

The World is My Oyster and Other Tales of Domination: The Critique From Ecosystem Services

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INTRODUCTION: NATURE AS —

Nature is the idea of where we are, the basis for understanding who we are, and the place in which we are present, observant, relating, and thinking. Nature is the backdrop that contextualizes all of our knowledge and inspiration. It supplies our experiences, provides the basis for finding a sense of place, and situates us within a meaningful community. Nature might be difficult to define, yet it is the constant.

Less constant are the constructs we use to understand nature. Nature might alternatively be thought of as a provider, or as chaotic, fragile, threatening, wicked, caring, beautiful, sublime, scary, or even fixable. Such ideas might be found in the Edenic narrative or a Hobbesian state, witnessed clinging to a rapidly melting chunk of frozen water, or chased through an otherwise untrammelled wilderness. The different values we impose on our experiences lend support to alternative constructs of nature. This essay takes up two competing constructions: nature as a pile of resources that are available for human use and enjoyment versus nature as a collection of processes that benefit humans. The former is reflected in what is generally thought of as resource economics—the dominant paradigm of the law’s idea of nature—in which nature

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is valuable to the extent that it can be traded in the market. The latter construct—ecosystem services—might be thought of as the benefits provided by nature that are typically not traded in the marketplace.¹

This Article levels a critique of resource-driven capitalism and the associated, facilitative property rights from the position of ecosystem services. The ecosystem services approach helps to identify ways humans need healthy and productive ecosystems: we need functioning ecosystems for the basic necessities and other benefits they provide (oxygen, potable water, warmth, shelter, food). Pitting nature as resource against nature as ecosystem services reveals that the value of nature lies beyond the price of tradeable goods and that economic regicide results not from regulation of the environment, but from ecosystem degradation. Indeed, this systems-based view recognizes that impaired ecosystems may fail to deliver both ecosystem goods and other necessities, thereby undermining the resource approach: “The notion of economic value is of little use when an ecosystem approaches a critical ecological threshold and ecosystem services become non-substitutable and absolutely scarce.”² Or, as J.B. Ruhl notes, refusal to act on our need for functioning ecosystems will result in a total loss: “Without ecosystem services, we all die.”³

This Article offers a critique of resource economics from an ecosystem services perspective. It does so by first introducing the resource economics view of nature as something to be dominated, to be used at our pleasure and convenience. Next, this Article exemplifies the shortcomings in resource economics by examining the case of the oyster and its striking decline. Finally, this Article turns to ecosystem services and the manner in which it disrupts the dominant resource-based valuation of natural things.

I. ECOSYSTEM GOODS IN CONFLICT WITH ECOSYSTEM NEEDS: WHEN THE WORLD IS MY OYSTER

In general, U.S. law and policy does not require property owners, commercial operations, or agencies to account for the value of ecosystem

1. The term “ecosystem services” has been defined as the “wide range of conditions and processes through which natural ecosystems, and the species that are part of them, help sustain and fulfill human life.” Gretchen C. Daily et al., *Ecosystem Services: Benefits Supplied to Human Societies by Natural Ecosystems*, 2 *ISSUES IN ECOLOGY* 1, 2 (1997), <https://www.esa.org/wp-content/uploads/2013/03/issue2.pdf>. The breadth and pervasiveness of our reliance on ecosystem services is illustrated in the ways we account for ecosystem services. Ecosystem services are characterized according to the type of services provided: provisioning services such as food, water, and building materials; regulating services that influence climate, disease, and water quality; cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation and nutrient cycling. WALTER V. REID ET AL., *ECOSYSTEMS AND HUMAN WELL-BEING* 7 (2005), <https://www.millenniumassessment.org/documents/document.356.aspx.pdf>.

2. Giulia Wegner & Unai Pascual, *Cost-Benefit Analysis in the Context of Ecosystem Services for Human Well-Being: A Multidisciplinary Critique*, 21 *GLOBAL ENV. CHANGE* 492, 502 (2011).

3. J.B. RUHL ET AL., *THE LAW AND POLICY OF ECOSYSTEM SERVICES* 52 (2006).

services.⁴ Instead, law generally favors getting ecosystem goods to market by treating natural things as resources; the world, we might have heard, is our oyster. Recall the passage from Shakespeare's *The Merry Wives of Windsor*:

Falstaff: I will not lend thee a penny.

Pistol: Why then, the world's mine oyster, which I with sword will open.⁵

Much might be said about Pistol's statement, including his unapologetic threat to use force to take what he desires and the suggestion that he has the power to effectuate such domination.⁶ For purposes here, the passage is particularly appropriate for his unabashed sense of entitlement to the oyster as his prize (whether intended literally as crustaceans or figuratively as things in the world). As a prize, oyster harvests have been a major part of the seafood industry's growth.⁷

We might imagine that oysters would reject the claim of their economic importance, if only such an objection could be sustained. Unfortunately, it is too late for that. From the perspective that Timothy Luke has referred to as the *resourcification* of nature, oysters have been transformed by an understanding of nature as a usable resource: members of the biotic and abiotic community are constructed as a pile of resources that are (mostly) available for the use and enjoyment of humans as goods.⁸ This understanding has driven the natural resource industry for centuries and is reinforced in environmental education programs that focus on environmental studies, engineering, forestry, geology, architecture, and other disciplines that train young professionals to solve environmental "problems" (where the term "problem" is read as the need to support economic growth).⁹ This conceptual transformation of nature, insists Luke, is powerful and potentially self-destructive: "Once nature is rendered

4. At root, perhaps "the problem for ecosystem services has been the law's utilitarian premise that developing natural resources invariably puts land to higher and better uses and maximizes social welfare where both are measured in monetary terms." Christopher L. Lant et al., *The Tragedy of Ecosystem Services*, 58 *BIOSCIENCE* 969, 972 (2008).

5. WILLIAM SHAKESPEARE, *THE MERRY WIVES OF WINDSOR*, act 2, sc. 2.

6. This approach is reminiscent of John Locke's understanding of how we find value in things as the result of human effort. See JOHN LOCKE, *THE SECOND TREATISE ON CIVIL GOVERNMENT* 27 (Great Books in Philosophy ed., Prometheus Books 1986) (1690) (valuing transformed things over stuff found in nature, stating that "bread is more worth than acorns, wine than water, and cloth or silk than leaves, skins or moss").

7. In 2016, the 37 million pounds of oysters harvested were accounted as aquaculture products. NOAA, *Fisheries of the United States* (last updated Apr. 3, 2019), <https://www.fisheries.noaa.gov/national/fisheries-united-states-2017>; NOAA, *American Seafood Industry Steadily Increases Its Footprint* (Dec. 13, 2018), <https://www.noaa.gov/media-release/american-seafood-industry-steadily-increases-its-footprint> (touting the "vital economic benefits provided by commercial and recreational fisheries to American communities" while looking at the 1.6 percent increase in seafood landings and imports from 2016 to 2017).

8. Timothy W. Luke, *Eco-Managerialism: Environmental Studies as a Power/Knowledge Formation* (Lecture at York University, Oct. 3, 2002) (transcript available at <http://aurora.icaap.org/index.php/aurora/article/view/79/91>).

9. *Id.*

intelligible through such practices, it is used to legitimize many political projects.”¹⁰

II. NO MORE OYSTERS, AND NO MORE OYSTER HABITAT

Oysters typically thrive in salty or brackish waters.¹¹ Oysters cluster as they grow, fusing together atop of any submerged structure available (geological structures, docks and piers, other shells and so on).¹² Early explorers of the Americas coastal inlets were forced to navigate around abundant oyster reefs.¹³

Oysters and their associated structures play important roles in marine ecosystems. The Chesapeake Bay Program reports as follows:

Oysters are natural filter feeders. This means they feed by pumping water through their gills, trapping particles of food as well as nutrients, suspended sediments and chemical contaminants. In doing so, oysters help keep the water clean and clear for underwater grasses and other aquatic life. One oyster can filter more than 50 gallons of water in a single day.¹⁴

In addition, oyster reefs provide hundreds of other aquatic animals and plants with foraging and shelter habitat.¹⁵ Oyster reefs provide barrier protection against storm surges and tide, recreational opportunities and employment for commercial fishermen.¹⁶ Oysters are a keystone species, and oyster reefs are critical marine ecosystem components.¹⁷ One study estimated that the value of oyster reef services amounted to \$55,000 to \$99,000 per hectare, without accounting for oyster harvesting.¹⁸

For oysters and humans alike, resourcification has been devastating. Eastern Oysters were initially encountered in the 1600s, followed by extensive harvesting by dredging, leading to the growing concern about oyster bed decline through the 1800s.¹⁹ Only a fraction of suitable oyster reef habitat remains functional, which translates into an increasingly limited supply of naturally-occurring oysters.²⁰ Oyster population declines have had a significant impact on

10. *Id.*

11. NOAA, *Oyster Reef Habitat* (last updated Feb. 4, 2022), <https://www.fisheries.noaa.gov/national/habitat-conservation/oyster-reef-habitat>.

12. *Id.*

13. *Id.*

14. Steve Droter, *Oysters*, Chesapeake Bay Program, <https://www.chesapeakebay.net/issues/oysters> (last visited Feb. 23, 2022).

15. *Id.*

16. Jonathan Grabowski et al., *Economic Valuation of Ecosystem Services Provided by Oyster Reefs*, 62 *BIOSCIENCE* 900, 905 (Oct. 2012).

17. *Id.* at 900.

18. *Id.* at 900.

19. See generally Victor S. Kennedy & Linda L. Breisch, *Sixteen Decades of Political Management of the Oyster Fishery in Maryland's Chesapeake Bay*, 164 *J. ENVTL. MGMT.* 153, 153-171 (1983).

20. Jonathan Grabowski & Charles Peterson, *Restoring Oyster Reefs to Recover Ecosystem Services*, in *ECOSYSTEM ENGINEERS: PLANTS TO PROTISTS* 281 (Kim Cuddington et al., eds., 2007) (estimating that overharvesting in Virginia reduced oyster harvests from a value of \$65,876 per hectare

the services that oysters provide: “In the late nineteenth century, the Bay’s oysters could filter a volume of water equal to that of the entire Bay in three or four days; today’s population takes nearly a year to filter this same amount.”²¹

Not surprisingly, overharvesting and habitat degradation are among the primary causes for the declines.²² Dredging—a historically preferred practice of dragging large metal nets across the water floor—gathers large quantities of oysters but leaves little in place for the development of future oyster beds.²³ Oyster harvesting practices have often degraded oyster reefs beyond recovery of basic ecosystem functions.²⁴ Due to such harvesting practices, an estimated 85 percent of oyster reef habitat has been lost over the past 130 years.²⁵ Of course, in the absence of productive habitat, humans must turn to artificial reef construction and aquaculture cultivation, both of which have dominated the industry since signs of oyster decline two centuries ago, but neither of which are safe from pollution and other challenges.²⁶ The problem is one of embedded resourcification: “Contrary to the traditional view, in which oysters are valued solely as a fishery commodity, the scientific literature clearly shows that oysters provide a host of nonmarket ecosystem services.”²⁷

Widespread, ongoing ecosystem degradation and the resulting loss of ecosystem services, places us in an expensive struggle to maintain the well-being that we previously enjoyed: for instance, in the absence of oysters and oyster habitat, we no longer benefit from water filtration done by oysters, while the ecosystem (humans included) must find ways to artificially replace foraging and shelter habitats, storm surge protection, and recreational and employment opportunities.

in 1890 to \$2640 per hectare in 1991); *see generally* COMM. ON NONNATIVE OYSTERS IN THE CHESAPEAKE BAY, NONNATIVE OYSTERS IN THE CHESAPEAKE BAY 100–119 (2004).

21. Droter, *supra* note 14.

22. Graham Averill, *Eat More Oysters. It's Good for the Environment*, OUTSIDE (Jun. 28, 2019), <https://www.outsideonline.com/2398648/oyster-farming-environment> (“Watermen just pulled too many oysters out of the water,” fishermen have said. “Pollution and disease didn’t help, but the biggest problem was overharvesting. They hacked away the reefs.”).

23. Ernst Ingersoll described the practice: “Dredges are bags made of iron rings linked together, forming meshes similar to those of an ordinary seine, the mouth being held open by an iron frame, from the four corners of which project four iron bars converging to a point at a distance of a few feet from the mouth; to this point a short chain is attached, and joined to the chain is a long rope which winds around the windlass. Projecting downward from the bar, attached to the lower edge of the mouth, are iron teeth, which, as the dredge is drawn over the bottom, scrape up the oysters and guide them into the bag.” ERNST INGERSOLL, *THE OYSTER INDUSTRY* 158 (Wash. Gov’t Printing Off., 1881).

24. Grabowski et al., *supra* note 16, at 903.

25. *Id.* at 900.

26. Habitat decline from urbanized, industrial, and agricultural operations, as well as other sources of pollution, continue to threaten the ability of oysters and their associated habitat to provide these valuable services, while weakening oysters and making them more vulnerable to disease. *See* S.C. Gall & R.C. Thompson, *The Impact of Debris on Marine Life*, 92 MARINE POLLUTION BULL. 170 (2015); Rossana Sussarellu et al., *Oyster Reproduction is Affected by Exposure to Polystyrene Microplastics*, 113 PROC. NAT’L ACAD. SCI. 2430 (2016); Cole Matthew & Tamara S. Galloway, *Ingestion of Nanoplastics and Microplastics by Pacific Oyster Larvae*, 49 ENVTL. SCI. TECH. 14625 (2015).

27. Grabowski et al., *supra* note 16, at 901.

III. ECOSYSTEM SERVICES AS DISRUPTIVE

From an ecosystems perspective, the fate of the oyster illustrates the problems of how we value ecosystem goods and the ensuing market failures that occur when we fail to account for lost and interrupted ecosystem services in our extraction practices. The critique from ecosystem services champions the notion that non-functioning ecosystems do not provide humans the benefits of natural services, a simple fact that is not otherwise represented when we view nature only as a resource for harvest and use.²⁸ The resource-based understanding of nature²⁹ facilitates both unapologetic markets and the ignorance of service-degrading externalities. In this view, nature consists of many marketable goods.³⁰ Some goods are ready for market (land and bananas), some need to be captured (wild animals and water), and many need to be processed and transformed before bringing to the consumer market (oil, gas, minerals). For ecosystem goods, market factors determine when something from nature is ready to be treated as a good, and laws have generally functioned to make sure that nature is available for the taking.³¹ The laws that facilitate the marketability of nature protect the capture and extraction of goods, and in this way, law defines what aspects of nature have market value.

Under neoclassical economic theory, market value is more persuasive when it reflects perfect market-relevant information.³² Yet, assuming the prevalence of a dominant construct of nature that values ecosystem goods but not services,—one that only views nature as a pile of tradeable goods—it should not be surprising to find that market transactions do not account for the costs of overharvesting, habitat loss, or ecosystem degradation.³³ Instead, expectations, agreements, and goods are valuable when they are tradeable, and the marketability of goods is protected (as property, IP, entity ownership, employment), with the related services left out.³⁴

Nature also provides services that are essential for human well-being. In addition to producing ecosystem goods, natural processes support crop growth and photosynthesis, regulate the temperature and chemical makeup of the air and

28. James Salzman et al., *Protecting Ecosystem Services: Science, Economics, and Law*, 20 STAN ENV. L. J. 309, 312 (2001).

29. Timothy Luke refers to the “resourcification” of nature, a nifty move that defines nature as a stockpile of resources or a warehouse of goods. Luke, *supra* note 8.

30. *Id.*

31. *Id.*

32. Bruce C. Greenwald & Joseph E. Stiglitz, *Externalities in Economies with Imperfect Information and Incomplete Markets*, 101 Q. J. OF ECON. 229, 259(1986).

33. COMM’N ON ECOSYSTEM MANAGEMENT, *Services*, IUCN, http://www.iucn.org/about/union/commissions/cem/cem_work/cem_services/ (last visited Feb. 23, 2022); Salzman et al., *supra* note 28, at 311.

34. See Christopher L. Lant et al., *The Tragedy of Ecosystem Services*, 58 BIOSCIENCE 969, 970-71 (2008) (“...marketable services fare better than services that either are non-marketable or that derive from natural capital lacking clearly defined property rights.”).

water, and provide places for recreation, community, and spiritual connection.³⁵ These benefits are not often traded in the market or reflected in the market value of tradeable goods, but their value is immense.³⁶ Ecosystem services, from an economics perspective, give substance to the otherwise ignored ecosystem processes that provide benefits to humans.³⁷

The capture and extraction of ecosystem goods often interferes with the natural processes that provide these essential services to humans and that would otherwise provide an array of co-benefits to the non-human environment (for example, logging converts forests into marketable timber, but meanwhile results in vast losses of habitat, air and water quality services, slope stability, and other valuable services provided by standing trees). Interference with the delivery of these services can be costly.³⁸ That cost is seldom borne by the owner of the goods in terms of liability, responsibility, even acknowledgement.³⁹ Rather, the benefits of ecosystem services are denied, and the costs of resourcification are borne by others, sustaining the inequitable distribution of ecosystem benefits.⁴⁰ By accounting only for resourcification of nature, we are constantly creating a market failure through the sale of ecosystem goods.

CONCLUSION

The critique from ecosystem services does not deny economics, but instead posits that taking a resource approach to the natural world causes real and long-term harm to environmental and economic outcomes alike. Constructing nature as a pile of available resources operates to both the exclusion and destruction of the critical services provided by nature and natural processes. What we know is that we inevitably suffer market failures when relying on market pricing to value the resourcified environment, as such pricing inevitably obscures, deflates, and hides the costs of interfering with ecosystem processes that provide other essential but largely unmarketable services.⁴¹ What is left to be addressed is the socio-ecological and socio-economic impacts from resourcification and how a

35. See Daily et al., *supra* note 1, at 2; see also Robert Costanza et al., *The Value of the World's Ecosystem Services and Natural Capital*, 387 NATURE 253, 254 (1997); REID ET AL., *supra* note 1, at 40.

36. COMM'N ON ECOSYSTEM MANAGEMENT, *supra* note 33.

37. See RUHL ET AL., *supra* note 3, at 24; see also Salzman, *supra* note 28, at 311.

38. See, e.g., Grabowski, *supra* note 16, at 903 (stating that the depletion of submerged aquatic vegetation habitat in the Chesapeake Bay has resulted in an estimated loss in fisheries value of 1–4 million dollars annually).

39. Luke, *supra* note 8.

40. *Id.*

41. COMM'N ON ECOSYSTEM MANAGEMENT, *supra* note 33 (“One major reason for the continued loss and degradation of ecosystems is that the value (importance) of ecosystems to human welfare is still underestimated in most economic development decisions because the benefits of their services are not, or only partly, captured in conventional market economics.”).

critique of resource-based economics (and the system of law that props it up) maintains distinctions that are inequitable based on race, class, and ecology.⁴²

42. Ecosystem services analysis has made progress in identifying ecosystem management disparities among class and race and has been used to uncover tensions between local/transnational ecosystem use. See, e.g., Keith H. Hirokawa & James Gathii, *Curtailing Ecosystem Exportation: Ecosystem Services as a Basis to Reconsider Export-Driven Agriculture in Economies Highly Dependent on Agricultural Exports*, 30 VIRG. ENV. L. J. 1 (2012). Nonetheless, many have posed legitimate concerns over the way that an ecosystem beneficiary-based regime can undermine cultural constructs in a way that results in the allocation of rights and power, including cultural notions of gender, wealth and race. See Unai Pascual & Caroline Howe, *Seeing the Wood for the Trees: Exploring the Evolution of Frameworks of Ecosystem Services for Human Wellbeing*, in ECOSYSTEM SERVICES AND POVERTY ALLEVIATION: TRADE-OFFS AND GOVERNANCE 3,14 (Kate Schreckenberg, Georgina Mace and Mahesh Poudyal eds., 2018) (“Including social power relations in ecosystem service frameworks is vital to understand the institutional context of differentiated social groups. For instance, land allocation and associated ecosystem service flows in many African societies respond less to productivity and more to cultural considerations via gender roles, allowing certain social elites to maintain control. It follows that justice must become more central in ecosystem service framings, considering socially differentiated groups of people with respect to wealth, power, gender and identities.”).