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Joseph L. Sax
Berkeley Law

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Comment on John Harte's Paper, "Land Use, Biodiversity, and Ecosystem Integrity: The Challenge of Preserving Earth's Life Support System"

*Joseph L. Sax**

John Harte's paper is important for a number of reasons. First, his descriptions of ongoing habitat loss and of the significance of various disputed matters, such as the effort to protect genetically-distinct populations, is—though not unfamiliar at least in its basic elements—highly informative. Second, Harte's more striking theme explains how some of the standard measures used to determine the outcomes of legal actions and public policies are in fact overly crude and even misleading. For example, he points out that habitat not considered to be "lost" may nonetheless no longer be able to sustain either the abundance or the variety of species that it formerly did. Similarly, Harte notes that conventional approaches to estimating extinction are of limited value, both because they do not distinguish areas based on measures of biological richness, and because they fail to account for the biological importance of different size tracts, such as a number of isolated small patches of land as compared to a single large area with more interior and fewer vulnerable edges.

Especially significant to me, as a specialist in property law, is Harte's recognition of the importance of managing *all* land, public and private, pristine and developed, in an ecologically rational manner. That is, he derives from a scientific understanding of biodiversity the fundamental legal point that land ownership is a trust—even at the level of managing suburban subdivision development. While of course Harte is not the first to make this point, he provides a new and much needed

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* Professor of Law, University of California at Berkeley School of Law (Boalt Hall).

sense of urgency by framing the issue in the context of knowledge of the far-reaching effects of bad land use decisions on climate warming, and of the consequences of extreme weather events such as hurricanes. Harte uses this knowledge to help explain the importance of moving away from what he calls “the widely held view that land ownership is [except for certain discrete and tangible harms to others] inviolate.”¹

Equally important is Harte’s recounting of the many distinctive aspects of biodiversity loss that distinguish it from other problems. I refer to Part II of his paper, “What is Special About the Problem?,” in the subsection devoted to “ambiguous damage symptoms.” Here, for example, Harte points out that there is no single useful tool for determining the severity of the consequences of biodiversity loss; that loss of species is almost certainly not the best measure of the loss of ecosystem services; that habitat loss occurs piecemeal and incrementally over time; that the effects of habitat loss are usually subtle and difficult to determine; that we are unable to define thresholds beyond which we dare not pass; that ecosystem services are probabilistic and thus their loss is difficult to connect to specific acts of ecosystem degradation; and that virtually every human activity degrades habitats.

One lesson Harte draws from observing the distinctiveness of the biodiversity problem is that the public is likely to have a difficult time acknowledging and understanding the importance of the issue, and the urgency of addressing the problem. I am sure he is correct, but I would add a footnote or two to his observation, from a lawyer’s perspective. First, the biodiversity problem is by no means the first instance in which society has been unable to monetize values. I would call attention to the Wilderness Act, where the public values at stake are in a sense even more elusive; or, at least it is difficult to compare the relevant public values with the potential economic values lost from withdrawing lands from developmental opportunities.

It is also an interesting fact that while the public, in a broad sense, supports biodiversity protection (for example, opposes weakening of the Endangered Species Act (ESA)), it also sympathizes with the individuals who find themselves subject to the powerful constraints imposed by the Act. While this may seem paradoxical at first, the paradox may be explained by some of the facts spelled out in Harte’s paper: it is very difficult (for the

1. John Harte, *Land Use, Biodiversity, & Ecosystem Integrity: The Challenge of Preserving Earth’s Life-Support System*, 27 *ECOLOGY L.Q.* 929, 955 (2001).

ordinary citizen no less than for the scientist) to link the large-caliber problems of biodiversity loss to the specific developmental acts of individual landowners or to see the usual cause and effect relationships between an individual construction project and the colossal harm to the global future that experts like Harte and E. O. Wilson describe. As a result, strong public sympathy with the goal, and at least a general appreciation of the gravity of the problem may be conjoined with concern about the fairness or appropriateness of the means currently employed.

Put in slightly different terms, it may well be that the biodiversity problem does not comfortably lend itself to conventional legal regulatory regimes of the sort that the ESA embodies. Perhaps public opinion intuitively reflects an understanding that ESA cases are—as Harte notes—unlike the conventional situations that we subject to conventional regulatory solutions. In the ordinary case, X is prevented from doing act Y in order to prevent consequence Z. It is easy enough to understand this sort of cause-and-culpability model in an ordinary auto accident or nuisance case, or even in most contemporary industrial water or air pollution cases. But that can hardly be said for the usual ESA case, where—for all the reasons spelled out by Harte—it is very difficult or even impossible to demonstrate ordinary cause-and-effect relationships between X, Y, and Z. Moreover, and to make matters more difficult yet, the outcome Z, in ESA cases (extinction of a specific species or population), is not actually the ultimate harm about which we are concerned. The larger concern is loss of habitat, leading to loss of biological productivity, that potentially and ultimately threatens genetic heritage in some much larger and more pervasive sense than the extinction of any single species. Thus, the cause and effect chain is even more attenuated than the law itself acknowledges.

Though he never puts it quite this way, one message lawmakers might take from Harte's paper is that we have created the setting for public misunderstanding because the legal structure we have created (ESA, a regulatory X-Y-Z type law) is so removed from the problem that we should be addressing. Thus, it is not surprising that people often sense that in ESA cases the "punishment does not fit the crime;" that is, they cannot see or understand the relationship between the burden imposed on a landowner and the public benefits achieved or the harm averted. Harte makes this point as to a more self-interested constituency when he notes that our "inability to . . . define thresholds beyond which we dare not pass provides

proponents of unrestrained land use with ammunition that they use unabashedly.”²

The problem is further complicated because proponents of biodiversity protection are reluctant to criticize the ESA for fear of unintentionally abetting the cause of those who want to weaken the Act in order to lift restraints on land and water use, and who are not really concerned about the biodiversity issue. This is doubtless a prudent political strategy, for if advocates for species and habitat protection acknowledge that there are fairness problems deep in the structure of the ESA, the results would likely lead to weaker laws rather than better laws. I should perhaps clarify that when I say there are fairness problems, I refer to the question of how we go about setting implementation priorities and allocating the burdens of biodiversity protection, not to the notion that not all species loss should be a matter of concern.

Reluctance to criticize the ESA may also be traced to an entirely reasonable concern about the difficulty of fashioning a different sort of biodiversity protection law that has any real effectiveness, or “teeth,” to use the familiar lawspeak term. The great attraction of the ESA is that it has an effective action-triggering mechanism. A petition focuses on a specific species and generates a technical inquiry into risk of extinction. That technical determination produces action by public agencies and private operators through concrete mechanisms such as the biological assessment, biological opinion, and reasonable and prudent alternatives, leading to a specific type of approved (or disapproved) plan.³ The law has almost none of the soft spots or loopholes that are frequently found in well-meaning, broadly-phrased laws, such as the so-called “multiple use” mandate that generally governs management of the public lands,⁴ or the language of “uses compatible with . . . major purposes” that applies to recreational activities on the national wildlife refuges.⁵ No one has yet come forward with a regulatory-style law that effectively controls resource uses and incorporates both the administrative virtues of the ESA and a sensitivity to the deeper needs of biodiversity protection, while avoiding the equity problems that the ESA raises in certain settings. Indeed, I am

2. *Id.* at 951.

3. *E.g.* 16 U.S.C. § 1536(b)(4)(A) (West 2000).

4. *See* Federal Land Policy and Management Act, 43 U.S.C. § 1702(c) (West 2000).

5. National Wildlife Refuge Administration Act, 16 U.S.C. § 668dd(d)(1)(A) (West 2000).

not sure it is possible to draft such a law in the regulatory model.

This line of thought seems to lead to the conclusion that the biodiversity problem is unique in the difficulty it presents of linking specific conduct to the diffuse, sometimes remote-in-time, large-scale adverse impacts about which we are ultimately concerned. This idea is certainly what Harte's paper appears to suggest. Let me offer a somewhat different perspective. No doubt the challenge of biodiversity protection is unique in some ways, but perhaps it is not quite as unprecedented as it may appear. We faced an analogous issue nearly a century ago when the harmful effects of urbanization were first beginning to be recognized in burgeoning American cities. Those problems—congestion, transportation, safety, education—could not be easily correlated with particular building plans or specific land uses. Moreover, the only legal and policy tool then available was the law of nuisance, where each individual development was tested in a cause and effect relationship. Did X's action, Y, lead to harmful effect Z? Obviously, that is not an effective way to engage with the etiology of urban ills. Before long it was virtually everywhere understood that the way to address the problems of urbanization was to look at the city as a whole, through such lenses as transportation and land use planning, rather than to rely on the case-by-case nuisance model.⁶ The contemporary prevalence of land use planning laws also suggests that Harte's statement that except for "tangible aesthetic or safety impacts on our neighbors," the view that "we can do what we wish on our own land . . . is the prevailing force governing land use" is far too pessimistic.⁷

By way of analogy, one may see a parallel relationship between how the ESA stands in relation to the loss of biodiversity and how the traditional nuisance action stood to urbanization. Insofar as that is the case, we find ourselves embroiled in a dilemma. Our single most important and powerful law addressing biodiversity is structurally ill-fitted to the job that needs to be done. A central question is whether we can find a more ecosystemic approach that will advance this area of public policy, as the 1920s land use control movement shifted us beyond the limitations of traditional nuisance litigation and its strict cause-effect structure.

6. The precedent-setting case legitimizing the zoning/planning approach was *Euclid v. Ambler Realty Co.*, 272 U.S. 365 (1926).

7. Harte, *supra* note 1, at 955.

Not surprisingly, Harte seems rather pessimistic on this score as well. He is fully aware of the limitations of the ESA. The most promising approach, he says, would be for the public to purchase and protect tracts of land adequate to the size, scope, and location of the resources requiring protection. But he acknowledges the economic and political constraints on any such effort; the costs of acquisition would be enormous and would generate widespread resistance by owners who commonly oppose government land acquisition, even where compensation is paid. Similarly, he notes that our existing public reserves are not congruent with the needs of a full biodiversity policy (e.g., they are too small, they allow too many incompatible activities, and they are subject to impacts from nearby lands or watercourses). As to private lands, Harte quite properly observes that proprietary attitudes restrict opportunities to control use and development.

The question Harte leaves is whether there is any reason to be hopeful, or any agenda that concerned but realistic people ought to follow. My own view is that while the risk of failure is always present, we need not be quite as despairing as I take Harte to be. I believe two independent strategies can fruitfully be followed. The strategy that I will mention first is much more ambitious and problematic than the other, but it is equally important. Indeed, I think it is essential to do everything we can to place this strategy on the active public agenda, even though some of its elements have little prospect of being implemented in the short run.

By way of preface, I want to emphasize the importance of not abandoning something that needs to be done simply because it faces great political or economic obstacles. Nothing can get on the public agenda unless it is repeatedly brought to the public's attention and kept there, while its importance is insistently emphasized. Many things that seem commonplace today were, not long ago, in the category of political pipe-dreams. Even a decade ago, one would have been hard-pressed to find major land developers sitting around with "their" biologists figuring out how to protect habitat for protected species found on their land so that they could get on with their business.

As the Harte paper makes clear, scientists have quite a good and specific understanding of what needs to be done to initiate an appropriate biodiversity policy. Indeed, the agenda has been set out in quite specific terms in Chapter 14 of E. O. Wilson's

book, *The Diversity of Life*,⁸ and as one considers it, it does not seem at all an impossible dream. Indeed, Wilson's plan appears to be a practical and specific proposal. Certainly it cannot be put into effect at once, or in full, but it can be proposed to the public as a primary environmental goal for the first decades of this new century. I would hope that no opportunity is let pass without emphasizing that the program set out by Wilson and noted by Harte in his paper is where we need to go. In essence that program consists of four interrelated elements, some parts of which are already in process to at least a limited degree. These four steps are:

1. Surveying what we have;
2. Defining needs;
3. Developing plans to meet those needs; and
4. Adapting institutions so they can implement those plans.⁹

This is by no means a fanciful agenda. Indeed, it is full of common sense and much of it describes realistic aims. First, we need to continue inventorying our lands to learn much more about what we have by way of biological wealth, and where it is located. Perhaps the most essential aspect of this work would be to identify what Wilson calls hot spots and warm spots, that is, those places richest in biodiversity and which should serve as our highest priorities.¹⁰ Creating a comprehensive set of maps pinpointing the places where work urgently needs to be done would benefit this country as well as less developed nations. I could visualize many such maps distributed to the public, stamped with the heading "Our Biological Heritage—Our National Agenda."

That alone would advance the process of setting the right sort of national biodiversity agenda. It has focus and it tells people that there is a determinable priority job to be done. Former Interior Secretary Bruce Babbitt's effort to establish a National Biological Survey was an important landmark in seeking to realize a part of the Wilson agenda as public policy.¹¹ Unfortunately, Babbitt's efforts ran up against a Congress dominated by ecologically backward-looking forces, and neither the goal of obtaining Congressional authorization nor the

8. E. O. WILSON, *THE DIVERSITY OF LIFE* (1992).

9. *Id.* at 311-42.

10. *See id.* at 336.

11. *See* Edward J. Heisel, *Biodiversity and Federal Land Ownership: Mapping a Strategy for the Future*, 25 *ECOLOGY L.Q.* 229, 254-55 (1998).

Secretary's administrative initiative was allowed to take root.¹² But the precedent exists, and together with private initiatives already well under way, we are getting the mapping element of the program in process.

Next, Wilson explains, we need to determine what it takes to provide the conditions for the viability of species. This work would respond to some of the matters Harte describes, showing how large tracts of land need to be, what is required by way of corridors of connectivity, what sort of buffers are needed, etc. One very valuable task would be to compare a map of what we need, at least to protect hot and warm spots and to fulfill the biological needs of already-protected areas (by providing connective corridors, controlling adjacent threats, and the like), with a map of our existing public domain. Such comparative maps might encourage a major rethinking of public domain policy, in which we might begin to consider a massive reorientation of public lands, with a goal of achieving a public domain that reflects the nation's biodiversity protection priorities, as contrasted with the heavily accidental public domain we now have.

Perhaps it is time to begin asking whether a program of major exchanges of biologically-poor, commodity-rich lands for the most important biologically-rich lands is what federal and state land agencies should be thinking about as a primary task for the beginning decades of the twenty-first century. In this regard, I call your attention to Harte's point that "huge areas of once ecologically healthy private land in the United States, far more land than is now or ever could be in public protected status, are gradually being converted to land with little ecological value."¹³

In response to that salient point, I would raise a perhaps radical-seeming question: What if we took a long look at some of the hundreds of millions of acres of public lands outside parks, refuges, and wilderness, and other pristine though not designated places, and thought about them as possible trading stock for those most biologically valuable and threatened private lands to which Harte is referring? Isn't the time ripe to re-examine the assumption that only exploiters can talk about re-allocation of the public domain? Then, perhaps, the impossible dream that Harte speaks about would not seem so impossible. In

12. See *id.*; see also Gary Lee, *GOP Environmental Tactics Scored*, WASHINGTON POST, Feb. 27, 1996, at A17.

13. Harte, *supra* note 1, at 961.

short, has anyone thought about what the highest and best use of a public domain is, and what it would look like, as compared with what we have now? If we are not infinitely rich, so that we can hope to buy everything we need to protect and still keep everything we have, maybe there is still a far better solution than simply keeping all that we have, and lamenting what we cannot arrange to acquire.

Wilson's final two elements, putting in place a plan to meet our needs, and achieving the institutional changes necessary to implement such a plan, may seem even more out of reach than the earlier steps. He calls for what effectively might be called biocentric zoning—moving from the hottest spots to the most developed but still functional areas, and limiting uses with reference to the significance of the place for biodiversity purposes. These zones would begin with inviolate reserves and move along to what Wilson calls extractive reserves, then to buffer zones where activities like agriculture are permitted, and finally to developed areas where schemes similar to those mentioned by Harte are employed to maximize their still-remaining biological values: placement of woodlots, hedgerows, and ponds within and around places already disturbed by human development. To get these results, major institutional changes would be required. We need to rethink conventional private property notions, to enlarge the duty of stewardship that we already recognize in the historic preservation setting, and to increase land management on a bioregional rather than political-boundary basis.

Stated starkly, the implementation element of the agenda may seem utopian. But I suggest that it will not be as difficult to realize as may at first seem to be the case. Admittedly, we are unlikely to legislate bioregional land management; Congress will undoubtedly not provide more ecologically attractive redefinitions of private property rights, and no public bodies will stand up and call for the abolition of city or state boundaries in order to create new bio-units of government. However, the great secret of American legal/political life is our amazing ability to achieve by increment and indirection what could never be done openly and directly. There is, in our world of administrative government, a kind of evolutionary common law process in which case by case, incident by incident, truly significant changes occur, which then by acquiescence and repetition, become normalized. In this way, some truly astonishing changes occur.

From an ecological perspective, and despite its limitations as noted earlier, probably no change agent of this sort has been more innovative than the ESA as it is currently being administered. In this respect I would take some issue with Harte's statement that conservationists are correct in arguing that the ESA is, *in practice*, essentially a species protection, and not a habitat protection, law. In *structure* that is an accurate statement, but in *practice*, at least in recent years, ESA administration has increasingly focused on habitat management through the so-called habitat conservation plan (HCP) processes, especially insofar as it presses for multiple species conservation plans, for including candidate as well as already-listed species, and for managing on larger and larger landscapes.

E. O. Wilson speaks of the ESA as a safety net.¹⁴ Many in the environmental community see the Act as insufficiently strong or broad in its coverage, or as insufficiently implemented by government. Each of these characterizations may, in some sense, be accurate, but each of them also bypasses some of the extraordinary changes that have occurred under the aegis of ESA enforcement—changes that have actually implemented some of the elements of bioregionalism that Wilson advocates while reorienting conventional property rights and obliterating traditional political boundaries in favor of ecological ones.

Changes have taken place in a variety of ways and places. Perhaps the most familiar example is the planning that has gone forward in the northwest forests in response to the decline of the spotted owl.¹⁵ My focus is less on the adequacy of that particular plan than on the organizational changes it spawned. Note first that as to public land, the tradition is to manage every enclave separately, each with its own mandate. In addition, public and private lands are traditionally subject to entirely separate regimes. ESA compliance necessarily blurs or even obliterates these lines. The reason is that the ESA can only be implemented in terms of habitat; thus, the focus of attention is inevitably shifted from traditional boundary lines to habitat lines. The Northwest Forest Plan dramatically illustrates such a reorientation. Even if regulation is limited to the public lands, what happens on those lands necessarily reflects the uses being

14. WILSON, *supra* note 8, at 337.

15. See generally DEP'T OF AGRIC. & DEP'T OF INTERIOR, FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT ON MANAGEMENT OF HABITAT FOR LATE-SUCCESSIONAL AND OLD-GROWTH FOREST RELATED SPECIES WITHIN THE RANGE OF THE NORTHERN SPOTTED OWL (Feb. 1994).

made on private lands within the habitat of the species in question.

Similar changes can be observed in a variety of settings. As ESA problems were encountered on the Platte River in Nebraska, the search for a solution necessarily moved back up the River into Wyoming and Colorado; what began as a local, one-state issue turned into a joint effort by three states, bound together by a need to do basin-based, which is to say ecosystemic or bioregional, planning.¹⁶ Federal, state, and private parties all had to work together because each had a stake in the allocation of the river's waters. Other changes naturally followed, among them modifications to what might be seen as property concepts. For example, one part of the planned solution was to create a so-called environmental account of water held in the reservoir behind a major dam, a kind of aqueous bank account that could be used for releases when needed by designated species downstream. Previously the water in a dam was understood to be held for the use of those who diverted the stored water out of the river, typically cities and irrigated agriculture. Subtly, however, the concept of an environmental water account (an idea that is now being used in a variety of settings) imposes a sort of public obligation on what had previously effectively served as a purely private asset. The Platte River planning has also generated some technical innovations: for example, authorities in Colorado agreed to take some water during times of abundance and to store it underground, releasing it when and as needed for downstream habitat enhancement purposes.

Similar river basin-wide or landscape-based planning is being innovated in a variety of settings. One prominent example is the Bay-Delta in California, where what was traditionally purely a water supply set of issues has now expanded into an integrated effort to provide supply reliability, protect fish, prevent salinity intrusion, and secure Delta low-lying lands, thus providing a model (though still very much knotted in controversy) for bioregional planning.¹⁷

A similar effort is ongoing in the Everglades, where for the first time in many decades the ecological health of the protected public lands is being re-linked to its water sources, long denatured and developed as sugar plantations. Thus, South

16. See Joseph Sax, *Environmental Law at the Turn of the New Century*, 88 CAL. L. REV. 1 (2000) (forthcoming).

17. See CALFED BAY-DELTA PROGRAM, DRAFT ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT (CALFED Bay-Delta Program CD-ROM, June 1999).

Florida is being reconceived along natural lines, with its natural services coming to the fore.¹⁸ On an even larger scale, the Columbia River Basin, long an image of dams, aluminum production, barge traffic, and hydropower, is being conceptualized anew in terms of salmon—yet another subtle way that notions of property evolve in tandem with efforts to restore the natural services of natural resources.¹⁹ In what is perhaps the most striking element of all in these various venues, we find the most surprising people sitting around trying to figure out how to restore populations of wild salmon, or worrying about the needs of the whooping crane, or the red-cockaded woodpecker. These are the same folks—timber industry executives or farmers, for example—who, only a short time ago, were thinking only of allowable cut in the forest, or acre-feet of water needed for growing rice or alfalfa.

By indirection, we are doing a lot more than meets the naked eye. The scale is still very small in respect to need, and the challenge is admittedly vast. But things are not as bad as they sometimes appear. Cheer up, John Harte.

18. See Niel Santaniello, *Scientists Assessing Glades Blueprint*, FORT LAUDERDALE (FL) SUN-SENTINEL, Dec. 3, 1999, at 3B.

19. See Joseph Sax, *The Ecosystem Approach: New Departures for Land and Water*, Closing Remarks, 24 *ECOLOGY L.Q.* 883 (1997).