6 J. LEGAL STUD. 51 (1977) (explaining the reasons why private interests attempt to influence the evolution of common law).