

ADAPTING TO CLIMATE CHANGE: WHO SHOULD PAY

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I. INTRODUCTION

In *Massachusetts v. EPA*,² the Supreme Court, for the first time, acknowledged the reality of climate change. The state of Massachusetts brought suit to challenge the Environmental Protection Agency's (EPA) refusal to limit carbon dioxide (CO₂) emissions from automobiles.³ To gain standing, the State had to demonstrate that it was injured by climate change.⁴ Central to its claim of injury was the allegation that sea level rise, caused by climate change, had already begun to eat away at its coastlines and would increasingly do so in the future.⁵ The State also cited the funds that it would be required to spend to ameliorate the im-

1. Sho Sato Professor of Law, University of California, Berkeley, Boalt Hall. An earlier version of this article was presented as Florida State University's Distinguished Lecture in Environmental Law in March 2007. I would like to thank Dave Markell and Evan Mills for their helpful comments in connection with this project, as well as members of the audience and other FSU faculty members who raised interesting issues at the lecture. This article is a companion piece to Daniel A. Farber, *Basic Compensation for Victims of Climate Change*, 155 U. PA. L. REV. 1605 (2007), which discusses some of the same issues but approaches them from a different angle. Further issues about compensation will be addressed in another forthcoming paper, Daniel A. Farber, *Who's to Blame? Assigning Responsibility for Climate Change Impacts and Adaptation Costs*, 26 UCLA J. ENVTL. L. & POL'Y (forthcoming 2007).

2. *Massachusetts v. EPA*, 127 S. Ct. 1438 (2007).

3. *Id.* at 1446.

4. *See id.* at 1446-47.

5. *Id.* at 1456.

pact of climate change.⁶ Because the state sought only regulatory action by the EPA, there was no occasion for the Court to consider the question of who should ultimately bear the costs of such climate change impacts. That cost-allocation issue is the subject of this Article.

As Justice Stevens' opinion for the Court recognized, climate change is already upon us.⁷ As most people now realize, we can no longer postpone serious consideration of how to respond to this threat. Most public attention has been focused on the issue of mitigation—that is, how to reduce greenhouse gas levels and by how much, so as to limit future increases in global temperatures.⁸ A less publicized, but also critically important topic, is the need to begin adapting to climate change. Adaptation is not going to be cheap. It is too early to make confident cost estimates, but the expense for the United States is clearly going to be in the billions of dollars annually for the next few decades.⁹

Adaptation has been a neglected topic, in part because mitigation seems more urgent, and in part for political reasons. The political reason is a fear by environmentalists that discussing possible adaptive measures might undermine the political pressure for mitigation.¹⁰ In my view, this is a mistake. As people learn more about the expense and difficulty of adaptation, they should become more interested in mitigation, not less so. In addition, regardless of mitigation, some climate change is already occurring and will continue to occur before mitigation measures can have any real impact.¹¹ Thus, although adaptation may be less important than mitigation in the grand scheme of things, it is not something we can afford to ignore.

This Article addresses one subsidiary but important question: Who should absorb this cost? Several possible answers to the cost allocation question deserve exploration. We might leave it to the direct beneficiaries of adaptation projects to absorb the costs, or we might shift the costs to the entities that emitted greenhouse gases.

6. *Id.*

7. *Id.* at 1446.

8. Nothing in this Article should be taken as detracting from the importance of implementing appropriate controls on greenhouse gases as soon as possible. Adaptation is not a substitute for mitigation—indeed, without mitigation, adaptation may cease to be achievable, and there will inevitably be harms, such as species extinction, that cannot be prevented through adaptation.

9. See *infra* text accompanying notes 76-80 for some cost estimates.

10. AMY LYND LUERS & SUSANNE C. MOSER, CAL. CLIMATE CHANGE CTR., PREPARING FOR THE IMPACTS OF CLIMATE CHANGE IN CALIFORNIA: OPPORTUNITIES AND CONSTRAINTS FOR ADAPTATION 9 (2006).

11. *Id.* at 2.

Alternatively, we might let taxpayers foot the bill or require regions that experience benefits from climate change to fund adaptation. Which alternative to prefer is not an easy question. The choice involves a complex mix of judgments about incentives and difficult normative issues regarding moral desert and social solidarity.

The primary purpose of this Article is to explore these issues rather than advocate a solution. My tentative conclusion, however, is that “Emitters Pay” is the most attractive of the potential allocation principles, while “Climate Change Winners Pay” is the least compelling. Different types of adaptation at various times and places may be suited for different mixes of allocation principles.

Part II of this Article explores the challenges of adaptation. After addressing lingering doubts about the reality of human-caused climate change, Part II surveys the negative effects of climate change. Thinking about adaptation has not advanced as far as thinking about mitigation of climate change (a/k/a prevention), but it is already clear that billions of dollars will be involved.

Part III turns to the question of cost allocation. I will begin by teasing out some of the relevant social goals. I will then consider four possible cost allocation principles: “Beneficiaries Pay,” “Emitters Pay,” “Public Pays,” and “Winners Pay.” These principles do not cover the universe of possibilities, but they seem to be the most plausible and provide more than enough complications for now. Part III suggests that the preferred principle should be “Emitters Pay” but that cost allocations between taxpayers and beneficiaries (“Public Pays” plus “Beneficiaries Pay”) may also have a role.

The Article closes in Part IV with some thoughts about the climate change debate and prospects for a reasonable cost allocation scheme. Where politics are concerned, predictions are always hazardous, and the idealist is apt to look silly in retrospect.

Why care about allocation? Isn’t mitigation more important than adaptation? And isn’t what we order for dinner at the Climate Response Café a lot more important than who pays the tab? As to the first question, what we do in terms of mitigation will have a greater impact on future generations. Yet infrastructure decisions made today may still be important decades from now, and how we adapt will have more direct effect in the near term than mitigation efforts. In short, mitigation is critical to the welfare of later generations, while adaptation is critical to our own generation and that of our children.

As to the second question, who pays the tab may be very important. Certainly, it should be regarded as important by lawyers,

who are often in the position of arguing about financial responsibility after the fact. It is also important because choosing the wrong cost allocation scheme for adaptation might undermine mitigation efforts by diverting needed funding to adaptation projects, or it might lead to investment in ill-advised adaptation projects. Allocating adaptation costs is also important to the extent that we believe moral as well as practical issues are involved in determining responsibility for climate change impacts. Finally, a sound cost allocation system may make it easier to overcome the collective action problems involved in climate change adaptation, such as the risk of rent-seeking by beneficiaries of adaptation. If at least a default rule can be established for payment for adaptation, negotiations on which adaptation measures to adopt will be simplified.

Most importantly, we should start thinking about cost allocation now because very soon the world is going to start doing so. As the realization sinks in that climate change will cause billions of dollars of harm even if we do everything feasible to cut back on emissions, the people who are directly harmed are going to start wondering whether they alone should bear the costs. It behooves us as scholars and lawyers to begin thinking through the issues before they reach the front pages of the newspaper.

II. THE CHALLENGE OF ADAPTATION

We begin with some basic questions: Is climate change real? Will it have serious effects? Will it be expensive to cope with those effects after they transpire? As we will see, the answer to all three questions is the same—yes.

A. The Reality of Climate Change

How sure can we be that climate change is a genuine threat? The most reliable source is the Intergovernmental Panel on Climate Change's (IPCC) 2007 report, which explains the scientific consensus that:

Global atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years. The global increases in carbon dioxide concentration are due primarily to fossil fuel use and land-use

change, while those of methane and nitrous oxide are primarily due to agriculture.¹²

If this report is wrong, it is not for lack of adequate discussion and feedback. The IPCC report is the result of an exhaustive review process:

Forty governments nominated the 150 lead authors and 450 contributing authors of *Climate Change 2007: The Physical Science Basis*. . . . Authors had their draft chapters reviewed by all comers. More than 600 volunteered, submitting 30,000 comments. Authors responded to every comment, and reviewers certified each response. With their final draft of the science in hand, authors gathered in Paris, France, with 300 representatives of 113 nations for 4 days to hash out the wording of a scientist-written Summary for Policymakers.¹³

Because of improvements in modeling and data, the 2007 Report was able to eliminate some concerns previously raised about climate change. In particular, four key issues were resolved:

- The “urban heat island effect,” caused by the tendency of urban concrete and asphalt to absorb heat, is real, but “a negligible influence” on overall temperature.
- The previous discrepancy between earth-based and satellite-based temperature measurements has been resolved by improved satellite measurements, which are more in line with the earth-based results.

12. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS: SUMMARY FOR POLICYMAKERS: CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT 2 (2007) [hereinafter *IPCC*] (citations omitted). The IPCC explains that “[t]he understanding of anthropogenic warming and cooling influences on climate has improved since the Third Assessment Report (TAR), leading to *very high confidence* that the globally averaged net effect of human activities since 1750 has been one of warming, with a radiative forcing of +1.6 [+0.6 to +2.4] W m⁻².” *Id.* at 5 (alteration in original) (footnote omitted).

13. Richard A. Kerr, *Scientists Tell Policymakers We’re All Warming the World*, 315 SCI. 754, 754 (2007).

- Natural forces such as volcanoes and variations in solar intensity can influence climate and have done so in the past, but these natural variations could not produce the currently observed patterns of climate change.
- Evidence shows that the climate system is sufficiently sensitive to atmospheric composition to produce the observed climate change, as shown by the response to other disturbances such as the Mount Pinatubo eruption of 1991.¹⁴

Of course, complete scientific certainty is never possible, and the IPCC claims only that its conclusions are highly likely (over 90%).¹⁵ But social policy can never be based on complete certainty. The current evidence on climate change is the result of an intensive, international scientific effort. The IPCC process is imperfect but a good representation of the current state of the science;¹⁶ if anything, the process tends to underplay risks.¹⁷ To demand complete certainty is quixotic: governments, firms, and individuals have to make the best decisions they can today on the basis of

14. *Id.* at 755.

15. *Id.* at 754.

16. As the New York Times recently explained:

The panel, which has tracked research on global warming since it was created under United Nations auspices in 1988, has sometimes been criticized for allowing governments to shape the summaries of its periodic reviews of climate science.

But by many accounts, it remains the closest thing to a barometer for tracking the level of scientific understanding of the causes and consequences of global warming.

James Kanter & Andrew C. Revkin, *Scientists Detail Climate Changes, Poles to Tropics*, N.Y. TIMES, Apr. 7, 2007, at A6.

17. For example, political leaders insisted on weakening language about the stringency of climate change impacts in the most recent IPCC report:

The meeting here dragged on in a marathon session Thursday night before Dr. Pachauri emerged midmorning on Friday and stood on a blue armchair in front of reporters to announce that agreement had been reached between scientists and government officials over the final details of a 21-page summary.

Under pressure from nations including Russia, China and Saudi Arabia, the authors said, sections on coral damage and tropical storms were softened in the summary. They also got the authors to drop parts of an illustration showing how different emissions policies might limit damage. Officials from those countries argued that data in the report did not support the level of certainty expressed in the final draft.

But some authors were not assuaged. The final document was "much less quantified and much vaguer and much less striking than it could have been," said Stéphane Hallegatte, a participant from France's International Center for Research on the Environment and Development.*Id.*

available information.¹⁸

In considering loss allocation, we should keep in mind that our legal system has never demanded anything close to certainty as a basis for shifting losses. The plaintiff in an ordinary tort case need only prove by a preponderance of evidence that the defendant bears responsibility for the loss. Thus, even the common law requires only a showing that reallocation is justified “more likely than not.” In terms of the existence of climate change and the linkage to human activity, we seem to be well past that point today. Even those who are skeptical of the need to mitigate greenhouse gases should be willing to accept that adaptation measures are a reasonable precaution, and this inescapably raises the question of who should pay the resulting costs.

B. Climate Change Impacts

The question of mitigation is beyond the scope of this Article. Mitigation may affect the degree of adaptation that is ultimately required, but in the short run it will have little effect. The reality is that, whatever mitigation measures are adopted, a significant degree of climate change seems unavoidable.¹⁹ As the IPCC ex-

18. Some of those decisions will necessarily involve investments now in infrastructure, some of which might turn out to be unnecessary if the climate change problem turns out to be less serious than we now believe. If we shift those costs to emitters or beneficiaries of adaptation, and the costs later turn out to be unnecessary, would we have committed an injustice? In my opinion the answer is no. Risks create real costs even when the risk does not materialize, and rules reallocating those costs do not retroactively become unjust when the existence of the risk is disproved. Suppose a person is in an accident due to a tortfeasor's negligence. If a doctor gives a precautionary tetanus shot, he can charge for the service. In turn, the victim can sue the tortfeasor for the expense. Suppose we later learn that the victim was not in fact exposed to any tetanus bacilli. That discovery surely would not be a basis for refund from the tortfeasor to the victim or from the victim to the tortfeasor.

19. As described in Donald A. Brown, *The U.S. Performance in Achieving Its 1992 Earth Summit Global Warming Commitments*, 32 ENVTL. L. REP. 10741, 10756 (2002):

Many scientists and policy makers believe that a doubling of CO₂ from pre-industrial levels to 560 ppm may be unavoidable in [the] 21st century. This is so because the world's political and economic system cannot respond rapidly enough to make faster changes in some major polluting sources such as gasoline-powered automobiles or coal-fired power plants. Some environmentalists, however, believe it is still possible to stabilize GHG at 450 ppm, a level that would limit the temperature increase (in addition to that which has already been caused by human activities) to 1.5 to 2 degrees F [] during the next 100 years. Virtually nobody believes that it is possible to stabilize atmospheric concentrations below 450 ppm and concentrations could continue growing after that if third world countries do not implement aggressive reduction strategies, even if the most ambitious proposal currently under consideration were adopted. Even if all nations could have stabilized emissions in the year 2002, the concentrations of GHGs would continue to rise and would approach 500 ppm by the year 2100. After that, GHG concentra-

plains, “[a]nthropogenic warming and sea level rise would continue for centuries due to the timescales associated with climate processes and feedbacks, even if greenhouse gas concentrations were to be stabilized.”²⁰

The best current estimate is that a doubling of CO₂ from pre-industrial levels would result in a temperature increase between 1.5°C and 4.5°C (1.8 to 5.4 °F) by the end of this century.²¹ For this reason, even in the best-case scenario, we will be faced with a number of adverse impacts from climate change. Indeed, we may already be experiencing them.

Examples of observed changes caused by human releases of GHG include shrinkage of glaciers, thawing of permafrost, later freezing and earlier break-up of ice on rivers and lakes, lengthening of mid-to high-latitude growing seasons, poleward and altitudinal shifts of plants and animal ranges, declines of some plant and animal populations, and earlier flowering of trees, emerging of insects, and egg-laying in birds.²²

Climate changes will cause net global losses, but losses will not fall evenly everywhere in the world. A postscript to the Stern report points out that “[a]t 1-2°C of temperature rise, there will be some winners and some losers. Longer growing seasons in northern latitudes, and reduced mortality from winter cold snaps, will create economic gains in some areas and opportunities for new activities including in the agriculture, energy and tourism sectors in some regions.”²³ Cass Sunstein reports estimates that a 2.5 °C increase could cost India almost 5% of GDP but China only about

tions in the atmosphere would continue to rise for several hundred years before stabilization would be achieved. Even to stabilize CO₂ at 1,000 ppm will require reductions of emissions below current levels.

(footnotes omitted).

20. IPCC, *supra* note 12, at 17.

21. See Richard A. Kerr, *Latest Forecast: Stand By for a Warmer, But Not Scorching, World*, 312 SCI. 351 (2006). For an up-to-date source of information on climate science, see RealClimate Home Page, <http://www.realclimate.org> (last visited Nov. 18, 2007).

22. Brown, *supra* note 17, at 10756 (footnotes omitted). For further details on climate change effects in the United States, see CAMILLE PARMESAN & HECTOR GALBRAITH, PEW CTR. ON GLOBAL CLIMATE CHANGE, OBSERVED IMPACTS OF GLOBAL CLIMATE CHANGE IN THE U.S. 1 (2004), available at http://www.pewclimate.org/docUploads/final_ObsImpact.pdf.

23. After the Stern Review: Reflections and Responses: Paper A: The Case for Action to Reduce the Risks of Climate Change 6 (Feb. 12, 2007) (unpublished paper, on file with the Stern Review), available at http://www.hm-treasury.gov.uk/media/9/C/stern_yalea091107.pdf.

.2%.²⁴ Africa would lose almost 4%, which is particularly alarming given the region's current economic situation.²⁵

Sea level rise is one of the most predictable consequences of climate change.²⁶ Apart from the unknown contribution of melting from Greenland and Antarctica,²⁷ the simple change in temperature of the oceans will contribute to thermal expansion, just as increased temperature causes the mercury in a thermometer to rise.²⁸ As the IPCC explains, "[o]bservations since 1961 show that the average temperature of the global ocean has increased to depths of at least 3000 m and that the ocean has been absorbing more than 80% of the heat added to the climate system. Such warming causes seawater to expand, contributing to sea level rise."²⁹ Moreover, the IPCC reports that "[m]ountain glaciers and snow cover have declined on average in both hemispheres. Widespread decreases in glaciers and ice caps have contributed to sea level rise (ice caps do not include contributions from the Greenland and Antarctic ice sheets)."³⁰ Sea level rise is at the opposite end of the scale from being speculative.³¹

24. Cass R. Sunstein, *Of Montreal and Kyoto: A Tale of Two Protocols*, 31 HARV. ENVTL. L. REV. 1, 48 fig.7 (2007).

25. *Id.*

26. See, e.g., K. Hasselman et al., *The Challenge of Long-Term Climate Change*, 302 SCI. 1923, 1924 fig.1 (2003) (predicting a two meter increase in sea level under a "business-as-usual" scenario by 2100, but only twenty centimeters under an optimum regulatory strategy). The effects of sea level rise are discussed in more detail in Susanne C. Moser, *Climate Change and Sea-Level Rise in Maine and Hawai'i: The Changing Tides of an Issue Domain* 201, in GLOBAL ENVIRONMENTAL ASSESSMENTS (Ronald B. Mitchell et al. eds., 2006).

27. On the potential for catastrophic melting in these areas, see NICHOLAS STERN, THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW 20 box 1.4 (2007). The IPCC reports simply that "[d]ynamical processes related to ice flow not included in current models but suggested by recent observations could increase the vulnerability of the ice sheets to warming, increasing future sea level rise. Understanding of these processes is limited and there is no consensus on their magnitude." IPCC, *supra* note 11, at 17. However, the IPCC also reports that uncontrolled warming could have dramatic consequences:

Contraction of the Greenland ice sheet is projected to continue to contribute to sea level rise after 2100. Current models suggest ice mass losses increase with temperature more rapidly than gains due to precipitation and that the surface mass balance becomes negative at a global average warming (relative to pre-industrial values) in excess of 1.9 to 4.6°C. If a negative surface mass balance were sustained for millennia, that would lead to virtually complete elimination of the Greenland ice sheet and a resulting contribution to sea level rise of about 7 m. The corresponding future temperatures in Greenland are comparable to those inferred for the last interglacial period 125,000 years ago, when paleoclimatic information suggests reductions of polar land ice extent and 4 to 6 m of sea level rise. *Id.*

28. Changes in ocean temperature will also affect fish stocks. See Hans O. Pörtner & Rainer Knust, *Climate Change Affects Marine Fishes Through the Oxygen Limitation of Thermal Tolerant*, 315 SCI. 95 (2007).

29. IPCC, *supra* note 12, at 7 (citation omitted).

30. *Id.*

31. For more scientific background on the issue, see Stefan Rahmstorf, *A Semi-Empirical Approach to Projecting Future Sea-Level Rise*, 315 SCI. 368 (2007); Andrew Shepherd & Duncan Wingham, *Recent Sea-Level Contributions of the Antarctic and Greenland Ice Sheets*, 315 SCI. 1529 (2007).

This rise in sea level will result in loss of coastal lands,³² inundation of some estuary systems with salt water, salt water intrusions into some drinking sources, and increased exposure to flood damage.³³ Sea level change may have drastic effects on island populations.³⁴ For example, the small island state of Tuvalu is seeking ways to evacuate its entire population.³⁵

Sea level rise could also cause dramatic losses in the wetlands in the United States.³⁶ Because the slope of coastal areas on the Atlantic and Gulf Coasts is low, a forty centimeter rise in sea level could result in as much as sixty meters of beach erosion and cost in the billions of dollars.³⁷ As I discuss later, this emphatically applies to Florida. To get a sense of the potential economic impact, consider the following estimates regarding sea level rise: A half-meter sea level rise would place \$185 billion of property in jeopardy by 2100, and the cost of protecting developed areas from a half-meter rise would be \$50 to \$66 billion.³⁸

Summarizing the most recent data, the IPCC's Fourth Assessment says:

Coasts are projected to be exposed to increasing risks, including coastal erosion, due to climate change and sea-level rise and the effect will be exacerbated by increasing human-induced pressures on coastal areas.

Corals are vulnerable to thermal stress and have low adaptive capacity. Increases in sea surface temperature of about 1 to 3°C are projected to result in more frequent coral bleaching events and widespread

32. See A. BARRIE PITTOCK, *CLIMATE CHANGE: TURNING UP THE HEAT* 262-82 (2005) for examples, including China, India, Pakistan, Bangladesh, and the United States.

33. See ELIZABETH KOLBERT, *FIELD NOTES FROM A CATASTROPHE: MAN, NATURE, AND CLIMATE CHANGE* 123-24 (2006) (reporting that what are now hundred-year floods could become routine by late in this century) see also PITTOCK, *supra* note 32, at 118 box 5 (stating that without adaptive measures, annual flood losses would increase from £1 to 27 billion in different scenarios).

34. See Denis Culley, Comment, *Global Warming, Sea Level Rise and Tort*, 8 OCEAN & COASTAL L.J. 91, 105-07 (2002).

35. *Id.* at 92-93, 106.

36. *Id.* at 100.

37. David A. Grossman, *Warming up to a Not-So-Radical Idea: Tort-Based Climate Change Litigation*, 28 COLUM. J. ENVTL. L. 1, 12-14. (2003).

38. WILLIAM E. EASTERLING III ET AL., PEW CTR. ON GLOBAL CLIMATE CHANGE, *COPING WITH GLOBAL CLIMATE CHANGE: THE ROLE OF ADAPTATION IN THE UNITED STATES* 14 (2004), available at <http://www.pewclimate.org/docUploads/Adaptation.pdf>. This estimate may be on the high side, but even if we discount by a factor of two, the figures are still impressive.

mortality, unless there is thermal adaptation or acclimatisation by corals.

Coastal wetlands including salt marshes and mangroves are projected to be negatively affected by sea-level rise especially where they are constrained on their landward side, or starved of sediment.

Many millions more people are projected to be flooded every year due to sea-level rise by the 2080s. Those densely-populated and low-lying areas where adaptive capacity is relatively low, and which already face other challenges such as tropical storms or local coastal subsidence, are especially at risk. The numbers affected will be largest in the megadeltas of Asia and Africa while small islands are especially vulnerable.³⁹

The IPCC assessment also notes that in North America,

[c]oastal communities and habitats will be increasingly stressed by climate change impacts interacting with development and pollution. Population growth and the rising value of infrastructure in coastal areas increase vulnerability to climate variability and future climate change, with losses projected to increase if the intensity of tropical storms increases. Current adaptation is uneven and readiness for increased exposure is low.⁴⁰

Increased ocean temperatures lead not only to sea level rise but also to an increased risk of damage from storms. Stern explains the connection:

Infrastructure damage costs will increase substantially from even small increases in sea temperatures because: (1) peak wind speeds of tropical storms are a strongly exponential function of temperature, increasing by about 15 - 20% for a 3°C increase in

39. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: CLIMATE CHANGE IMPACTS, ADAPTATION AND VULNERABILITY: SUMMARY FOR POLICYMAKERS: WORKING GROUP II CONTRIBUTION TO THE IPCC FOURTH ASSESSMENT REPORT 9 (2007) [hereinafter *IPCC Adaptation Report*] (citations omitted).

40. *Id.* at 13.

tropical sea surface temperatures; and (2) damage costs typically scale as the cube of wind-speed or more. Storms and associated flooding are already the most costly natural disaster today, making up almost 90% of the total losses from natural catastrophes in 2005 (\$184 billion from windstorms alone, particularly hurricanes and typhoons). A large proportion of the financial losses fall in the developed world, because of the high value and large amount of infrastructure at risk.⁴¹

The IPCC agrees that “[i]t is *very likely* that hot extremes, heat waves, and heavy precipitation events will continue to become more frequent.”⁴² The IPCC also concurs that we are likely to see changes in tropical storms such as hurricanes:

Based on a range of models, it is *likely* that future tropical cyclones (typhoons and hurricanes) will become more intense, with larger peak wind speeds and more heavy precipitation associated with ongoing increases of tropical SSTs. There is less confidence in projections of a global decrease in numbers of tropical cyclones. The apparent increase in the proportion of very intense storms since 1970 in some regions is much larger than simulated by current models for that period.

Extra-tropical storm tracks are projected to move poleward, with consequent changes in wind, precipitation, and temperature patterns, continuing the broad pattern of observed trends over the last half-century.⁴³

According to the Stern Report, “[c]hanges in rainfall patterns and extreme weather events will lead to more severe impacts on people than that caused by warming alone.”⁴⁴ There are strong indications that climate change may lead to much more severe droughts in some regions.⁴⁵ The IPCC confirms that

41. STERN, *supra* note 27, at 92-93 (footnotes omitted).

42. IPCC, *supra* note 12, at 16.

43. *Id.*

44. STERN, *supra* note 27, at 17.

45. See Kolbert, *supra* note 33, at 108-18; Carl T. Hall, *Global Warming Study Forecasts More Water Shortages: Climate Change Already Affecting Sierra Snowpack*, SAN FRANCISCO CHRON., Nov. 17, 2005, at A4; Richard M. Adams & Dannele E. Peck, *Drought And Climate Change: Implications for The West 1* (Dec. 2002) (unpublished manuscript, on

[l]ong-term trends from 1900 to 2005 have been observed in precipitation amount over many large regions. Significantly increased precipitation has been observed in eastern parts of North and South America, northern Europe and northern and central Asia. Drying has been observed in the Sahel, the Mediterranean, southern Africa and parts of southern Asia.⁴⁶

Many areas rely on single-source water systems that are “extremely sensitive” to climate.⁴⁷ Severe stress on water supplies is also a possibility in some parts of the world, such as Africa and the Middle East,⁴⁸ as well as Australia.⁴⁹ In California, the state water agency is devoting major attention to the impact of climate change on the state’s water supply.⁵⁰ Increases in flooding are also likely to be significant in some areas.⁵¹ It may be difficult to tie any one year of drought or a particular flood to climate change, but dealing with these threats will clearly involve significant challenges.

Some natural systems react particularly strongly to temperature changes.⁵² There is considerable evidence that coral reefs have been adversely affected by climate change.⁵³ The Florida connection will be addressed later. At the other climatic extreme, glaciers and areas of tundra are being heavily impacted. Almost a quarter of the land in the Northern Hemisphere is situated on permafrost, much of which seems to be melting rapidly.⁵⁴ Arctic

file with the Or. State Univ. Dep’t of Agric. & Res. Econs.), *available at* http://www.economics.noaa.gov/library/documents/benefits_of_weather_and_climate_forecasts/drought-climate_change-implications_for_west.doc; Michael McCarthy, *The Century of Drought*, INDEP. (U.K.), Oct. 4, 2006, *available at* <http://environment.independent.co.uk/article1786829.ece>.

46. IPCC, *supra* note 12, at 8 (footnote omitted).

47. Kenneth D. Frederick, *Water Resources and Climate Change*, in CLIMATE CHANGE ECONOMICS AND POLICY 67, 68-69 (Michael A. Toman ed., 2001).

48. Pittock, *supra* note 32, at 253-54. Note also that “[p]otential increases in the frequency and intensity of drought across subhumid Africa are likely to increase desertification.” *Id.* at 255.

49. *Id.* at 257. China may be vulnerable to drought increases as well. *Id.* at 263.

50. See California Department of Water Resources, *Climate Change in California* (2007), *available at* <http://www.water.ca.gov/climatechange/docs/062807factsheet.pdf>.

51. For the most up to date information on how climate change will affect severe weather events, see <http://www.ncdc.noaa.gov/oa/climate/research/monitoring.html> (last visited Dec. 8, 2007).

52. In addition to the items discussed here, increases in wildfires may be another, similar form of damage. See A.L. Westerling et al., *Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity*, 313 SCI. 940 (2006).

53. See Culley, *supra* note 34, at 95.

54. Kolbert, *supra* note 33, at 13-15. Some of these changes may be augmented by

Sea ice is also shrinking at a surprising rate.⁵⁵

What does this mean for Florida? Permafrost is not the problem, to say the least. But Florida is nonetheless vulnerable. A recent report from the Florida Center for Environmental Studies explains that “[a]ll of Florida will be impacted by sea level rise, changes in hurricane frequency and intensity, changes in the intensity of flood and drought, and temperature increase,” with ripple effects on “flora and fauna, agriculture, economy, and lifestyle.”⁵⁶ North Florida has a very flat coastal area and water allocation issues with neighboring states that may be intensified by stream flow changes.⁵⁷ Central Florida’s agriculture and tourism may be impacted, and hurricane threats to Tampa and elsewhere are a concern.⁵⁸ South Florida may be particularly vulnerable, facing threats to freshwater aquifers, changes in coastal areas, and impacts on the Everglades.⁵⁹ In addition, the impact on Florida’s coral reefs is obviously a concern.⁶⁰

In the really long run, sea-level change may be the biggest threat to Florida. From the Jurassic Era, when dinosaurs still walked the earth, until the last interglacial melt, South Florida was generally sea bottom.⁶¹ It is not hard to imagine that the situation might revert in future centuries to the geologically “normal,” with Miami taking the place of Atlantis in mythology. Less dramatically but still seriously enough, much of Florida may someday find itself repeating the fate of the Louisiana coast.⁶²

climate fluctuations rather than long-term trends. See Richard A. Kerr, *Could Mother Nature Give the Warming Arctic a Reprieve?*, 315 SCI. 36 (2007) (reporting that current warming trends may in part reflect natural variability rather than long-term warming).

55. Kolbert, *supra* note 33, at 25.

56. FLA. CTR. FOR ENVTL. STUDIES, PRACTICAL ISSUES RELATED TO CLIMATE CHANGE IN FLORIDA: A WORKSHOP ON NEEDS ASSESSMENT AND RESPONSES: SUMMARY REPORT 5 (2006), available at http://www.ces.fau.edu/ccc/FL_CLIMATE_CHANGE.pdf.

57. *Id.* at 5-6.

58. *Id.* at 6.

59. *Id.* at 7.

60. The National Wildlife Federation (NWF) maintains that:

As much as 90 percent of the region’s coral reefs are dead or dying due to a host of factors, including global warming. An increase in average sea temperatures over the past 30 years has caused widespread coral bleaching, where corals lose the colorful algae in their tissues that they need to survive.

Nat’l Wildlife Fed’n, *Global Warming and Florida* 1 (2007), available at <http://111.nwf.org/globalwarming/pdf/Florida.pdf>. The NWF also reports that habitat and wildlife losses could have a significant economic impact, since almost five million people spent around six billion dollars annually on wildlife-related activities in Florida. *Id.* at 2.

61. MICHAEL GRUNWALD, *THE SWAMP: THE EVERGLADES, FLORIDA, AND THE POLITICS OF PARADISE* 15 (2006).

62. Consider the account of a visitor to a Cajun community:

I can almost hear the Gulf breakers just beyond sight, getting closer and closer, washing away more land every second, every minute, every hour, fifty acres every day.

Short of such long-term disaster scenarios, there is still plenty of reason to worry about sea level change.

The Century Commission for a Sustainable Florida, in its first annual report to the Governor and the Legislature this year, summarizes some of the expected impacts of warming on Florida.⁶³ The Commission estimates that a thirty inch increase in sea levels over the next century would translate into a four hundred foot inward move of the shoreline, with serious effects on the state.⁶⁴ About a third of the state's ocean beaches and two-thirds of its estuarine beaches could disappear, and the lower Everglades could be completely drowned.⁶⁵ In turn, salt water intrusions into the Everglades will contaminate the Biscayne aquifer, a key water source for all of south Florida.⁶⁶ Coastal cities will face huge costs because of flood risks.⁶⁷ Given that about fifteen out of every sixteen Floridians live within thirty-five miles of the coast,⁶⁸ sea level rise and increased hurricane surges are obviously a major concern for most of the population. Unfortunately, Floridians are moving to the coast in ever greater numbers, placing themselves and their property at risk.⁶⁹

Over the long run, mitigation is the key to getting these impacts under control. But in the short run, sea level rise seems nearly inevitable, along with other climate-driven changes affecting Florida and other places. What we cannot prevent through

"I'm a fisherman, me, like my daddy and granddaddy," Wayne [a Cajun] tells me. "But de marsh, he's killin' us. He just won't hold together anymore. We'll all be leavin' here soon, just like de ducks in de spring, everybody moving on."

MIKE TIDWELL, *BAYOU FAREWELL: THE RICH LIFE AND TRAGIC DEATH OF LOUISIANA'S CAJUN COAST* 7 (2003). When he returned less than a year later to Louisiana, Tidwell could already see changes:

On the drive into town that morning I passed the Leeville cemetery, the one by the bridge, and was startled to see only eight crypts still visible above the water. By my count, the crumbling remains of at least four tombs, all barely above water when I visited here the year before, were now gone. Completely submerged. With just ten months separating my two visits, I'm already a veteran witness of Louisiana land loss, equipped with my own startling anecdote to tell: "Why, I remember when a full quarter of the Leeville cemetery was still above water and you could see . . ." *Id.* at 82-83.

63. CENTURY COMM'N FOR A SUSTAINABLE FLA., *FIRST ANNUAL REPORT TO THE GOVERNOR AND THE LEGISLATURE* 3 (2007).

64. *Id.* at 62. Even a fifteen inch increase would inundate half of the state's salt marshes and over three-quarters of its tidal flat. *Id.* at 64.

65. *Id.* at 62.

66. *Id.* at 63.

67. *Id.* at 62.

68. *Id.*

69. A dramatic illustration is found in a graph of coastal population over time in STEPHEN LEATHERMAN, INT'L HURRICANE RESEARCH CTR., *SEA LEVEL RISE AND COASTAL IMPACTS* 37 (2007), available at <http://www.floridacclimatechange.com/images/StephenLeathermanSeaLevelRise.pdf>.

mitigation, we must try to adapt to as well as we can.

C. Adaptation Measures

Adaptation has not received nearly as much attention as mitigation, but we can already begin to see the outlines of adaptation needs. Of course, the scale of adaptation needed is related to the degree of mitigation: if we do nothing to limit emissions, climate change will be more drastic and the costs of adaptation will be correspondingly higher. The IPCC notes that adaptation covers a wide spectrum of responses:

The array of potential adaptive responses available to human societies is very large, ranging from purely technological (e.g., sea defences), through behavioural (e.g., altered food and recreational choices) to managerial (e.g., altered farm practices), to policy (e.g., planning regulations). While most technologies and strategies are known and developed in some countries, the assessed literature does not indicate how effective various options are to fully reduce risks, particularly at higher levels of warming and related impacts, and for vulnerable groups. In addition, there are formidable environmental, economic, informational, social, attitudinal and behavioural barriers to implementation of adaptation. For developing countries, availability of resources and building adaptive capacity are particularly important.⁷⁰

Few of these measures are costless, and some may turn out to be quite expensive.

The Pew Foundation collected much of the available information about adaptation strategies in a 2004 report.⁷¹ One conclusion is that we will need to develop new agricultural plant varieties to deal with changing temperatures, rainfall, and pests. Since 1980, federal expenditures for agricultural research have been flat,⁷² but substantial increases will probably now be needed. Farmers will have to make risky decisions about when the climate has changed enough to justify switching to new varieties and growing methods.⁷³ Agricultural production is likely to shift north-

70. *IPCC Adaptation Report*, *supra* note 39, at 18 (footnotes omitted).

71. Easterling et al., *supra* note 38.

72. *Id.* at 20.

73. *See id.*

ward,⁷⁴ perhaps not good news for Florida. Other areas where adaptation may be required include forestry, health hazards from heat stress, and conservation management.⁷⁵

The Stern Report contains the most extensive discussion of adaptation costs. The Report estimates that

[i]nfrastructure is particularly vulnerable to heavier floods and storms, in part because OECD economies invest around 20% of GDP or roughly \$5.5 trillion in fixed capital each year, of which just over one-quarter typically goes into construction (\$1.5 trillion - mostly for infrastructure and buildings). The additional costs of adapting this investment to a higher-risk future could be \$15 — 150 billion each year (0.05 — 0.5% of GDP), with one-third of the costs borne by the US and one-fifth in Japan. This preliminary cost calculation assumes that adaptation requires extra investment of 1 — 10% to limit future damages from climate change.⁷⁶

In Britain alone, one “study estimated that a cumulative increase in investment of \$18 — 56 million (£10 — 30 million) each and every year for the next 80 years would be required to prevent the costs of flood damages escalating in the UK.”⁷⁷ As an example of possible infrastructure needs, consider the risks to London:

Flooding would cause immense disruption to London’s commercial activities, and could cause direct damage equivalent to around £50 billion (plus wider financial disruption). Climate change could increase the maintenance costs of flood defences in the Thames over 100 years from £3.8 billion without climate change (£1.1 billion, Green Book discounted) to £5.3 — £6.8 billion (£1.9 - £2.8 billion, Green Book discounted) with climate change. . . . The design of the [Thames] Barrier allowed for sea level rise but did not make any specific allowance for changes in river flows or the height of North Sea storm surges. . . . After [2030], the risk increases, potentially reaching 1-in-50 years by the end of the century without

74. *Id.* at 21.

75. *Id.* at 3 tbl.1.

76. STERN, *supra* note 27, at 473 (footnote omitted).

77. *Id.*

any active intervention to upgrade capital defences.⁷⁸

Stern also reports some very preliminary efforts regarding the cost of adaptation in the developing world:

The most recent estimates come from the World Bank that show the additional costs of adaptation alone as \$4-37 billion each year. This includes only the cost of adapting investments to protect them from climate-change risks, and it is important to remember that there will be major impacts that are sure to occur even with adaptation. The World Bank estimate is based on an examination of the current core flows of development finance, combined with very rough estimates of the proportion of those investments that is sensitive to climate risk and the additional cost to reduce that risk to account for climate change (5-20% as a very rough estimate).⁷⁹

Another estimate, covering only the least developed countries and the short term, is over a billion dollars for the most urgently needed adaptation measures.⁸⁰

The cost of adaptation may or may not be large in comparison with the total world economy, but that comparison will not be relevant to localities that need billions of dollars worth of expenditures for climate change adaptation. One of the safer predictions about the impact of climate change is that the debate over who will bear those costs is likely to become quite heated.

III. WHO SHOULD PAY?

Either society will invest in adaptation, or the effects of climate change will be even worse than they need to be. We can all hope for the first of these alternatives. But to say that "society" will invest is to gloss over a key question: at the end of the day, who should bear the cost? To address that question, we must first consider the possible norms that might cover the choice of an allocation system and then examine the primary alternative allocation schemes in light of those norms.

78. *Id.* at 479 box 19.3.

79. *Id.* at 502 (footnotes omitted).

80. *Id.* at 504.

A. *Applicable Norms*

The tort system—and by extension, other loss allocation schemes—has several goals.⁸¹ Probably the two most important goals are deterring harmful conduct (the efficiency or deterrence rationale) and corrective justice (restoring moral balance by rectifying harm). Loss distribution (which can be considered a way of providing insurance against social risks) is another goal, perhaps more important in social compensation schemes than in tort.⁸² A final set of goals is oriented towards maintaining societal cohesion—providing redress for social grievances or exhibiting social solidarity with victims.⁸³

It is helpful to group the possible goals for a loss allocation system under four headings: behavioral effects, loss-spreading, concepts of just deserts, and distributive.

1. *Behavioral goals*

One goal of a loss allocation scheme is to deter the behavior that causes the losses. We would hope, for example, that medical malpractice liability causes doctors to be more careful or that toxic tort liability leads to fewer exposures to toxic substances. Clearly, we would like to provide an incentive to reduce emissions of greenhouse gases in the future, particularly to the extent that an effective regulatory scheme does not exist. This is a standard argument for adopting a prospective rule that imposes liability on harm-causing entities.

Less obviously, there may also be useful incentive effects created by the prospect of retrospective liability. It is obviously impossible to deter conduct that has already taken place. Nevertheless, establishing a rule that requires compensation for past emissions can provide a precedent for future liability schemes that cover other emerging environmental harm. For example, the fear that another country might emulate CERCLA (the Comprehensive Environmental Response Compensation and Liability Act) liability, which imposes retroactive liability on waste generators for clean-up costs at hazardous waste disposal sites, gives companies an incentive to be careful in disposing of hazardous wastes, even if

81. For discussion of these goals, see KENNETH S. ABRAHAM, *THE FORMS AND FUNCTIONS OF TORT LAW* 14-20 (2d ed. 2002).

82. *See id.*

83. For an insightful discussion of this solidarity rationale in the context of catastrophic natural events, see Stephen D. Sugarman, *Roles of Government in Compensating Disaster Victims*, 10 *ISSUES IN LEGAL SCHOLARSHIP* 1 (2007), available at <http://www.bepress.com/ils/iss10/art1/>.

that country does not currently have a stringent regulatory scheme. Thus, the expectation of retroactive liability can provide useful incentives to avoid novel forms of harmful conduct.⁸⁴ In the absence of such a liability threat, when new environmental issues arise, those producing the harms will assume that they have a free ride until a liability scheme that deals specifically with the new problem is put into effect. This would discourage early efforts to reduce harmful conduct.

Thus, a general policy of retroactive liability for environmental harm might have valuable deterrent effects.⁸⁵ Moreover, serious discussion of retroactive loss allocation now could have an immediate deterrent effect on emitters who might otherwise resist reductions. As Louis Kaplow pointed out some twenty years ago in what still may be the leading economic analysis of retroactivity issues,

[s]ometimes new legal rules should be made fully retroactive: they should be applied to time periods before the enactment date, even as to investments no longer in existence. This sort of transition policy is hardly novel. For example, newly announced standards of common law liability are usually applied not merely to investments that continue in existence after the announcement date, even though undertaken earlier, but also to the effects of such actions that result prior to the announcement date.

The incentives analysis developed above favors precisely such retroactive application when the justi-

84. It is also arguable that the liability would not be truly retroactive. As the Restatement drafters note, "the abnormally dangerous doctrine has a significant application in the context of environmental harms," including application to activities such as toxic waste handling that are not at all uncommon in our economy. RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL HARM § 20, at 323-24 (Proposed Final Draft No. 1, 2005). Applying strict liability to production of greenhouse gases arguably could be justified on this basis or on the basis of public nuisance law. See Kenneth P. Alex, *California's Global Warming Lawsuit: The Case for Damages*, in Cliffford Rechtschaffen and Denise Antolini, *Creative Common Law Strategies for Protecting the Environment* (2007). Actually collecting in court may not be feasible because of problems of proof, but nevertheless the legal duty of emitters to avoid harm to the public may already exist.

85. This deterrence rationale has some inherent limitations. The deterrence rationale clearly does not apply before the point when the harmful nature of the conduct could reasonably have been discovered, and it applies with greatest force to activities whose harmful nature has already become clear. Moreover, once an effective regulatory scheme is in place, liability for further emissions may not serve a useful deterrent function, assuming that the regulatory scheme is optimal. But potential liability may provide useful incentives in the period between the discovery of the harmful environmental effect and the implementation of an appropriate regulatory scheme, or as a backup incentive if the regulatory scheme is too weak.

fication for a reform suggests that the prior activity was undesirable. For example, when the government bans a product on the basis of recently completed studies indicating that the product had always been harmful, penalties should also be applied to production prior to the date of the announcement; failure to do so would decrease the incentives for manufacturers to take such risks into account *ex ante*. By contrast, if a new rule were established in response to a change in circumstances, the same reasoning would not support such retroactive application.⁸⁶

A loss allocation scheme can also affect the behavior of those who experience the losses. If those suffering harm are risk averse, a compensation scheme can encourage them to engage in socially desirable behavior by providing a kind of insurance against losses. But loss compensation can also encourage behavior that actually adds to the total losses, a form of moral hazard. A classic example is that fire insurance can cause a reduction in precautions against fire. Similarly, the availability of flood insurance may encourage individuals to build in vulnerable areas if the premiums do not fully reflect the risk. Or, expecting that flood control will be provided, individuals may move into vulnerable areas, forcing the government to invest in flood control that would not otherwise be necessary. And since no flood control system is perfect, the end result may be that more people are in harm's way when the system is overloaded or fails for other reasons.

Related to moral hazard is the issue of rent-seeking. Individuals who might benefit from adaptation measures may pressure the government into investing in mitigation if the cost falls on someone else. Thus, the government might be led to over-invest in adaptation projects that are socially wasteful or at least lower priorities than other possible government expenditures. For example, if the government pays for all flood control projects, local residents will have an incentive to lobby for projects where the benefits to them are outweighed by their costs—a classic form of pork barrel politics.⁸⁷

In addition to its direct effects on economic behavior, any system of loss allocation will involve transaction effects. In some circumstances, the process of reallocating losses may itself have so-

86. Louis Kaplow, *An Economic Analysis of Legal Transitions*, 99 HARV. L. REV. 509, 551-52 (1986) (footnote omitted).

87. Of course, as the Katrina disaster in New Orleans shows, failure to invest in appropriate flood control can also be a terrible mistake.

cial benefits. It may lead to the production of additional useful information, such as a better accounting of the harms caused by climate change or fuller information about which forms of adaptation are desirable. Or the process may provide a sense of fair treatment to those who experience losses. On the other hand, in general, we would prefer to keep transaction costs as low as possible so that social resources are not absorbed by the operation of the loss allocation system. In the extreme case, implementing a loss allocation system might cost society as much as the losses themselves, which is obviously undesirable.

Thus, an ideal loss allocation system would have four behavioral effects. It would induce optimal mitigation of greenhouse gases. At the same time, it would provide a disincentive to inefficient adaptive behavior. It would also counter any behavioral distortions caused by risk aversion among those experiencing losses. Finally, it would minimize the incentive to invest social resources in the operation of the system itself, except where the process results in some socially desirable product other than the loss allocation itself.

2. Loss-spreading

In general, risk averse individuals would prefer a known cost (say, in the form of insurance premiums) to an uncertain loss, even if the expected value of that uncertain loss is greater than the cost of the premiums. The insurance function is probably strongest for the harms caused by extreme weather events such as hurricanes, where the victims' identity is inherently unpredictable. The case for insurance is weaker when harms are more predictable, such as the impact of gradual sea level changes on coastal areas. When harms are completely predictable, however, insurance has no role: everyone who would buy a policy would also collect for the loss, providing no room for loss spreading.

Even when losses are predictable and hence non-insurable, society may have an interest in loss-spreading. Those who come out on the losing side may be a source of social instability if they feel their losses are unfair. Thus, loss-spreading may help to keep social peace. In addition, loss-spreading may represent a form of solidarity toward fellow citizens. We may feel that, even if they are purely the victims of bad luck rather than any culpable activity by the rest of us, we have some duty to assist them. We might envision a kind of social compact in which fellow citizens have undertaken a mutual duty of assistance in the face of mishaps. Such an understanding may underlie our willingness to invest in emer-

agency help for individuals who are stranded in the wilderness or are victimized by natural disasters, even when the expense is far in excess of what we would have paid to prevent the harm in the first place.

Within the United States, there is some argument for expressing solidarity with fellow citizens who are suffering distinct harm because of widespread national practices. Watching the television coverage of Hurricane Katrina, many Americans must have felt a pang that they would not have felt if the event had occurred elsewhere in the world. But for some, a similar sense of solidarity may extend more globally.

The potential social conflicts resulting from climate change also need to be considered. Individuals who suffer loss or displacement due to climate change are likely to be angry and resentful. This effect could be potentially destabilizing in some parts of the world, posing potential threats to international and U.S. security. If the United States is identified as the cause of massive floods or droughts, we can expect the resulting anger to be reflected in increased terrorist threats, potential disruptions to our supply of natural resources, and other harms. Within the United States, effects are likely to be more muted but could still lead to political animosities and polarization. The fact that some states have already filed suit against emitters located elsewhere is an indication of the kind of legal and political demands for compensation that may be made.

3. *Just Deserts*

Corrective justice involves complex moral issues which are not likely to be resolved simply or to everyone's satisfaction.⁸⁸ Emissions of greenhouse gases were not made with the intent to cause harm to others. How culpable was this conduct? At the very least, it seems arguable that, at some point, failure to take reasonable precautionary measures to reduce emissions became negligent. Given the amount of misinformation that has been spread by industry-sponsored groups, as well as possible efforts within the United States government in the past six years to suppress information,⁸⁹ there is also the possibility of deliberate misrepresenta-

88. Matt Adler's analysis suggests that the climate change situation may be an imperfect fit with philosophical theories of corrective justice, although it appears that the philosophical case for compensation at the international level seems stronger than at the local level. Matthew D. Adler, *Corrective Justice and Liability for Global Warming*, 155 U. PA. L. REV. 1859 (2007).

89. For a discussion of the Bush Administration's unprecedented efforts to prevent disclosure of scientific conclusions at odds with its policies, see Robert F. Rich and Kelly R.

tions, as turned out to be the case in the tobacco industry regarding the risk of cigarettes.⁹⁰

The concept of unjust enrichment is another form of just deserts. We might well think that those who have in some sense profited from a situation have some duty to recompense those who have lost out at their expense, particularly when those who have profited have been the cause of the loss. The law of restitution is built around this concept.

The idea of just deserts might also lead us to counter the role of luck with social outcomes. We might think that an individual's welfare should depend on morally relevant facts like effort or moral behavior, rather than on the happenstance of being born with particular genes or living in an area that has the bad luck of being affected by climate change.

If our only goal is social welfare, then just deserts is just a distraction that invites us to look at the past and present when we should be planning for the future. But for many, just deserts has a moral appeal independent of its impact on future welfare. We may feel that the victims of wrongdoing should be compensated by those who are at fault, even if there is no reason to think this will improve the overall welfare of society or provide useful incentives. Not everyone shares this view of social justice, but for those who take this position, just deserts will be an important factor in designing an allocation system.

4. *Distributive and Social Goals*

In formulating any social policy, we may also be influenced by how it effects the distribution of income and wealth, and in particular by whether it hurts or harms the poor. In terms of climate change, the income distribution issue is strongest at the interna-

Merrick, *Use and Misuse of Science: Global Climate Change and the Bush Administration*, 14 VA. J. SOC. POL'Y & L. 223 (2007).

90. At this point, it is impossible to know whether there was a deliberate campaign of deception, but pre-trial discovery in one of the nuisance cases or intensive congressional hearings might shed light on the subject. Given the amount of money to be gained in some industries by forestalling any serious response to climate change, it would not be surprising to learn of deliberate deception of the public or improper pressures on governments. Consider, for example, a petroleum institute memo about a campaign to indoctrinate science students and teachers about the alleged uncertainties of climate research in order to impede efforts such as Kyoto. See Laurie David, *Science a la Joe Camel: An Inconvenient Truth About One American Teachers Association*, SAN FRANCISCO CHRON., Dec. 10, 2006, at C4. Notably, that teachers' association declined to distribute copies of Al Gore's *An Inconvenient Truth* because it considered the film to be "political" and because doing so might imperil the association's capital campaign. Perhaps coincidentally, ExxonMobil had been a strong supporter of the association. *Id.*

tional level, where affluent nations like the United States figure heavily as emitters, and victims are sometimes poorer countries such as Bangladesh. Mitigation responsibilities in international agreements seem to vary inversely with per capita income, which provides some indication of an international consensus in favor of lessening the burden on poorer countries.⁹¹

As the Stern Report says,

[t]he poorest in society are likely to have the least capacity to adapt Given that the greatest need for adaptation will be in low-income countries, overcoming financial constraints is also a key objective. This will involve transfers from rich countries to poor countries. The argument is strongly reinforced by the historical responsibility of rich countries for the bulk of accumulated stocks of GHGs. Poor countries are suffering and will suffer from climate change generated in the past by consumption and growth in rich countries.⁹²

Similarly, the head of an IPCC panel recently said, “[i]t’s the poorest of the poor in the world, and this includes poor people even in prosperous societies, who are going to be the worst hit.”⁹³

Within the United States, distributive effects may be more muted. For instance, some coastal areas, like Louisiana, are relatively poor; others, like California, are relatively affluent. Those who live directly on the coast may be impoverished swamp dwellers or glamorous movie stars. Without sophisticated study of the incidence of climate change generally—and adaptation needs particularly—on different social groups, wealth effects are difficult to ascertain. It does seem clear, however, that some effects of climate change, like heat wave deaths, will fall more heavily on the poor even in the United States, and adaptation measures geared to these effects are a possible target for redistributive policy.

91. See JEFFREY A. FRANKEL, THE BROOKINGS INST., POL’Y BRIEF NO. 52, GREENHOUSE GAS EMISSIONS 4 (1999), available at <http://www.brookings.edu/papers/06energy/frankel.aspx> (reporting that a 1% increase in per capita income implies a 0.1% greater sacrifice).

92. STERN, *supra* note 27, at 42.

93. Kanter & Revkin *supra* note 16 (internal quotations omitted).

B. Four Possible Principles

This Article considers four basic principles that we might adopt to allocate the cost of adaptation. The cost of an adaptation measure could be placed on the beneficiaries of that adaptation measure, on the public (for example, taxpayers), on emitters of greenhouse gases, or on groups that receive net benefits from climate change. Each of the four contains a host of sub-alternatives—for example, the idea that the taxpayers should bear the bill has as many variations as there are possible methods of taxation. Moreover, there is no reason to think that the list of four basic alternatives is exhaustive. Still, considering these four is at least a good starting point.

Principle 1: Beneficiaries Pay.

Normally, people have to pay for goods and services if they want to consume them—at least, this is the theory of a market economy. When the private market is unable to produce certain goods, perhaps because of collective action problems, the government steps in. But, the basic principle that the costs of producing goods should be borne by those who benefit from them remains appealing. On this theory, the individuals who benefit from adaptation should pay the cost. On an analogous issue in the theory of taxation, Eric Rakowski suggests that

[p]eople who live in far-flung areas present an interesting problem if in fact their personal security is more costly to preserve, given a nation's geography and its neighbors. Local differences in risks and associated police costs are in many nations reflected appropriately in varying local taxes. . . . Perhaps the way to think of these situations is the following. A nation committed to protecting its citizens as equals will attempt to maintain its borders and to supply people living throughout its territory with basic protection. But it cannot fully equalize protections throughout, at least not if it taxes all the same, so that those who choose to live in certain places know that they take on some risks and costs, perhaps including private protection, as the price of their decisions. Privately purchased protection or the assumption of additional risk, coupled with equal taxes, is tantamount to equal protection with un-

equal tax payments.⁹⁴

In simpler terms, the point is that people who choose to live in riskier areas cannot fairly demand that their fellow citizens pay to provide them protection from these risks.

This principle could be implemented in several different ways. It would seem to call for placing the responsibility for adaptation at the lowest possible governmental level so that both costs and benefits would be concentrated on the same group. Thus, coastal measures might be financed by coastal states, or even better, by coastal counties within those states. Sometimes, an adaptation project's beneficiaries will not correspond to any existing political entity. We might respond by creating a special purpose entity; it is easy to imagine Climate Change Adaptation Districts like today's drainage or irrigation districts.

Alternatively, we might finance adaptation projects through special tax assessments, just as the owners of property may have to pay a special assessment to finance sidewalks or other improvements. For instance, if new varieties of wheat are needed because of climate change, wheat farmers might pay a special fee. Or, if a flood zone needs additional levees, landowners might pay a special tax.

In terms of the social goals discussed elsewhere, "Beneficiary Pays" rates particularly well in terms of eliminating moral hazard and rent-seeking. If project beneficiaries have to pay for projects, they are unlikely to want to over-invest beyond the project's benefits or to lobby the government for projects that will raise their taxes more than any corresponding benefit they receive. To the extent that we are concerned about overinvestment in adaptation, "Beneficiary Pays" is the ideal solution.

On the other hand, "Beneficiary Pays" does not advance other possible social goals. For example, it provides no incentive for emitters to mitigate. It leaves the costs of climate change where it finds them, doing nothing to advance loss spreading. Furthermore, to the extent that we view emitters as culpable or unjustly enriched by their failure to mitigate, "Beneficiary Pays" does not advance the concept of just deserts. Finally, because benefits and costs fall on the same individuals, "Beneficiary Pays" also fails to serve any redistributive goal.

Whether or not these are serious shortcomings depends in part upon whether these other social goals are viewed as important. It

94. Eric Rakowski, *Can Wealth Taxes be Justified?*, 53 TAX L. REV. 263, 304 n.75 (2000).

also depends on whether we have alternative methods to advance those goals. For example, if we have optimum mitigation requirements, complete insurance for all risks, and a fiscal system that achieves our desired income distribution, we do not need to rely on the loss allocation system to achieve those goals. We may also think that just deserts is not a valid goal for social policy or that the circumstances of climate change are not such as to involve any principle of just deserts. Thus, evaluating the normative appeal of "Beneficiaries Pay" may be complicated.

There are also practical issues to be considered. Determining the beneficiaries of a given project may be straightforward, thus limiting transaction costs. Yet this will not always be true. Adaptation projects may indirectly benefit other sectors of society. For example, a water storage project may primarily benefit users in the immediate area, but it may also offer a potential fallback supply to other users in unusual drought conditions. Or, it may prevent local residents from moving elsewhere, which would have created the need for public services and infrastructure in those locations. Disputes over how benefits are allocated could become quite heated, with expert witnesses marshalling the evidence for attributing benefits in different ways.

In short, "Beneficiary Pays" is most appealing when the beneficiaries can be easily identified and when mitigation incentives, loss spreading, and just deserts are seen as unimportant or not relevant, or these other goals are addressed through other mechanisms.

Principle 2: The Public Pays.

Another alternative is for the cost of adaptation to fall on the federal taxpayer.⁹⁵ (In the international system, presumably the cost would fall on individual nations in proportion to wealth or income, with the burden transferred to individuals through national tax systems). This system achieves the maximum amount of loss spreading. It expresses the idea that climate change is a national

95. For present purposes, it is irrelevant whether the government finances projects directly through taxes or by issuing bonds, which will later result in payments financed through taxes. It would make a difference, however, if imperfections in the bond market allowed the government to transfer some of the costs away from taxpayers to bondholders. This might have different loss-spreading and distributional effects than taxation, depending on the identity of the taxpayers. For example, if the federal government sold all of the bonds to foreigners and then defaulted, the taxpayers might escape any financial responsibility (though the government's credit might be impaired). On the other hand, if the government did not default, then adaptation costs would be pushed later in time, to fall on the shoulders of later taxpayers when the bonds are paid off.

problem, thus emphasizing national solidarity in the face of the threat. To the extent we are satisfied with the tax system in distributional terms, it also provides the correct distributional result for climate costs.

We can imagine several ways for this principle to be implemented. The federal government might simply take mitigation as its own responsibility and pay for projects directly from the Treasury. Alternatively, state and local governments might receive federal grants to engage in mitigation, or private sector actors might receive tax credits or other subsidies.

Although it rates well in terms of loss spreading, “Public Pays” is problematic along other dimensions. It maximizes the potential for moral hazard and rent seeking, since financial responsibility for adaptation is uncoupled from receipt of benefits. In the worst case scenario, climate adaptation might become the biggest pork barrel in history. It also allows emitters to escape any responsibility, which might be troubling in terms of just deserts.

One clear advantage of “Public Pays” is low transaction costs. Running the federal tax system is not cost free, but it is clearly much cheaper than other loss allocation methods such as litigation. The transaction costs would all be on the other side, in terms of identifying and implementing adaptation projects. But those costs are essentially unavoidable parts of any adaptation strategy, and there is no obvious reason why the costs would be higher if the federal government controlled adaptation than if the task were given to states or other entities.

Thus, “Public Pays” is most appealing when the need for adaptation is easily monitored (reducing the incentive to seek rent), when there is little risk that adaptation will cause undesirable reductions in self-protective action by beneficiaries, and when just deserts and mitigation incentives are not pressing concerns.

Principle 3: The Polluter Pays.

The strongest justification for the third possible approach, “Polluter Pays,” is just deserts. Prior to the last quarter of the twentieth century, emitters may not have had strong grounds for believing that their conduct would cause serious harm. Nevertheless, the fact remains that they have caused harm, and in the process, they have enjoyed lower costs than they would have incurred by using alternative technologies or by reducing output. Thus, there is arguably a strong element of unjust enrichment, at least in some situations. For those concerned with culpability, apportioning responsibility on the basis of emissions after some cutoff date would

be an appropriate response. One possible cutoff date would be 1992, when the United States and other nations entered into a framework agreement to reduce greenhouse gases.⁹⁶ At that point, the international community had formally identified the harm; any emitter after that date was at least on notice of the damaging nature of the conduct. Thus, there is a potentially plausible basis for reallocating adaptation costs to emitters.

In addition to just deserts, "Emitters Pay" could serve other social goals. As discussed earlier, the prospect of financial responsibility could serve as a valuable incentive for reducing emissions. This is especially relevant in the absence of a global system of emission mitigation. Furthermore, if climate changes victims are poorer than emitters, as seems to be true at least in the international sphere, "Emitters Pay" could also serve redistributive goals. Finally, emitters may be in a good position to spread costs to shareholders or consumers, thus serving the loss-spreading function.

Some concrete proposals have made for implementing the "Emitters Pay" principle internationally:

Some commentators have proposed the use of adaptation levies. In particular, they suggest an air ticket levy may be particularly relevant given the low levels/exemptions from taxation from which it has benefited historically, and the projected growth in aviation emissions. Such a levy could distinguish between short- and long-haul flights and classes of travel, and could be argued to have advantages on grounds of both equity (taxing "luxury" emissions rather than "survival" emissions) and efficiency (using a price instrument rather than quantity).⁹⁷

Another suggestion is that "a new levy on Annex 1 countries, set at a fixed percentage of GDP and allocated to adaptation, would be one way to give a clear funding commitment under the UNFCCC."⁹⁸

The United States and other countries have already agreed in principle to take some responsibility for adaptation measures in less developed countries. Article 4.4 of the United Nations

96. See Brown, *supra* note 19, at 10742.

97. STERN, *supra* note 27, at 628 box 26.2 (footnotes omitted).

98. *Id.*

Framework Convention on Climate Change states that “developed country Parties and other developed Parties included in Annex II shall also assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects.”⁹⁹ Article 4.1(e) also calls on countries to “[c]ooperate in preparing for adaptation to the impacts of climate change;” countries are additionally directed to “develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods.”¹⁰⁰ This cooperation mandate amounts to a requirement of in-kind contribution to adaptation measures. Thus, at least in principle, the United States and other signatories to the framework agreement seem to have already agreed to assist with adaptation at the international level. It is also worth noting that the parties to the Kyoto agreement have embraced the use of an adaptation fund which is financed by a share of the proceeds generated by the Clean Development Mechanism.¹⁰¹

Among emitters, adaptation costs could be allocated on the basis of pro rata contributions to emissions.¹⁰² An alternative starting point for assessing responsibility for climate change liability is suggested by the penalty provisions of the Clean Air Act (CAA). Under section 120(d) of the CAA, polluters are assessed a penalty for noncompliance with the statute based on “the economic value of noncompliance.”¹⁰³ By removing this economic benefit, the non-compliance penalty eliminates the incentive to delay compliance and also prevents firms from obtaining an unfair advantage over competitors who have chosen to comply promptly. By analogy, entities that have failed to take timely steps to reduce greenhouse emissions could be assessed on the basis of the economic benefits that they have attained from the delay. This would have an incentive effect by reducing the benefits of delay, but could also be justified as a form of restitution for unjustly gained benefits.

“Emitters Pay” could be implemented through some kind of

99. U.N. Framework Convention on Climate Change art. 4.4, http://unfccc.int/essential_background/convention/background/items/1362.php. (last visited Dec. 3, 2007).

100. *Id.* art. 4.1(e).

101. Dean Scott, *U.N. Climate Talks Make Some Progress on Adaptation*, *Joint Implementation*, 29 INT’L ENVTL. REP. 867 (2006).

102. Allocation issues are discussed in detail in the third of my articles, Farber, *Who’s to Blame?*, *supra* note 1.

103. 42 U.S.C. § 7420(a)(2)(A) (2000). Regulations implementing this provision were upheld in *Duquesne Light Co. v. EPA*, 698 F.2d 456 (D.C. Cir. 1983).

penalty or tax, or, alternatively, through a claims adjudication program or through litigation.¹⁰⁴ The transaction costs are a genuine concern but may be manageable through good tax design or a well-crafted administrative compensation system. A key issue on which reasonable people may differ is whether emitters have some moral responsibility for the resulting adaptation costs. As compared with “Beneficiaries Pay” (but not the other principles), “Emitters Pay” also raises moral hazard and rent-seeking issues to the extent that the system is unable to weed out claims based on excessive adaptation efforts. One way to discourage this form of moral hazard is to emulate insurance companies and create a “deductible” that places some of the cost of any adaptation effort on the claimant.¹⁰⁵

Short-term implementation of “Emitters Pay” seems relatively feasible, but there are additional problems posed by longer term use of this principle. As the relative shares of greenhouse emitters shifts over time, the ideal approach would be to establish how much of a source’s emissions are in the atmosphere at any given time and then to determine the marginal change on temperature, finally tracing the marginal effects of specific weather phenomenon and, from there, deriving the marginal increase in adaptation costs. This may well be too complex for reasonable implementation. There is at least a *prima facie* argument for using average shares instead of looking to marginal effects. Also, over time, many emitters may disappear through bankruptcy, some form of business reorganization, or perhaps a regime change. This poses the problem of how to deal with these “orphan” shares.

Finally, because greenhouse gases remain in the atmosphere so long, today’s emitters could be causing adverse impacts and hence adding to the costs of adaptations many years in the future.¹⁰⁶ This could result in vastly long-term exposure to liability. A rough approximation might be simply to hold all current emitters liable for current adaptation costs based on their proportional share of current adaptation efforts, but to cut off future liability for those

104. Implementation mechanisms are discussed in Farber, *Basic Compensation for Victims of Climate Change*, *supra* note 1.

105. A similar technique could be adopted under “Public Pays” by requiring adaptation expenses to exceed a floor before they receive public support or by requiring cost sharing.

106. Some of the fluctuations can be seen from figures reported in Sunstein, *supra* note 24, at 39 fig.6. The United States was responsible for 23% of annual CO₂ emissions in 1990 but will be down to 19% in 2025, while China will go from 10% to 23% over the same time period. In terms of their share of cumulative emissions up to 2002, the United States will still be at 30%, while China will be at only 8%. This makes the question of whether to base contributions to adaptation costs on marginal emissions or on cumulative emissions quite important. I plan to explore this question in a separate paper.

emissions. An alternative would be to require current emitters to pay into some kind of long-term adaptation fund, which could disperse funds for many decades as the adaptation needs arise. Assuming the fund can invest contributions in excess of current needs in the financial markets, discounting might allow the emitters to make current payments at some reasonable level.

Principle 4: Climate Change Winners Pay

Not everyone will be harmed by climate change, at least at moderate levels of temperature increase. “Winners Pay” postulates that those who benefit from climate change should help the losers adapt. This approach furthers loss-spreading and social solidarity goals. If we believe that luck is an inappropriate basis for distributing income and wealth, we might also support “Winners Pay” on the grounds of just deserts.

As Stern indicates, there will be some possible winners to whom this principle might apply:

In higher latitude regions, such as Canada, Russia and Scandinavia, climate change could bring net benefits up to 2 or 3°C through higher agricultural yields, lower winter mortality, lower heating requirements, and a potential boost to tourism. But these regions will also experience the most rapid rates of warming with serious consequences for biodiversity and local livelihoods.¹⁰⁷

...

[generally, the] broad distribution of impacts across many sectors might stimulate a broad northward shift in economic activity and population in regions such as [] North America or Europe, as southern regions begin to suffer disproportionate increases in risks to human health and extreme events, coupled with loss of competitiveness in agriculture and forestry, reduced water availability and rising energy costs.¹⁰⁸

As a well-known journalist recently observed, the effects on property values could be remarkable in some locations.¹⁰⁹ Cities

107. STERN, *supra* note 27, at 138.

108. *Id.* at 144.

109. Gregg Easterbrook, *Global Warming: Who Loses— and Who Wins?*, 299 ATLANTIC 52 (2007).

like Buffalo, New York might find new popularity, while “Florida’s rapid growth could be, well, swamped by an increase in its perilously high groundwater table,” and “Houston could decline, made insufferable by worsened summertime humidity.”¹¹⁰ Internationally, “nearly all the added land-value benefits of a warming world might accrue to Alaska, Canada, Greenland, Russia, and Scandinavia;”¹¹¹ in particular, “[w]arming’s benefits to Russia could exceed those to all other nations combined.”¹¹² Real estate above the Arctic Circle may be a shrewd long-term investment!

“Winners Pay” has a number of drawbacks. It is prone to moral hazard and provides no incentives (or moral corrective) to emitters (except to the extent that winners might otherwise be tempted to increase emissions in order to promote additional climate change in their favor). Because the winner countries may have relatively low populations, it is a less than ideal way to engage in loss spreading, since only a small share of world population or even of the affluent will bear the costs. Nevertheless, this approach may have some appeal, at least as a secondary approach for loss allocation.

C. Which Approach(es) to Favor?

A table may be helpful in summarizing some of the main points of the discussion.

	Beneficiaries Pay	Public Pays	Emitters Pay	Winners Pay
Incentives for Emitters	No	No	Yes	No
Moral Hazard	No	Yes	Yes	Yes
Just Deserts	No	No	Yes	Possible
Loss Spreading	No	Yes	Partial	Partial
Distributive Benefits	No	Yes	International	Some

110. *Id.* at 56.

111. *Id.*

112. *Id.* at 57. As Easterbrook puts it in somewhat lyrical terms:

And Russia! For generations poets have bemoaned this realm as cursed by enormous, forboding, harsh Siberia. What if the region in question were instead enormous, temperate, inviting Siberia? Climate change could place Russia in possession of the largest new region of pristine, exploitable land since the sailing ships of Europe first spied the shores of what would be called North America. The snows of Siberia cover soils that have never been depleted by controlled agriculture. *Id.*

Easterbrook also advises the reader to “look for purchase opportunities near the waters of the Arctic Circle. . . . Assuming arctic ice continues to melt, the world’s cargo vessels may begin sailing due north to shave thousands of miles off their trips.” *Id.* at 60-62.

My own preferred approach, at least tentatively, is “Emitters Pay.” Clearly, some people have profited from the absence of greenhouse controls well after the need for such controls became clear. Their conduct will cause long-term harm to others. In order to provide redress to the victims and provide an incentive for care in dealing with other emerging environmental problems, compensation seems to be warranted. The argument for “Emitters Pay” seems to be strongest as applied to conduct taking place *after* the harms of climate change were identified, so that emitters were on notice, but *before* effective regulatory controls are in place, which reduces the deterrence argument. Perhaps the biggest challenge is transaction costs, which would probably choke any effort to use the litigation system to implement “Emitter Pays.” There does, however, seem to be workable non-litigation approaches to implementing the principle.¹¹³

“Emitters Pay” may not be a feasible response because of political opposition or an inability to keep transaction costs manageable. It also seems most appropriate for the period of transitioning to an effective mitigation regime. An appealing fallback is “Beneficiaries Pay,” which has the advantage of minimizing rent-seeking and moral hazard. “Public Pays” is rife with those problems but is better at spreading risk and handling redistribution. In practice, a mix between these systems may be best, with beneficiaries and taxpayers splitting costs. Whenever beneficiaries of adaptation are able to shift costs elsewhere, however, rent-seeking and moral hazard rear their ugly heads, and safeguards against these abuses need to be carefully considered.

“Winners Pay” seems like the weakest of the allocation principles, at least as the main basis for allocating adaptation costs. On balance, climate change will be harmful, which means that the winners will gain less than the losers will lose, making the win-

113. Here is one method for establishing such a system while keeping transaction costs under control. Consider a possible international compensation commission. The commission would receive claims from countries that have incurred adaptation expenses such as strengthening sea walls or providing alternative sources of ecosystem services to replace lost wetlands. The commission would determine which adaptation expenses were reasonable and would schedule them for compensation. Compensation might be directly from an international fund, but an alternative payment system might be more appealing if an international trading system for greenhouse gases was in place. In this alternative way of financing compensation, a set number of greenhouse gas allowances could be set aside for the commission. The commission would use these allowances to pay claims; in turn, the claimants could sell them to greenhouse gas emitters on the open market. The net effect would be that the sources doing the least to reduce their emission levels, which would have the greatest need to purchase additional emission permits, would indirectly provide compensation for the expenses of adaptation. Thus, a wealth transfer would take place from poorly controlled sources of greenhouse gases to the victims of climate change.

nings a limited source of compensation. Moreover, the winners have merely been lucky, having drawn lucky numbers in the regional impact lottery; they have not been culpable in causing the problem. Thus, whatever appeal "Winners Pay" might have seems to be part of a general view that locational luck should not be a determinant of wealth. Accepting this principle would require massive international redistribution of a kind that does not seem to have much current traction; for example, oil revenues would have to be shared among the entire global population, and countries with good soil and climate would have to share agricultural earnings.

Even if we do not accept it as a separate principle, "Winners Pay" may be a byproduct of other approaches. In particular, "Winners Pay" may be a side effect of "Public Pays." If taxes are progressive (or even wealth-neutral), then the winners will end up with an increased share of the tax bill simply because of their increased wealth, while losers will see their taxes lowered. For example, a property tax would naturally increase as land values rise in areas with desirable climate changes and fall in other areas.

"Winners Pay" may not be appealing as a basis for legal cost allocation, but it may still have appeal as an ethical basis for voluntary financial contributions. If the semi-Arctic areas end up becoming wealthy because of climate change, then their inhabitants might well feel some moral imperative to help those who have been less fortunate. Such voluntary contributions are salutary, but I have doubts that the beneficiaries of climate change should be compelled to fund adaptation elsewhere except to the extent that they also bear responsibility for causing the situation or we adopt a general principle of global redistribution.

IV. CONCLUSION

Given the high likelihood of climate change and the increasingly firm predictions of its impacts, it is only prudent to begin to consider how we will live with those consequences. This does not, of course, mean that we should merrily add greenhouse gases to the atmosphere in the hope that we will miraculously cope. But regardless of what mitigation measures are put in place, some degree of climate change—and hence some need for adaptation—will exist. This Article addresses the question of how the costs of adaptation should be allocated.

There is no completely uncontroversial answer to that question. Each solution has some normative appeal and some drawbacks. Without seeing a fully worked out version of the solutions, we are

also at a disadvantage in considering their actual workability. More fundamentally, however, our choice may depend on how we resolve some basic moral questions, such as whether the emitters of greenhouse gas have a moral responsibility for the resulting damage.

We are likely to debate this problem for decades. This Article suggests, however, that there is at least a strong case to be made for shifting a share of adaptation costs to emitters. “Winners Pay,” however, seems less appealing. Consequently, I would tentatively rank the principles in the following order of preference: first, “Emitters Pay”; second, a combination of “Public Pays” and “Beneficiaries Pay”; and third, “Winners Pay.”

Getting greenhouse emissions under control is probably the highest priority, but we cannot delay for long in planning for adaptation. Climate change will affect infrastructure decisions that are being made all the time, such as how high levees should be or how much storage capacity to create for urban water supply. As these expenses begin to accumulate, we will have to start asking questions about who should pay. Indeed, it seems almost certain that there will be growing dispute over these issues, both within the United States and internationally. Although the solution suggested in this Article is only tentative, there can be no doubt about one point. The legal community needs to begin thinking hard about this question now, so we will be in a position to contribute to its resolution when it erupts onto the political agenda.

AGENCIES IN LIMBO: MIGRATORY BIRDS AND INCIDENTAL TAKE BY FEDERAL AGENCIES

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I. INTRODUCTION

In Alaska, federal land is often cleared for a myriad of reasons including private mining claims, logging enterprises, road building, trail building, oil and gas exploration and drilling, pipeline construction and maintenance, and so on. The list is long and varied. One issue that ties all of these disparate activities together is the presence of migratory birds. According to the U.S. Fish and Wildlife Service (FWS), migratory birds “are found in all terrestrial habitats that occur in Alaska.”²

Alaska is home to 470 species of birds.³ All native birds found

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2. U.S. Fish & Wildlife Serv. - Alaska, Migratory Bird Management Landbirds/Raptors, <http://alaska.fws.gov/mbmp/mbm/landbirds/landbirds.htm> (last visited Oct. 17, 2007).

3. U.S. Fish & Wildlife Serv. - Alaska, Migratory Bird Management Overview, <http://alaska.fws.gov/mbmp/mbm/introduction.htm> (last visited Oct. 17, 2007). The website

in Alaska, with the exception of ptarmigan and grouse, are protected by the Migratory Bird Treaty Act (MBTA).⁴ Most birds are present in Alaska primarily during the summer months for breeding, nesting, and rearing of young. Coincidentally, those same months tend to be the time when most land clearance takes place. The federal agencies carrying out or permitting these land clearance activities, primarily the Bureau of Land Management (BLM) and the Forest Service (FS), due to those agencies' multiple use mandates,⁵ are aware that migratory birds will be present in the areas affected.⁶

The MBTA prohibits the "take" of migratory birds, their nests, or their eggs, except as permitted by regulation.⁷ Land clearance activities during the nesting season "take" migratory birds (mostly fledglings), eggs, and nests. These takes are not intentional, but rather incidental (meaning that the purpose of the activity was not to harm birds). While the MBTA obviously addresses the intentional taking of migratory birds, the act also prohibits the incidental taking of migratory birds. The statute's prohibition states that taking is unlawful "at any time, by any means or in any manner."⁸ However, if the prohibition against incidentally taking migratory birds was uniformly and strictly enforced, development activity in Alaska would likely grind to a halt. But, that has not happened.

The reason that this result has not occurred is that the courts have not recognized the problem of migratory bird deaths presented by land clearance activities, and the FWS has not used its authority to provide regulatory guidance that would help agencies abide by the Act and avert lawsuits. Therefore, while agencies like the BLM and the FS may not be prosecuted by the FWS for their incidental bird-taking, those agencies are still vulnerable to citizen

also states that "birds from Alaska pass through virtually every other state in the Union (even Hawaii) on the way to their wintering grounds. Maintaining migratory birds and their habitats in Alaska is clearly a matter of national and international significance." *Id.*

4. See U.S. Fish & Wildlife Serv., Advisory: Recommended Time Periods for Avoiding Vegetation Clearing in Alaska in Order to Protect Migratory Birds, http://alaska.fws.gov/fisheries/fieldoffice/anchorage/pdf/vegetation_clearing.pdf (last visited Oct. 17, 2007) [hereinafter FWS Advisory].

5. The Federal Land Policy and Management Act of 1976 directed the Secretary of the Interior to administer BLM lands using the multiple use sustained yield principle. 43 U.S.C. §§ 1701-1782 (1976). The Multiple Use Sustained Yield Act of 1960 instructed the Secretary of Agriculture to administer Forest Service lands under the multiple use sustained yield principle. 16 U.S.C. § 528 (1960).

6. See FWS Advisory, *supra* note 4, which was distributed to all federal agencies in Alaska. The advisory divides Alaska into regions and delineates when migratory birds are likely to be nesting in each area.

7. 16 U.S.C. § 703 (2000). "Take" is defined by the MBTA as: "pursue, hunt, shoot, capture, collect, kill, or attempt to pursue, hunt, shoot, capture, collect, or kill." 16 U.S.C. § 715(n) (2000).

8. 16 U.S.C. § 703(a).

suits seeking to enforce the no take requirements of the MBTA using the citizen suit provisions of the Administrative Procedure Act (APA).⁹ Federal agencies in Alaska continue to incidentally take birds in the course of land clearing, while operating under a false sense of security that such outcomes are legal. Such an outcome is wrought by the FWS's failure to promulgate regulations that better guide agency decision making, the courts' misinterpretation of the statute, and Congress' failure to amend the Act to correct for these problems.

This Article reviews the confusion surrounding the term "take" under the MBTA and how that confusion has led to inappropriate federal activity that illegally harms birds. Additionally, this Article seeks to explain why the courts' failure to interpret the act correctly continues to result in a great number of migratory bird deaths due to federal land clearance activities. Finally, the Article provides suggestions as to how the FWS could improve the current situation by developing incidental take regulations aimed at federal action.

II. FISH AND WILDLIFE SERVICE

A. *The Problem of Unprotected Federal Agencies*

In *Center for Biological Diversity v. Pirie*,¹⁰ an environmental group sued the U.S. Navy in order to prevent the use of live fire training exercises on one of the Northern Marianas Islands, because these exercises would harm several species of migratory birds without a permit. The environmental group claimed that this action was "not in accordance with law" within the meaning of the APA¹¹ under which they sued. The purpose of the training exercise was not to kill birds; therefore, while the bird deaths were uncontroverted,¹² they were unintentional. The Navy had actually ap-

9. 5 U.S.C. §§ 702-706 (2000).

10. 191 F. Supp. 2d 161 (D.D.C. 2002), *vacated*, Ctr. for Biological Diversity v. England, No. 02-5163, 2003 U.S. App. LEXIS 1110 (D.C. Cir. Jan. 23, 2003).

11. *Id.* at 175 (citing to 5 U.S.C. § 706(2)(A), which states that "[t]he reviewing court shall . . . hold unlawful and set aside agency action, findings, and conclusions found to be – (A) arbitrary, capricious, an abuse of discretion, or otherwise *not in accordance with law*." (emphasis added)).

12. "It is uncontested that defendants' military training activities on [the Northern Marianas Islands] will kill birds covered by the MBTA." *Id.* at 166. The court also refers to the following statement by defendants: "On several occasions we observed boobies nesting very close to unexploded ordinance [sic]. While the unexploded ordinance [sic] may not provide an immediate threat to the birds, it does indicate that bombs do fall in active nesting areas." *Id.*

plied to the FWS for an incidental take permit for these activities¹³ but was denied because “[t]here are no provisions for the Service to issue permits authorizing UNINTENDED conduct on the part of a permittee.”¹⁴ The FWS also stated that “it has long employed ‘enforcement discretion’ for activities that may be prosecuted pursuant to the MBTA but are not covered by the MBTA permitting regulations, that in this case it would ‘exercise its discretion not to take enforcement action’ against the Navy.”¹⁵ The exercise of this discretion, however, did not protect the Navy from a citizen suit under the APA for its violations of the MBTA. The court had no trouble finding that the Navy’s activities did indeed violate the MBTA, regardless of the fact that the bird deaths were unintentional. As the court stated, “the MBTA prohibits both intentional and unintentional killing.”¹⁶

This case was appealed in *Center for Biological Diversity v. England*, where the court of appeal issued an unpublished opinion vacating the case and remanding it for dismissal as moot.¹⁷ In the intervening time between the two cases, the Navy appealed to the Congress for help out of a situation that was untenable. The lower court had found the Navy’s activities to be unlawful without a permit, and the FWS refused to consider permitting the activity because their regulations did not provide for incidental take permits. Congress responded with an amendment to the MBTA in § 315 of the Bob Stump National Defense Authorization Act.¹⁸ This section, entitled “Incidental Taking of Migratory Birds During Military Readiness Activities,” required the FWS to develop regulations that would permit the Department of Defense to incidentally take migratory birds in the course of military readiness activities.¹⁹

13. *Id.*

14. *Id.* at 167 (quoting a Letter from J. Bradley Bortner, Chief, Migratory Birds and Habitat Programs, FWS, to Daniel Moriarty, Natural Resources Management Specialist, Pacific Division, United States Navy (Aug. 5, 1996)).

15. *Pirie*, 191 F. Supp. 2d at 168.

16. *Id.* at 174.

17. No. 02-5163, 2003 U.S. App. LEXIS 1110 (D.C. Cir. Jan. 23, 2003) (unpublished decision).

18. Pub. L. No. 107-314, § 315, 116 Stat. 2458 (2003).

19. *Id.* § 315(d).

The Migratory Bird Treaty Act is an important environmental statute that was enacted in 1918 to control the mass slaughter of birds for commercial purposes. Under the statute, a federal agency can obtain a permit to ‘take’ migratory birds intentionally, such as clearing large flocks of Canadian Geese from a landing field or golf course. However, a federal court recently ruled that the Navy had violated the Migratory Bird Treaty Act by accidentally taking migratory birds while conducting training at one of its facilities in Guam without a permit to take migratory birds. The court recognized a paradox in that the statute prohibits

In February 2007, the FWS finally issued the regulations required under the National Defense Authorization Act. Those regulations mandate that the military assess the effects of military readiness activities on migratory birds and, in conjunction with the FWS, develop and implement appropriate conservation measures if a proposed action may have a significant adverse effect on a migratory bird population.²⁰ Assuming the Department of Defense meets these requirements, it is protected from further MBTA related lawsuits, at least regarding military readiness activities, because the Department will be in compliance with the MBTA. The MBTA, after all, states that it is unlawful to kill migratory birds “except as permitted by regulations”²¹ which the Department can now follow. This regulatory change has therefore cleared up the problem for the Department of Defense (with regard to training exercises), but has still left other agencies in the same limbo of being required to violate the MBTA in order to accomplish other statutory goals, but with no recourse to or regulatory guidance from FWS.

B. Ad Hoc Guidance Unheeded

While the problem has yet to be resolved, there have been attempts made to improve federal agency compliance with the MBTA, particularly in Alaska. First, in 2001 President Clinton issued an Executive Order which was intended to more clearly outline the responsibilities of federal agencies with regard to the MBTA.²² Second, the FWS Alaska Regional Office issued an advisory to federal agencies in Alaska that was intended to guide agency decision making regarding land clearance activity that would impact migratory birds. Unfortunately, neither of these efforts has yielded much in the way of changed federal agency behavior.

the issuance of a permit to authorize unintentional takings during military readiness activity. The committee recommends a provision that would amend the Migratory Bird Treaty Act to correct this paradox.

H.R. REP. NO. 107-436, at 286 (2002). “This section would amend section 704 of title 16, United States Code, to give the Department of Defense statutory authority under the Migratory Bird Treaty Act, P.L. 93-300, to obtain a permit for incidental taking of birds during authorized military readiness activity.” H.R. REP. NO. 107-436, at 294, § 311 (2002).

20. Migratory Bird Permits; Take of Migratory Birds by the Armed Forces, 72 Fed. Reg. 8931 (Feb. 28, 2007) (to be codified at 50 C.F.R. pt. 21). *See also* News Release, U.S. Fish & Wildlife Serv., Service Finalizes Rule Allowing Incidental Take of Migratory Birds for Military Readiness (Feb. 28, 2007), <http://www.fws.gov/news/NewsReleases/showNews.cfm?newsId=0986AD30-D07F-A091-E9573BBF893E2716> (last visited Oct. 19, 2007).

21. 16 U.S.C. § 703(a) (2000).

22. Exec. Order No. 13,186, 66 Fed. Reg. 3853 (Jan. 10, 2001).

The Executive Order accomplishes three main goals: it defines certain terms, outlines federal agency responsibility, and establishes a Council for the Conservation of Migratory Birds. Of the terms it defines, perhaps the most important is the word “take,” which the Executive Order defines as including “both ‘intentional’ and ‘unintentional’ take.”²³ This is a clear attempt to rectify some of the inconsistencies in various interpretations of the MBTA that will be discussed in the next section of this paper. The major requirement laid out by the Executive Order is the development of a Memorandum of Understanding (MOU) between “[e]ach Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations.”²⁴ The MOUs were supposed to have been completed within two years of the date of the Executive Order, which was signed in 2001. To date, only two MOUs have been completed.²⁵

The purpose of the MOUs is, in part, to “support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and *by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.*”²⁶ The MOUs are also intended to

[I]dentify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations . . . [and] [w]ith respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will *lessen the amount of unintentional take*, developing any such conservation efforts in cooperation with the [FWS].²⁷

Therefore, at the heart of the MOU requirement is an attempt to avoid federal incidental take violations by providing a framework in which to evaluate and mitigate them, and provide the FWS seal-of-approval of sorts.

Most federal agencies do not seem to have acted upon the Executive Order as of yet. The major tangible requirement of develop-

23. *Id.* at 3853, § 1(a).

24. *Id.* at 3854, § 3(a).

25. See U.S. Fish & Wildlife Serv., Division of Migratory Bird Management, <http://www.fws.gov/migratorybirds/> (last visited Oct. 19, 2007), where the Department of Defense and Department of Energy’s MOUs are available.

26. Exec. Order No. 13,186, 66 Fed. Reg. at 3854, § 3(e)(1) (emphasis added).

27. *Id.* at 3855, § 3(e)(9) (emphasis added).

ing MOUs with FWS has been observed only by the Department of Defense and the Department of Energy, the only two agencies where the work, or the work of its constituents, has been markedly affected by negative court cases over migratory birds.²⁸ Additionally, failure to abide by the Executive Order is not justiciable,²⁹ so citizens cannot use the courts to force agencies to abide by it.

Separately, the FWS has tried other means to improve federal compliance with the MBTA. For example, the FWS Alaska Regional Office has issued an advisory to all federal agencies operating in Alaska, stating that “[v]egetation clearing, site preparation, or other construction activities that may result in the destruction of active bird nests or nestlings would violate the MBTA.”³⁰ The advisory then provides very specific timing guidelines to help agencies comply with the MBTA by avoiding construction activities during nesting season.³¹ Following this advisory would obviously help agencies meet the goals of the Executive Order, by decreasing their unintentional take, and help the goals of the MBTA, by decreasing the likelihood of taking migratory birds at all. However, there is no indication that agencies in Alaska have taken this advice to heart, and land clearance activities during nesting seasons seem to have continued unabated. After all, the advisory is merely a recommendation, not a requirement.³² Nesting season in Alaska, as previously stated, tends to coincide with the prime construction season, and nearly all lands in Alaska are home to some migratory bird population. Therefore, nearly all development work would likely have to cease in order to fully comply with the advisory.

Finally, while both the Executive Order and the FWS advisory might help agencies avoid litigation by avoiding a violation of the MBTA, neither is enforceable, and thus perhaps not compelling, for agencies who still believe that incidental take by federal agencies is not a violation of the MBTA, particularly if that take is a

28. See, e.g., *Ctr. for Biological Diversity v. Pirie*, 191 F. Supp. 2d 161 (D.D.C. 2002) (finding the Navy in violation of the MBTA for failing to get a permit from the FWS before incidentally taking migratory birds through training exercises); *United States v. Moon Lake Elec. Ass’n, Inc.*, 45 F. Supp. 2d 1070 (D. Colo. 1999) (holding electric utility guilty of violating the MBTA by incidentally electrocuting birds that roosted on their power poles).

29. See Exec. Order No. 13,186, 66 Fed. Reg. at 3856, § 5(b), which states that [t]his Order is intended only to improve the internal management of the executive branch and does not create any right or benefit, substantive or procedural, separately enforceable at law or equity by a party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.

Id.

30. FWS Advisory, *supra* note 4.

31. *Id.*

32. *Id.* (“The . . . timing guidelines are not regulations, but are intended as recommendations to help [agencies] comply with MBTA.”).

result of habitat destruction.

III. THE FEDERAL COURTS

As I have stated, federal agencies are operating under a false sense of security, supported by the fact that the FWS does not address the issue of incidental take in regulation. Compounding this problem are several poorly reasoned federal court cases that suggest that incidental take, particularly through habitat destruction, is not a violation of the MBTA.³³ For example, in an Interior Board of Land Appeals opinion, both the Administrative Law Judge and the BLM rely on *Seattle Audubon Society v. Robertson*³⁴ for their position that certain timber lease sales in Oregon are legal, even though migratory bird habitat will be destroyed.³⁵ The Department of the Interior is relying on an opinion that, first, does not properly interpret the MBTA, which will be highlighted in Part B below, and second, does not acknowledge all of the relevant facts, which will be highlighted in Part C below. The result is that the BLM's (and other agencies') reliance is misplaced, and may leave these agencies open to law suits which they could lose.

The courts that have rejected the idea that habitat destruction is an incidental take or, in the alternative, courts that found that incidental take falls within the meaning of take under the MBTA at all have relied on several central arguments to bolster their position. I will analyze the most pervasive of these arguments here. The first argument is that only intentional takes are regulated by the MBTA, and therefore unintentional or incidental takes are not a violation of the statute. The second argument is that the taking must be "direct," and perhaps even only includes those takings associated with hunting and poaching;³⁶ implicit in this argument is the idea that habitat destruction does not result in direct bird deaths, particularly when caused by federally permitted logging.³⁷

33. See, e.g., *City of Sausalito v. O'Neill*, 386 F.3d 1186 (9th Cir. 2004); *Seattle Audubon Soc'y v. Evans*, 952 F.2d 297 (9th Cir. 1991); *Mahler v. U.S. Forest Serv.*, 927 F. Supp. 1559 (S.D. Ind. 1996); *Portland Audubon Soc'y v. Lujan*, No. 87-1160-FR, 1991 U.S. Dist. LEXIS 6224 (D. Or. May 8, 1991).

34. No. C89-160WD, 1991 U.S. Dist. LEXIS 10131 (W.D. Wash. March 7, 1991). The MBTA related portions of this opinion were later affirmed by *Evans*, which will be discussed in detail later in this paper.

35. *In re Bar First Go Round Salvage Sale*, 121 IBLA 347, 351 (1991). See also *Or. Natural Res. Council*, 116 IBLA 355 (1990).

36. See *City of Sausalito*, 386 F.3d at 1225; *Evans*, 952 F.2d at 303; *Mahler*, 927 F. Supp. at 1579.

37. A third argument, that the MBTA could not apply to federal actions at all, has since been so thoroughly repudiated by the courts, the Executive Order, and the FWS, that it does not bear discussing here. See, e.g., *Humane Soc'y v. Glickman*, 217 F.3d 882 (D.C. Cir. 2000) (finding that the MBTA does constrain federal agency action as well as private ac-

A. Intent Is Not a Requirement of the MBTA

Several courts have stated that logging and other types of habitat destruction cannot be violations of the MBTA because the Act requires intent to kill or take birds in order to rise to the level of a violation.³⁸ For instance, the district court in *Mahler v. United States Forest Service* found that habitat destruction was not a violation of the MBTA in part because “[t]he better reading of the statute is to find that the prohibitions apply only to activity that is *intended* to kill or capture birds.”³⁹

The language of the statute, however, belies this interpretation. The statute provides for two penalties for violating its precepts; the first is a misdemeanor using a strict liability standard,⁴⁰ and the second is a felony conviction, which requires intent.⁴¹ Therefore, the statute itself provides that proof of intent is only required when the government is pursuing a felony conviction. Several courts, following this interpretation, have assigned liability to public and private entities for accidental or unintentional migratory bird deaths.⁴²

The federal government has also recognized the applicability of the MBTA to unintentional take fact patterns. “At least in the criminal prosecutions in *FMC Corp.* and *Corbin Farm Service*, the United States government has taken . . . the position . . . that the MBTA applies to unintended deaths of migratory birds caused by human action (and even inaction).”⁴³ The FWS has also stated ex-

tion). This case is especially relevant since the D.C. Circuit is the forum where most actions against federal agencies are lodged.

38. See, e.g., *Mahler*, 927 F. Supp. 1559.

39. *Id.* at 1583 (emphasis added). See also *United States v. Delahoussaye*, 573 F.2d 910, 913 (5th Cir. 1978) (holding that violations of the MBTA require proof of scienter).

40. See 16 U.S.C. § 707(a) (2000):

Except as otherwise provided in this section, any person, association, partnership, or corporation who shall violate any provisions of said conventions or of this subchapter, or who shall violate or fail to comply with any regulation made pursuant to this subchapter shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined not more than \$15,000 or be imprisoned not more than six months, or both.

41. See 16 U.S.C. § 707(b):

Whoever, in violation of this subchapter, shall knowingly—

(1) take by any manner whatsoever any migratory bird with intent to sell, offer to sell, barter or offer to barter such bird, or

(2) sell, offer for sale, barter or offer to barter, any migratory bird shall be guilty of a felony and shall be fined not more than \$2,000 or imprisoned not more than two years, or both.

42. See, e.g., *United States v. Corrow*, 119 F.3d 796, 805 (10th Cir. 1997); *United States v. Manning*, 787 F.2d 431, 435 (8th Cir. 1986); *Ctr. for Biological Diversity v. Pirie*, 191 F. Supp. 2d 161, 174 (D.D.C. 2002); *United States v. Moon Lake Elec. Ass’n, Inc.*, 45 F. Supp. 2d 1070, 1073-74 (D. Colo. 1999).

43. *Mahler*, 927 F. Supp. at 1577 (referring to cases in which the federal government

plicitly that both intentional and unintentional bird deaths are violations of the MBTA.⁴⁴ This seems to be the opinion of the entire executive branch, as the Executive Order, described above, asserts.⁴⁵

Furthermore, Congress itself has recognized and accepted the use of strict liability by the courts to enforce the statute: “[n]othing in this amendment is intended to alter the ‘strict liability’ standard for misdemeanor prosecutions under 16 U.S.C. [§] 707(a), a standard which has been upheld in many Federal court decisions.”⁴⁶ Since Congress, not to mention the controlling agency, and much of the federal court system, seems to ratify the strict liability approach, there should be no doubt that intent is not a required element.

B. The MBTA Does Not Differentiate Between Direct and Indirect Deaths

The second common argument against including habitat destruction among the activities banned by the MBTA is that habitat destruction only harms birds indirectly, while the Act only contemplates “direct” bird deaths.⁴⁷ Some courts have even further limited the statute’s applicability by claiming that, not only do the bird deaths have to be a direct result of the action taken, but the initial action has to be hunting/poaching-related in order to be relevant.⁴⁸ There are two cases that best demonstrate this point of view: *Seattle Audubon Society v. Evans*⁴⁹ and *Mahler v.*

successfully prosecuted private entities under the MBTA for accidentally poisoning birds in the first case through toxic materials released into a pond and in the second case through the application of agricultural pesticides). See *United States v. FMC Corp.*, 572 F.2d 902 (2d Cir. 1978); *United States v. Corbin Farm Serv.*, 444 F. Supp. 510 (E.D. Cal. 1978).

44. See FWS Advisory, *supra* note 4; 72 Fed. Reg. 8931 (Feb. 28, 2007) (to be codified at 50 C.F.R. pt. 21).

45. Exec. Order No. 13,186, 66 Fed. Reg. 3853, 3853, § 2(a) (Jan. 10, 2001) (defining “take” as both intentional and unintentional).

46. S. REP. NO. 99-445 at 16 (1986), *reprinted in* 1986 U.S.C.C.A.N. 6113, 6128 (1986).

47. See, e.g., *Seattle Audubon Soc’y v. Evans*, 952 F.2d 297, 303 (9th Cir. 1991) (agreeing with other cases in which unintended bird deaths were found to be violations of the MBTA because those deaths were a *direct* result of the action taken, but argues that since habitat destruction leads only indirectly to bird deaths, if at all, it is not a taking).

48. See, e.g., *City of Sausalito v. O’Neill*, 386 F.3d 1186, 1225 (9th Cir. 2004) (finding that even habitat destruction which led indirectly to bird deaths was not an unlawful taking under the MBTA, because MBTA “describes physical conduct” (quoting *Evans*, 952 F.2d at 302)); *Newton County Wildlife Ass’n v. U.S. Forest Serv.*, 113 F.3d 110, 115 (8th Cir. 1997) (agreeing with *Evans* that only hunters and poachers were the intended targets of the MBTA prohibitions); *Citizens Interested in Bull Run, Inc. v. Edrington*, 781 F. Supp. 1502, 1510 (D. Or. 1991).

49. 952 F.2d 297 (9th Cir. 1991).

U. S. Forest Service.⁵⁰ In *Evans*, the environmental group challenged Forest Service plans to log old growth in national forests, claiming that the logging would violate several statutes, including the MBTA.⁵¹ In *Mahler*, the agency was initially sued for violations under the National Forest Management Act, the MBTA, and the National Environmental Policy Act in relation to a proposed salvage timber sale in the Hoosier National Forest.⁵² When these legal challenges failed, the plaintiff filed a motion for reconsideration, arguing that the harvest, which was to coincide with the nesting season of migratory songbirds, would violate the MBTA because it would result in “direct takings.”⁵³

In *Evans*, the court compares the MBTA’s language to the language of the Endangered Species Act (ESA).⁵⁴ Because the ESA defines “take” by using, among other words, the word “harm,” but the MBTA does not include the word “harm” in its definition of “take,” the *Evans* court found that “take” under the MBTA could not include habitat destruction, and could only encompass direct bird deaths.⁵⁵

This same issue was subsequently parsed by the Supreme Court in *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*.⁵⁶ In *Babbitt*, the Supreme Court stated that “[s]everal of the words that accompany ‘harm’ in the [ESA’s] definition of ‘take,’ especially ‘harass,’ ‘pursue,’ ‘wound,’ and ‘kill,’ refer to *actions or effects that do not require direct applications of force*.”⁵⁷ The Supreme Court made this statement to counter the opinion of the lower court, which found that “harm” could not refer to an activity that indirectly hurts wildlife, in part because the other verbs surrounding “harm” all required direct application of force; therefore, the lower court reasoned that “harm” ought to be similarly understood.⁵⁸

Because the Supreme Court determined that words such as “pursue,” “wound,” and “kill” do not require a direct application of force under the ESA, there is no reason to believe that those words, which are also used to define “take” under the MBTA, ought to be understood any differently under the MBTA. Ulti-

50. 927 F. Supp. 1559 (S.D. Ind. 1996).

51. Other statutes used as grounds for the lawsuit include the National Forest Management Act and the Endangered Species Act. See *Evans*, 952 F.2d at 298.

52. 927 F. Supp. at 1561.

53. *Id.* at 1574.

54. 16 U.S.C. §§ 1531-1544 (1973).

55. *Seattle Audubon Soc’y v. Evans*, 952 F.2d 297, 302-03 (9th Cir. 1991).

56. *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687 (1995).

57. 515 U.S. at 701 (emphasis added).

58. *Id.*

mately, the Supreme Court's opinion in *Babbitt* proves that "harm" encompasses habitat destruction, but it does not prove that *only* "harm" encompasses habitat destruction. "As noted in *Babbitt*, but not by the Ninth Circuit in [*Evans*], the contemporaneous definitions of 'kill' and 'take' do not include the word 'directly' or suggest in any way that only direct applications of force constitute 'killing' or 'taking.'"⁵⁹ The court in *United States v. Moon Lake Electric Association* sums this up succinctly by stating:

pursuing, killing wounding, collecting, possessing . . .
 . all constitute acts that may be performed without
 exhibiting the physical conduct normally
 associated with hunting and poaching.

By prohibiting the act of "killing" in addition to the acts of hunting, capturing, shooting, and trapping, the MBTA's language and regulations suggest that Congress intended to prohibit conduct beyond that normally exhibited by hunters and poachers. *Indeed, the MBTA does not seem overly concerned with how captivity, injury, or death occurs.*⁶⁰

The *Evans* court's emphasis on the presence or absence of different verbs in the definitions of "take" is even odder given the fact that the opinion cited cases such as *United States v. FMC Corp.* and *United States v. Corbin Farm Service* with approval.⁶¹ In both of these cases it was determined that incidentally *poisoning* migratory birds was a "take" within the meaning of the MBTA.⁶² Moreover, Bean and Rowland, in their book *The Evolution of National Wildlife Law*, point out that while "harm" is not listed under the MBTA as it is under the ESA, neither is "poison," though it is listed under the Bald and Golden Eagle Protection Act as part of that statute's definition of "take."⁶³ Yet, the *Corbin Farm* and *FMC Corp.* courts both easily found that "poison" could be a derivative of

59. *United States v. Moon Lake Elec. Ass'n, Inc.*, 45 F. Supp. 2d 1070, 1078 (D. Colo. 1999).

60. *Id.* at 1074 (where the United States prosecuted the utility company for violating the MBTA and the Bald and Golden Eagle Protection Act because the power poles used by the company were not fitted with equipment that might have prevented bird deaths due to perching and roosting on those poles) (emphasis added).

61. *See Evans*, 952 F.2d at 303.

62. *United States v. FMC Corp.*, 572 F.2d 902, 907-08 (2d Cir. 1978); *United States v. Corbin Farm Serv.*, 444 F. Supp. 510, 531-32 (E.D. Cal. 1978).

63. MICHAEL J. BEAN & MELANIE J. ROWLAND, *THE EVOLUTION OF NATIONAL WILDLIFE LAW* 80 (3d ed. 1997).

“take.”⁶⁴ It is strange that the *Evans* court is so literal on the one hand, and so expansive on the other. A better and more consistent approach would have been to follow the lead of *Andrus v. Allard*, where the Supreme Court stated that “[r]elated statutes may sometimes shed light upon a previous enactment.”⁶⁵

The court in *Mahler* takes a different approach to arguing that only actions that directly lead to deaths are applicable. The *Mahler* court is straightforward in its recognition of the plain language of the statute, stating that the plaintiff’s

argument for broad application of the MBTA admittedly draws substantial support from the statutory language and from case law developed in criminal cases brought by agencies of the United States government other than the Forest Service. The statutory language says, after all, that it is “unlawful at any time, *by any means or in any manner*, to . . . kill . . . any migratory bird.”⁶⁶

The court however still refused to give effect to that plain language, and instead turned to the legislative history for support of an alternative theory that MBTA violations are confined to hunting/poaching related activities.⁶⁷ This is a mistaken approach, however, since where statutory language is “plain and unambiguous it must be given effect.”⁶⁸

Furthermore, the *Mahler* court’s reliance on legislative history is misguided for another reason. The *Mahler* court relies on the theory that the legislative history surrounding the Act does not suggest that such a broad interpretation of the statute, one which would include the incidental taking of birds through habitat destruction, was intended by Congress. Instead, the *Mahler* court argues that the 1918 Congress only intended the MBTA to focus on hunting, trapping, and commercial trafficking in migratory birds,⁶⁹ even though many of the bird species protected by the statute have never been the targets of any of these activities.⁷⁰

64. *FMC Corp.*, 572 F.2d at 907-08; *Corbin Farm Serv.*, 444 F. Supp. at 531-32.

65. 444 U.S. 51, 62 (1979) (finding that certain prohibitions found in the ESA could be attributed to the MBTA as well).

66. *Mahler v. U.S. Forest Serv.*, 927 F. Supp. 1559, 1576 (S.D. Ind. 1996) (quoting 16 U.S.C. § 703).

67. *Id.* at 1580-81.

68. See generally, Karl Llewellyn, *Remarks on the Theory of Appellate Decision and the Rules or Canons About How Statutes Are to Be Construed*, 3 VAND. L. REV. 395, 401-05 (1950).

69. See *Mahler*, 927 F. Supp. at 1580.

70. See *United States v. Moon Lake Elec. Ass’n, Inc.*, 45 F. Supp. 2d 1070, 1081 (D.

The court in *Moon Lake* points out that there are several examples in the statute's legislative history which prove that Congress did contemplate the fact that the MBTA would apply to a very broad range of activities.⁷¹ As the *Moon Lake* court states: "there is no clearly expressed legislative intent that the MBTA regulates only physical conduct associated with hunting or poaching."⁷² Furthermore, several of the congressmen involved in the initial passage of the MBTA clearly stated that they felt that the prohibitions of the MBTA would apply to habitat as well.⁷³

Several courts also argue that habitat destruction could not

Colo. 1999) (quoting 56 CONG. REC. 7453 (June 6, 1918) (statement of Rep. Green: "What are the enemies of insectivorous birds? Not anybody in my State or elsewhere hunts insectivorous birds.")). The *Moon Lake* court also refers to 50 C.F.R. § 10.13 "listing approximately 925 protected bird species, many of which are not game birds and have not been hunted, traditionally, by humans." *Id.* at 1082.

71. *Moon Lake*, 45 F. Supp. 2d at 1080-82. See the following selection of congressional statements cited by the *Moon Lake* court:

"Nobody is trying to do anything here except to keep pothunters from killing game out of season, ruining the eggs of nesting birds, and ruining the country by it." 55 CONG. REC. 4816 (July 9, 1917) (statement of Sen. Smith). Senator Smith clearly was concerned with protecting eggs and nests, as well as with regulating hunting and poaching.

"[T]he extension of agriculture, and particularly the draining on a large scale of swamps and meadows, together with improved firearms and a vast increase in the number of sportsmen, have so altered conditions that comparatively few migratory game birds nest within our limits." H.R. NO. 65-243, at 2 (1918) (letter from Secretary of State Robert Lansing to the President). This statement clearly demonstrates concern over habitat destruction as well as hunting.

"If we are going to have a treaty about migratory birds, let us have some place where they can come and remain safely and be a pleasure and companions." 56 CONG. REC. 7458 (June 6, 1918) (statement of Rep. Smith).

If the Secretary . . . does not want you to do so, *you will never kill another duck or any bird protected by this bill*, whether it is a game bird or not. Therefore, it seems to me that we ought not to adopt the bill. *It is too far reaching* . . . [T]he bill provides that it shall be unlawful to take any bird or have in possession any part of a bird except in accordance with regulations adopted by the Secretary . . .

56 CONG. REC. 7364 (June 14, 1918[sic]) (statement of Rep. Huddleston) (emphasis added). Clearly Congress contemplated the very breadth that the *Mahler* court and others find absurd. Yet it is not for the court to strike down a statute for "absurdity," especially where that absurdity does not offend the Constitution, if Congress finds the rationale to be reasonable.

Senator Reed described the MBTA as "absolutely prohibiting the killing of game anywhere *under any circumstances*." 55 CONG. REC. 4399 (June 28, 1917) (statement of Sen. Reed) (emphasis added).

72. *Moon Lake*, 45 F. Supp. 2d at 1082.

73. *Id.* at 1080-82. See the following selection of congressional statements cited by the *Moon Lake* court:

"[T]he extension of agriculture, and *particularly the draining on a large scale of swamps and meadows*, together with improved firearms and a vast increase in the number of sportsmen, have so altered conditions that comparatively few migratory game birds nest within our limits." H.R. NO. 65-243, at 2 (1918) (letter from Secretary of State Robert Lansing to the President) (emphasis added). This statement clearly demonstrates concern over habitat destruction as well as hunting.

"If we are going to have a treaty about migratory birds, *let us have some place where they can come and remain safely* and be a pleasure and companions." 56 CONG. REC. 7458 (June 6, 1918) (statement of Rep. Smith) (emphasis added).

have been intended as a violation of the MBTA because such an interpretation would hamper the statutory goals set out for the Forest Service.⁷⁴ According to the *Mahler* court, “[m]any other statutes enacted in the intervening years also counsel against reading the MBTA to prohibit any and all migratory bird deaths resulting from logging activities in national forests.”⁷⁵ Similarly, in *Sierra Club v. Martin*, the court stated,

In 1897, Congress established the National Forest System “[t]o conserve the water flows, and to furnish a continuous supply of timber for the people.” In light of that purpose, it is difficult to imagine that Congress enacted the MBTA barely twenty years later intending to prohibit the Forest Service from taking or killing a single migratory bird or nest “by any means or in any manner” given that the Forest Service’s authorization of logging on federal lands inevitably results in the deaths of individual birds and destruction of nests.⁷⁶

Yet the court in *Pirie* found that the Navy’s incidental take was a violation of the statute, and the FWS agreed, though the agency decided not to prosecute. The legislation animating the Department of Defense undoubtedly contemplates the notion that the Department would need to conduct all manner of training exercises. Yet, the court, the FWS, the Navy (which did try to apply for a permit), and Congress⁷⁷ all agreed that the MBTA’s rules extended to the incidental take of birds even during activities that form part of the core mission of the government. Why should Forest Service legislation protect that agency from compliance with the MBTA when such an argument could not work for other federal agencies undertaking critical services to this country? Such a result would be absurd and should be avoided.

In *Robertson v. Seattle Audubon Society*,⁷⁸ the Supreme Court, in dictum, stated that the Forest Service only had two options to

74. See *Mahler*, 927 F. Supp. at 1581-82 (explaining that finding for plaintiff here would “upset the balance established by these other laws by giving absolute priority to the life of a single bird. That would effectively eliminate the Forest Service’s ability to provide timber resources for production, at least for several months of every year.”).

75. *Id.* at 1581.

76. *Sierra Club v. Martin*, 110 F.3d 1551, 1555-56 (11th Cir. 1997) (citation omitted).

77. After all, Congress felt there was a need to pass a new law forcing the FWS to create regulations on incidental take in order to facilitate the Navy’s training. Congress could just as easily have instead inserted a new clause into the MBTA explicitly stating that the federal government could not violate the MBTA through incidental take.

78. 503 U.S. 429 (1991).

satisfy its obligations under the MBTA in relation to the logging operation in question. The agency could comply with section 318 of the Department of the Interior and Related Agencies Appropriations Act of 1990,⁷⁹ the legitimacy of which was in question, or the agency could ensure that it managed its lands so that no migratory birds were killed or taken “within the meaning of § 2” of the MBTA.⁸⁰ While the court says nothing about what would and would not violate section 2, this statement at least leaves open the possibility that the Forest Service’s logging operation might in fact violate the act. The line between direct and indirect deaths, as drawn by the courts to discount activities that destroy habitat, is ultimately arbitrary and bears no relationship to the language, history, or purposes of the MBTA.

Finally, the *Evans* court stated that the other non-intentional bird death cases (i.e., *United States v. FMC Corp.*, *United States v. Corbin Farm Serv.*, etc.) were “inapposite” to the logging case before them because “[t]hese cases do not suggest that habitat destruction, leading indirectly to bird deaths, amounts to the ‘taking’ of migratory birds within the meaning of the Migratory Bird Treaty Act.”⁸¹ The *Evans* court however did not examine the high likelihood of *direct* bird deaths and egg and nest destruction that would result from the Forest Service’s planned operations. Therefore, perhaps the *Evans* court was correct, and indirect bird deaths are not a violation of the MBTA (though many would disagree). However, that does not prevent logging and other land clearing practices from being covered by the language of the MBTA.

C. Habitat Destruction Does Result in Direct Bird Deaths

Even if we accept the division between direct and indirect bird deaths as a legitimate part of the MBTA, the courts making this distinction still failed to properly enforce the statute. Some of the most relevant consequences of logging and land clearing during nesting season are the *direct* deaths and woundings of adult and fledgling birds and the destruction of eggs and nests. Several litigants have tried to raise this point in various cases,⁸² but courts,

79. Pub. L. No. 101-121, 103 Stat. 701 (1990) (stating that meeting the requirements of section 318 was adequate for the agency to meet its obligations under the MBTA and other environmental statutes for certain lands in Oregon and Washington).

80. *Robertson*, 503 U.S. at 438.

81. *Seattle Audubon Soc’y v. Evans*, 952 F.2d 297, 303 (9th Cir. 1991).

82. See, e.g., *City of Sausalito v. O’Neill*, 386 F.3d 1186 1225 (9th Cir. 2004) (“Sausalito asserts that implementation of the Fort Baker Plan will violate the MBTA because migratory birds’ nesting trees will be cut down, thereby disturbing both birds and their nests.”). But the court examined this solely as a problem of habitat destruction which might

for the most part, have overlooked this aspect of the claims, and have simply failed to address it.

Mahler is the only case which deals with this issue directly. The *Mahler* court, however, avoided finding an MBTA violation by relying on several of the arguments already discredited above.⁸³ In general, the courts have been overbroad when eliminating all logging and other land alteration practices from MBTA review because those activities only “indirectly” cause bird deaths. It is true that in a broad sense habitat destruction would indirectly harm birds by decreasing available breeding, feeding, and nesting areas. But upon closer inspection we see that logging, road building, land clearance, and other habitat alteration activities also directly kill many migratory birds. Fledglings, eggs, and nests, all protected by the statute, are the most obvious victims; but adult birds may also be injured and killed during major habitat destruction activities.

The exception the courts have created (that habitat destruction is not covered by the statute) is so large and vague, that it swallows the rule. The courts do not consider the fact that habitat destruction, such as removal of trees or the grading of land, when nests are present, means that nests will be destroyed and fledglings will die just as assuredly as they would have if a federal employee plucked them out of the nest and euthanized them. Furthermore, there is nothing to stop enterprising agency officials from recasting every activity as “habitat destruction.” For instance, the court has told the Department of Defense that live-fire training exercises without a FWS permit violate the MBTA.⁸⁴ But, if the training were re-classified as major re-landscaping, would a court no longer require the permit because this was merely habitat destruction?

Common sense should tell you that if you fell a tree that con-

eventually lead “indirectly to bird deaths.” Additionally, in *Martin*, “Sierra Club asserted that the Forest Service’s timber contracts violate the MBTA because they allowed timber cutting during the migratory bird nesting season and that tree cutting during nesting season would directly kill at least 2,000 to 9,000 neotropical migratory birds.” *Sierra Club v. Martin*, 110 F.3d 1551, 1553 (11th Cir. 1997). The court, however, focused its analysis on whether the MBTA subjects the federal government to its prohibitions. In *Newton County Wildlife Ass’n v. United States Forest Service*, “the Wildlife Association allege[d], and the Forest Service concede[d], that logging under the timber sales [would] disrupt nesting migratory birds, killing some.” 113 F.3d 110, 115 (8th Cir. 1997). The court, however, focused on whether strict liability could be applied under the MBTA, and whether the MBTA could be applied in this manner to the federal government.

83. *Mahler v. U.S. Forest Serv.*, 927 F. Supp. 1559, 1573-83 (S.D. Ind. 1996) (finding, for example, that unintentional take is not a violation of the statute, that Congress could not have meant to include the Forest Service’s activities within the actions that might be violations, and that the MBTA did not intend to control activities that affect birds beyond hunting and poaching).

84. *See Ctr. for Biological Diversity v. Pirie*, 191 F. Supp. 2d 161, 174 (D.D.C. 2002).

tains a nest full of eggs, both the eggs and the nest will likely be destroyed.⁸⁵ The same logic would tell you that driving heavy machinery and land graders over an area used by ground-nesting birds, during nesting season, will kill fledglings in those ground nests, as well as destroy the nests and eggs.⁸⁶ These are direct bird deaths, not displacement or projected future declines due to habitat loss. This is birds, nests, and eggs (all protected by the MBTA) being crushed.⁸⁷ The courts, with the exception of *Mahler*, have refused to acknowledge this truth, and the *Mahler* court avoids acting upon it by stretching the understanding of the MBTA beyond reason.

As stated above, it is telling that only the Department of Defense and the Department of Energy have so far completed an MOU with FWS under the Executive Order. Other agencies have not yet had their activities, or the activities of their major constituents, seriously affected by the loss of a major court case, and therefore, may not feel the same pressure to comply strictly with the MBTA. But as time progresses, and federal land clearance during nesting season continues, it becomes more and more likely that other agencies will be similarly targeted by lawsuits. This could lead to greater compliance both with the Act and with the Executive Order. However, it would be far more efficient if more proactive measures were taken instead.

While the government's reliance on cases like *Evans* may be understandable, it is important for agencies to recognize that their positions are not secure, but rather that they are violating the MBTA and may be in jeopardy from citizen lawsuits, as the Navy was. To ensure that other agencies are meeting the requirements of the statute, and to ensure that the courts interpret the statute appropriately, FWS must provide regulatory guidance. Part of that guidance ought to incorporate the recommendation made by the plaintiff in the *Mahler* case: "harvesting trees during nesting sea-

85. *Martin*, 110 F.3d at 1553 (noting that "[t]he Forest Service did not dispute that cutting down a tree with an active nest directly killed migratory birds").

86. The MBTA uses the term "to kill" as part of the definition of "take." "Kill" in turn means "to destroy or ruin." See *United States v. Moon Lake Elec. Ass'n, Inc.*, 45 F. Supp. 2d 1070, 1078 (D. Colo. 1999) (quoting WEBSTER'S NEW INTERNATIONAL DICTIONARY OF THE ENGLISH LANGUAGE 1185 (1st ed. 1920)). The court notes that this was part of the definition of "kill" at the time the MBTA was passed.

87. A Forest Service memorandum noted that tree cutting during nesting season would kill migratory birds: "The loss of individual nests and or birds is an un-avoidable cost of any type of land management activity, whether it be agricultural plowing, mowing, road maintenance, lawn maintenance, clearing land for construction, or cutting trees."

Martin, 110 F.3d at 1553 n.7.

son would cause 'direct takings' of migratory [bird] in violation of the MBTA . . . [t]o comply with the MBTA, the Forest Service has only to avoid cutting the sale while migratory birds are nesting."⁸⁸ This argument would work for any federal agency occupied in any type of land clearance during the nesting season.

IV. CONGRESS

The fact that Congress has never amended the statute to deal with this problem, even though Congress has amended the MBTA several times over the years for other purposes, does not support the position of either side, though that fact has been used by both sides.⁸⁹ For instance, the *Mahler* court spends a great deal of time enumerating all the instances in which Congress amended the MBTA but never included an explicit prohibition against incidentally killing migratory birds.⁹⁰ To counter this argument, the *Moon Lake* court notes that in all the time since the passage of the statute, Congress has also not amended the MBTA to exclude the possibility that incidental take⁹¹ was a violation of the statute, though Congress surely knew that such interpretations were being made by certain courts.⁹² Congress has surely been aware of the fact that the incidental taking of birds by federal agencies has been found to be a violation of the MBTA by some courts, and not by others. The fact that Congress has failed to endorse either interpretation continues to be Congress's failure. One is bound to come to the conclusion that Congress has abandoned its responsibility in this matter.

88. *Mahler*, 927 F. Supp. at 1575 (citation omitted).

89. See, e.g., *Mahler*, 927 F. Supp. at 1580-81; *Portland Audubon Soc'y v. Lujan*, No. 87-1160-FR, 1991 U.S. Dist. LEXIS 6224 (D. Or. May 8, 1991); *In re Bar First Go Round Salvage Sale*, 121 IBLA 347, 351-52 (1991) (citing cases that rely on the principle that although the MBTA has been amended several times over its history, "habitat destruction," or terminology that implies that idea, has never been added to the list of definition of "take," and hence Congress could not have intended that outcome); see also *Moon Lake*, 45 F. Supp. 2d at 1077 (relying on the principle that since the MBTA has been amended several times over its history, but Congress has never repudiated the cases which find violations due to incidental takes including habitat destruction, such as reduced water quality, then Congress must have intended such a result).

90. *Mahler*, 927 F. Supp. at 1580-81. Several other courts have made similar arguments. See, e.g., *Portland Audubon Soc'y v. Lujan*, No. 87-1160-FR, 1991 U.S. Dist. LEXIS 6224, at *17-18 (D. Or. May 8, 1991).

91. *Moon Lake*, 45 F. Supp. 2d at 1077. Or for that matter, bird deaths beyond those caused by hunters and poachers.

92. "Just as 'Congress is presumed to enact legislation with knowledge of the law' . . . such that 'absent a clear manifestation of contrary intent, a newly-enacted or revised statute is presumed to be harmonious with existing law and its judicial construction.'" *United States v. Boynton*, 63 F.3d 337, 343 (4th Cir. 1995) (quoting *United States v. Langley*, 62 F.3d 602 (4th Cir. 1995)). See also *Moon Lake*, 45 F. Supp. 2d at 1075.

V. A PERMANENT SOLUTION

The FWS is currently working on a regulatory solution to this problem, though it is not clear what form those regulations will take.⁹³ Demanding that the FWS require a permit for every federal activity which might incidentally take birds would be impractical; such an approach would overburden an already overextended agency and would not likely lead to the desired conservation benefits. At the other end of the spectrum, a blanket authorization allowing land clearance without oversight would allow federal agencies to continue to negatively impact migratory bird populations, violating the treaties upon which the MBTA stands. A middle-of-the-road approach is required here. I offer the following regulatory recommendations to the FWS that would meet the nation's obligations under the treaties, protect migratory bird populations, and meet the development needs of the various agencies and their constituencies, without overburdening the FWS.

First, the FWS ought to develop regulations that outright ban land disturbance activities during nesting season in areas that are known to, or are likely to, contain active nests.⁹⁴ These regulations should be established by region, as there are likely to be large variations nationwide. Incidental take, while not currently strictly enforced by the FWS, is already a violation of the statute, so such a regulation would really just be highlighting when such a violation is most likely to occur. It would not be a tightening of restrictions as many might claim, but rather regulatory guidance on how best to realize the intent of the MBTA. Additionally, if activity does need to take place during nesting season, as may reasonably be the case in Alaska, a process similar to the one suggested in the Executive Order⁹⁵ would be appropriate.

Second, the FWS should require that each agency evaluate the likely effects of its own activities—something agencies are required to do under the National Environmental Policy Act already. If the proposed action will have, “or [is] likely to have, a measurable negative effect on migratory bird populations,”⁹⁶ then that agency should have to consult with the FWS before moving forward. The FWS could help the agency to alter its plans and/or develop miti-

93. Interview with Marie Strassburger, Branch Chief of Bird Conservation Branch, Div. of Migratory Bird Mgmt., FWS (May 21, 2007).

94. Such an approach has been proposed by the Navy and by the FWS. *See* Ctr. for Biological Diversity v. Pirie, 191 F. Supp. 2d 161, 166 (D.D.C. 2002); FWS Advisory, *supra* note 4.

95. *See* Exec. Order No. 13,186, 66 Fed. Reg. 3853 (Jan. 10, 2001).

96. *Id.* at 3854, § 3(a).

gation measures to alleviate that result.⁹⁷ If mitigation is not possible, and the FWS feels that the effects would be too severe on the bird population in question, then the FWS could refuse to permit the activity. If the agency goes forward with the activity anyway, that agency would be in violation of the MBTA.⁹⁸ If the proposed action is not anticipated to have a measurable negative effect⁹⁹ on migratory bird populations then the action agency may simply go forward as planned, but must notify the FWS of its plans and the conclusions of its analysis. In this way, the FWS may be able to detect flaws in the analyses and prevent measurable harm. More importantly, in this way the FWS can be kept abreast of which bird populations are being impacted, when, to what extent, and by what types of activities. This would allow the FWS to do cumulative impact analyses which might reveal larger effects on bird populations than may be revealed by a narrower focus on a single project. In this way, there is some flexibility built-in for agency action, but birds, nests, and eggs are largely protected, and the FWS is able to play an active supervisory/advisory role as was intended by the MBTA.

VI. CONCLUSION

My intention here is not to prevent logging, land clearing, or other construction and development activities. Even if such were my intention it would not be feasible. The point of this exercise is

97. The Executive Order states that “[w]ith respect to those actions . . . identified [as likely to have measurable negative effects], the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the [Fish and Wildlife] Service.” *Id.* at 3855, § 3(e)(9).

98. “Unless and except as permitted by regulations . . . it shall be unlawful at any time, by any means or in any manner, to . . . take . . . any migratory bird” 16 U.S.C. § 703(a).

99. The phrase “measurable negative effect” is employed, but never defined, by the Executive Order. *See* Exec. Order No. 13,186, 66 Fed. Reg. at 3854, § 3(a). An alternative standard to apply might be “significant adverse effect” which is used in the FWS regulations for authorization of take incidental to military readiness activities. 50 C.F.R. § 21.15(a)(1) (2007). This phrase is defined by FWS as:

Significant adverse effect on a population, as used in § 21.15, means an effect that could, within a reasonable period of time, diminish the capacity of a population of migratory bird species to sustain itself at a biologically viable level. A population is “biologically viable” when its ability to maintain its genetic diversity, to reproduce, and to function effectively in its native ecosystem is not significantly harmed. This effect may be characterized by increased risk to the population from actions that cause direct mortality or a reduction in fecundity.

50 C.F.R. § 21.3 (2007). Obviously the criteria chosen and the definitions used will have a great deal of impact on the outcome of the success of this program. While suggested criteria were provided here, the final criteria applied ought to be determined by wildlife biologists.

to demonstrate that the agencies are currently leaning on a thin reed. Federal agencies must truly take the precepts of the MBTA to heart. It is clear that Congress recognized the breadth of the actions that might be prohibited by the language of the statute.¹⁰⁰ Since the passage of the statute, much has changed as far as our environmental awareness and scientific understanding of the effects that previously acceptable practices could have on bird populations. If Congress now wishes to limit the broad language so that it does not encompass such actions Congress needs to amend the statute, but it has not yet done so. The FWS must recognize the fact that it is the gatekeeper for proper implementation of the statute. Incidental taking by land clearance must not be allowed to continue unchecked and unmonitored. Migratory birds are its trust, and FWS' regulatory efforts today could help preserve these species for the future, as well as maintain our international responsibilities.

100. *See supra* note 71.

INSURING AGAINST ENVIRONMENTAL UNKNOWNNS

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I. INTRODUCTION

The Florida Department of Environmental Protection (FDEP), the United States Environmental Protection Agency (EPA), as well as other state, federal, and even local government agencies have stepped up their enforcement activities and broadened the reach of environmental laws and regulations in recent years. At the same time, as the number of people moving to Florida increases and more property is developed, due diligence investigations reveal an array of environmental problems associated with all types of land uses be it agricultural, industrial, or commercial. In many instances, land is being converted from one or more of these uses to residential use. In addition, environmental science and, particularly, risk assessment have developed more sophisticated analytical and evaluative techniques to determine the scope and extent of impacts to human health and the environment. In response to these developments, the Environmental Risk Transfer (ERT) and insurance industries have emerged to provide alternatives for potentially responsible parties (PRPs) to address these issues.

In particular, two recent developments in Florida have the po-

tential to increase the number of lawsuits brought against owners of contaminated property causing off-site impacts on neighboring property. First, the FDEP promulgated the Global Risk-Based Corrective Action (Global RBCA) rule, which provides for the use of risk-based corrective action in the remediation of contaminated property.¹ On its face, the application of risk-based corrective action principles does not appear to increase an owner's exposure to a third-party suit. Upon closer reading, however, the highly contested notice provisions contained in the final rule will raise the public profile of numerous sites causing off-site impacts.² Second, in *Aramark Uniform and Career Apparel, Inc. v. Easton*, the Florida Supreme Court held that section 376.313 of the Florida Statutes creates a private cause of action imposing strict liability for damages against an adjoining landowner without proof that the adjoining landowner actually caused the pollution.³ Amidst these concerns lies the EPA's All Appropriate Inquiries (AAI) rule,⁴ adopted on November 1, 2006, which delineates the requirements of conducting environmental due diligence and is used by purchasers to avail themselves of defenses provided under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).⁵ Together, these developments have created a legal framework that will expose many property owners to increased liability for third-party claims for property damages.

This Article will analyze these recent developments in Florida and will provide an overview of the challenges facing PRPs, purchasers of contaminated property, owners of contaminated property, and the various ERT and insurance options available to them to insure against environmental unknowns.

II. THE INADEQUACY OF CGL POLICIES

Historically, businesses purchased standardized liability insurance, called comprehensive general liability (CGL) insurance, which provided broad-based coverage for all liabilities not specifically excluded in the policy.⁶ Revisions to the standard form CGL

1. FLA. ADMIN. CODE ANN. r. 62-780.220 (2005).

2. *See id.*

3. 894 So. 2d 20, 28 (Fla. 2004).

4. 70 Fed. Reg. 66070 (Nov. 1, 2005) (to be codified at 40 C.F.R. pt. 312).

5. 42 U.S.C. §§ 9601-9675 (2000).

6. 4 SUSAN M. COOKE, *THE LAW OF HAZARDOUS WASTE: MANAGEMENT, CLEANUP, LIABILITY, AND LITIGATION* § 19.01[2], at 19-12 (1993). The authors would like to point out that the descriptions of insurance policies and coverage contained in this Article are based upon information available to the authors as of the writing of this Article, and they urge the reader to contact the insurers mentioned in this Article directly for current information on the policies and analysis of such described in this Article.

policy over the last forty years, however, have all but eliminated coverage for environmental liabilities. Increased social awareness of exposure to environmental hazards and legislative responses to those concerns spurred these changes to the CGL policy. Specifically, the federal government passed many significant pieces of environmental legislation, including CERCLA and the Resource Conservation and Recovery Act (RCRA),⁷ which forced businesses to bear the cost of remedying harmful environmental conditions they helped create. These businesses, accustomed to having all of their liabilities covered under one policy, expected these new environmental liabilities to be covered under their CGL policies. However, the insurance industry, overwhelmed by the number and cost of claims by insureds that were liable under these statutes, amended the standard form CGL policy to specifically exclude environmental liabilities.⁸ First, in 1973, the insurance industry added the “sudden and accidental” pollution exclusion, which excluded from coverage any pollution events not sudden and accidental.⁹ However, this attempt by the insurance industry to limit pollution liability spawned a massive amount of litigation concerning the meaning of that phrase. The most significant change to the standard form CGL policy occurred in 1985, with the addition of the “absolute pollution exclusion.”¹⁰ As its name implies, the absolute pollution exclusion sought to exclude coverage for losses attributable to environmental pollution.

Prior to the addition of the absolute pollution exclusion, policyholders tried to argue in court that the sudden and accidental pollution exclusion in the CGL policy provided coverage for liability resulting from pollution events as long as they were not expected or intended.¹¹ The policyholders’ key argument in this respect was that sudden was synonymous with accidental.¹² The insurance

7. 42 U.S.C. §§ 6901-6992 (2000).

8. Nancer Ballard & Peter M. Manus, *Clearing Muddy Waters: Anatomy of the Comprehensive General Liability Pollution Exclusion*, 75 CORNELL L. REV. 610, 612 (1990).

9. *Id.* The standard 1973 CGL pollution exclusion clause provides that coverage: does not apply . . . to bodily injury or property damage [arising out of pollution or contamination caused by oil or] arising out of the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids or gases, waste materials or other irritants, contaminants or pollutants into or upon land, the atmosphere or any water course or body of water; *but this exclusion does not apply if such discharge, dispersal, release or escape is sudden and accidental.*

Id. at 613 (citing Insurance Services Office (ISO) Form GL 00 02, Ed. 0173).

10. *Id.*; see also KENNETH S. ABRAHAM, ENVIRONMENTAL LIABILITY INSURANCE LAW 161 (1991).

11. Allstate Ins. Co. v. Klock Oil Co., 73 A.D.2d 486, 488 (N.Y. App. Div. 1980).

12. Am. Motorists Ins. Co. v. Gen. Host Corp., 667 F. Supp. 1423, 1427 (D. Kan. 1987).

industry, on the other hand, argued that sudden was distinct from accidental and should be interpreted temporally such that pollution events which occurred gradually should be excluded from coverage.¹³ While courts initially sided with policyholders regarding the interpretation of the sudden and accidental exclusion, over time, more courts began to reject their arguments, closing the door to environmental liability claims under the CGL policy.¹⁴

In Florida, the seminal case precluding coverage for environmental liabilities under the CGL policy is *Dimmitt Chevrolet, Inc. v. Southeastern Fidelity Insurance Corp.*¹⁵ In *Dimmitt*, a car dealer and oil treatment company were notified by the EPA that they were potentially responsible for cleanup costs resulting from the oil treatment company's operations at its plant.¹⁶ The oil treatment company disposed of waste oil sludge in unlined storage ponds on its property, causing contamination of groundwater.¹⁷ The car dealer, who sold used oil to the oil treatment company, was strictly liable under CERCLA, as CERCLA imposes liability on "anyone who generates, transports, or disposes of hazardous substances."¹⁸ The car dealer, however, was insured under a CGL policy containing a sudden and accidental pollution exclusion during the period in which the car dealer sold its used oil to the oil treatment company.¹⁹ The issue before the Florida Supreme Court was whether the sudden and accidental exclusion in the policy precluded coverage.²⁰

In ruling that coverage under the CGL policy was excluded, the court rejected the policyholder's contention that the phrase "sudden and accidental" was ambiguous and should therefore be interpreted in favor of the insured.²¹ The court noted that to construe the term 'sudden' as synonymous with 'accidental' would render

13. *Claussen v. Aetna Cas. & Sur. Co.*, 259 Ga. 333, 335 (1989).

14. *See, e.g., Dimmitt Chevrolet, Inc. v. Se. Fid. Ins. Corp.*, 636 So. 2d 700, 711 (Fla. 1993).

15. *Id.*

16. *Id.* at 701.

17. *Id.*

18. *Id.*

19. *Id.* at 702. The policy covered Dimmitt for all sums it was obligated to pay as a result of bodily harm or property damage caused by an occurrence, which was defined in the policy "as an accident including continuous or repeated exposure to conditions . . . neither expected nor intended." *Id.* But, the policy excluded coverage for "BODILY INJURY or PROPERTY DAMAGE arising out of the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids, or gases, waste materials . . . into or upon land, the atmosphere or any water course or body of water." *Id.* However, this exclusion did not apply "if such discharge, dispersal, release or escape [was] sudden and accidental." *Id.*

20. *Id.* at 701.

21. *Id.* at 704.

both words redundant.²² The court also noted that the ordinary and common usage of the word ‘sudden’ implies a temporal notion of immediacy or abruptness.²³ Thus, the Court held that the sudden and accidental pollution exclusion was not ambiguous and, therefore, the gradual pollution on the oil treatment site for which the car dealer was liable was not covered under the CGL policy.²⁴ As a result of *Dimmitt* and similar cases, a gap in coverage under the CGL policy formed and created the need for specialized environmental liability insurance.

III. GLOBAL RBCA

In 2003, the Florida Legislature passed Committee Substitute for House Bill 1123,²⁵ commonly referred to as Global RBCA,²⁶ which was signed into law by Governor Bush on June 20, 2003.²⁷ Global RBCA extended the use of risk-based corrective action to all contaminated sites resulting from a discharge of pollutants or hazardous substances where legal responsibility for site rehabilitation exists pursuant to other provisions of chapters 376 and 403.²⁸ Risk-based corrective action is not a new principle but has been used for several years in Florida at contaminated sites under the supervision of specific FDEP programs, namely: the Petroleum Program,²⁹ the Brownfield Program,³⁰ and the Drycleaning Facility Restoration Program.³¹ Risk-based corrective action utilizes site-specific data, modeling results, risk assessment studies, institutional controls (i.e., a deed restriction limiting future use to industrial only), engineering controls (i.e., placing an impervious surface over contaminated soils to prevent human exposure), or any combination thereof, to develop a unique remediation strategy for the site that considers the intended use of the property and aims to protect human health and safety and the environment. Based upon this information, risk-based corrective action may incorporate engineering controls, institutional controls, or even alternative cleanup target levels, to achieve a “No Further Action”

22. *Id.*

23. *Id.*

24. *Id.* at 704-05.

25. Act effective June 20, 2003, ch. 2003-173, 2003 Fla. Laws 1125 (codified at FLA. STAT. § 376.30701 (2005)).

26. RBCA is generally pronounced like “Rebecca.”

27. FLA. STAT. § 376.30701 (2005).

28. *See id.*

29. *Id.* §§ 376.3071-.3072.

30. *Id.* §§ 376.78-.875.

31. *Id.* §§ 376.3078-.3081.

determination from FDEP.³²

Prior to the introduction of risk-based corrective action at non-program sites, contamination at a site was typically remediated to the default Cleanup Target Levels (CTLs) contained in Table II of rule 62-777.170, at which point site rehabilitation would typically be deemed complete.³³ Consequently, there was little flexibility to provide for site-specific remediation strategies. For example, the soil CTLs are flexible only to the extent that there are two sets of default cleanup target levels: one set for property that will be used for residential purposes following remediation,³⁴ and the other for sites that are to be used for industrial purposes following remediation.³⁵ Furthermore, the soil CTLs are highly conservative and were developed based on the assumption that individuals will be at their residence for 350 days per year and live at the same place for thirty (30) years, or in the case of industrial property, that a worker will spend 250 days per year and twenty-five (25) years at the same workplace.³⁶ As such, contaminated property was often remediated to conservative residential or industrial levels even though actual exposure would, in reality, be far less than the assumed exposure. Consequently, remediation was often inefficient and overly expensive. Risk-based corrective action provides for a flexible site-specific cleanup that reflects the intended use of the property following cleanup, while maintaining adequate protection of human health and safety and the environment through the evaluation of the toxicity of the contamination and the exposure pathways by which human and environmental receptors may be exposed. This may result in significant cost savings during remediation, leading to more efficient cleanups, and more properties being remediated.

Shortly after the statute became effective, FDEP commenced what was to become a lengthy and contentious rulemaking process designed to implement the provisions of Global RBCA. Some of the most vigorous debates during the rulemaking process concerned the notice provisions which required owners of contaminated property, upon the discovery of contamination beyond their

32. *Id.* § 376.30701(2) (enabling rulemaking authority of the Department of Environmental Protection).

33. FLA. ADMIN. CODE ANN. r. 62-777.170, tbl. II (2005); *see also id.* at 62-770.200(7) (2006).

34. *Id.* at r. 62-777.170, tbl. II (2005).

35. *Id.*

36. CTR. FOR ENVTL. & HUMAN TOXICOLOGY, UNIV. OF FLA., FINAL TECHNICAL REPORT: DEVELOPMENT OF CLEANUP TARGET LEVELS (CTLs) FOR CHAPTER 62-777, F.A.C. 73 (Feb. 2005), [http://www.dep.state.fl.us/waste/quick_topics/publications/wc/FinalGuidanceDocumentsFlowCharts_April2005/TechnicalReport2FinalFeb2005\(Final3-28-05\).pdf](http://www.dep.state.fl.us/waste/quick_topics/publications/wc/FinalGuidanceDocumentsFlowCharts_April2005/TechnicalReport2FinalFeb2005(Final3-28-05).pdf).

property boundaries, to notify neighboring property owners that pollutants had been discovered on or under their property.

The proposed rule developed for the first rulemaking workshop was published in August 2004 and dramatically increased then existing notice requirements.³⁷ These new notice provisions were developed in response to criticism of FDEP's actions in certain high profile cases in which property owners had not been notified of the migration of contamination from neighboring sites onto their property.³⁸ Originally, FDEP proposed the requirement of verbal notice to affected property owners within three days of discovery of off-site migration of contaminants.³⁹ Additionally, constructive notice was to be provided to residents and business tenants of any real property into which contamination migrated from the source property by publishing a "notice, at least 16 square inches in size, in a newspaper of general circulation in the area."⁴⁰

FDEP eventually modified these proposed notice provisions to require written notice to FDEP within ten days of the confirmed discovery (i.e., laboratory analytical data) of contamination on property beyond the boundaries of the property that is the subject of site rehabilitation activities.⁴¹ The final rule, which became legally effective on April 17, 2005, also sets out the specific information that is to be included when providing such notice to FDEP.⁴²

In response to the events at the Tallevast facility, and the impact on his constituents, State Representative Bill Galvano sponsored a bill which essentially mirrored the notification requirements in Global RBCA.⁴³ Committee Substitute for House Bill 937, often referred to as the Tallevast Bill, was signed into law by

37. See Fla. Dep't of Env'tl. Prot., Combined Rule Workshop (Aug. 3, 2004), <http://www.dep.state.fl.us/waste/categories/wc/pages/August032004Workshop.htm> (last visited Nov. 14, 2007).

38. See, e.g., Deborah Alberto, *DEP Investigates Itself in Handling of Coronet*, TAMPA TRIB., Sept. 24, 2003, at Metro; Scott Carroll, *A Stormy End to Tallevast Talks*, SARASOTA HERALD-TRIB., Dec. 9, 2005, at B1; Scott Carroll, *Warrior Women with Community Support*, SARASOTA HERALD-TRIB., July 19, 2004, at A1; Editorial, *Coronet's Problems Were Kept Quiet for Far Too Long*, TAMPA TRIB., Aug. 1, 2003, at Nation/World 16.

39. FLA. DEP'T OF ENVTL. PROT., AUGUST 3RD WORKSHOP DRAFT: CONTAMINATED SITE CLEANUP CRITERIA CH. 62-780, F.A.C. 10 (2004), http://www.dep.state.fl.us/waste/quick_topics/publications/wc/Rule_Workshops/780TextFinalAugust2004Workshop.pdf.

40. *Id.* at 11.

41. FLA. ADMIN. CODE ANN. r. 62-780.220(2) (2005).

42. *Id.* Notice should include the location of the property, all record owners, parcel identification, current owner's contact information, table listing contaminants by their medium, and a vicinity map showing where samples had been taken in correspondence with the laboratory results. *Id.*

43. See Joe Follick, *'Tallevast' Bill Becomes Law*, SARASOTA HERALD-TRIB., May 25, 2005, at B; Jeremy Wallace, *'Tallevast' Bill Just the Beginning*, SARASOTA HERALD-TRIB., May 6, 2005, at B.

Governor Bush on May 24, 2004.⁴⁴ For the most part, this legislation codified the contamination notification requirements promulgated in chapter 62-780 of the Florida Administrative Code, by requiring those conducting site rehabilitation of contaminated property to notify potentially affected persons of the existence of contamination.⁴⁵ Specifically, the statute provides that if at any time during site rehabilitation, conducted pursuant to specific provisions of chapter 376, the person responsible for site rehabilitation or his or her agent or representative discovers from laboratory analytical results that contamination as defined in applicable FDEP rules exists in any medium beyond the boundary of the property at which site rehabilitation was initiated, the person responsible for site rehabilitation shall give actual notice no later than ten days from such discovery to the FDEP Division of Waste Management in Tallahassee.⁴⁶ A copy of the notice must also be simultaneously mailed to the applicable FDEP District Office, County Health Department, and all known lessees or tenants of the source property.⁴⁷

Within thirty days of receiving the actual notice (or if the FDEP already possessed information equivalent to that required by the notice, within thirty days of the effective date of the legislation), the FDEP must notify all owners of record of real property, except for owners of property where site rehabilitation was initiated, at which sites contamination was discovered.⁴⁸ This particular provision imposes a significant burden on FDEP and requires it to review all sites undergoing FDEP supervised site remediation and identify all instances of actual contamination beyond the source property boundaries.⁴⁹ As a direct consequence of this statutory requirement, in May 2005, FDEP began sending out notice letters to all persons affected under this statute (and Global RBCA) for sites undergoing state supervised remediation.⁵⁰ FDEP further identified those sites where off-site contamination was suspected, but not confirmed, and also provided notice to the property owners. Where there was off-site contamination, pursuant to this statute, FDEP was required to notify all owners of record where contamination had been discovered.⁵¹ The FDEP developed

44. Act effective Sept. 1, 2005, ch. 2005-50, 2005 Fla. Laws 937 (codified at FLA. STAT. § 376.30702 (2005)).

45. FLA. STAT. § 376.30702(2) (2007).

46. *Id.*

47. *Id.*

48. *Id.* § 376.30702(3).

49. *Id.*

50. See FLA. ADMIN. CODE ANN. r. 62-780.220(2) (2005).

51. See FLA. STAT. § 376.30702(2)(d) (2007).

template letters to inform the affected property owners whether pollutants were found in soil, groundwater, or both media at “properties in your area” or “at your property.”⁵² In addition, the letters identified the source property and included a table listing the specific pollutants found during the assessment of the source property.⁵³ Also included were statements regarding measures property owners could take to minimize their potential exposure to any such pollutants, such as, “[y]ou can reduce the risk of exposure to soil pollutants by thoroughly washing your hands after gardening . . .” and “[i]f [your well] has not been tested within the past three years, we recommend having the water sampled . . .”.⁵⁴

The Florida Legislature intended for the provisions of this legislation to increase awareness and knowledge of contaminated sites by requiring early notification of the discovery of contamination. While it is hard to develop an argument against the public policy interests being served in ensuring that innocent property owners are notified of contamination to their property caused by neighboring property, it is too early to evaluate the true impact of these notification requirements. However, the broad notification requirements contained in the legislation, the expansion of the notice to include suspected contamination, and the ambiguous notification letters being sent by FDEP may well result in an increase in litigation concerning contaminated properties and cause undue public alarm where risk to human health from such contamination is minimal or non-existent.

IV. STRICT LIABILITY AND ARAMARK

Sections 376.30 through 376.319 provide for the protection and preservation of lands, surface waters, and groundwaters of Florida, and confer upon the FDEP the broad power to deal with environmental and health hazards, as well as threats of danger and damage posed by the storage, transportation, and disposal of pollutants, drycleaning solvents, and hazardous substances.⁵⁵ Generally, these statutes prohibit the discharge of pollutants or hazardous waste substances into or upon the surface or ground waters of the state or lands and establish both civil and criminal penalties for the violation of these statutes.⁵⁶ By way of a civil enforcement

52. See e.g., Fla. Dep’t of Env’tl. Prot., Public Notification of Offsite Contamination, <http://www.dep.state.fl.us/waste/misc/notification/default.htm#map> (last visited Nov. 14, 2007).

53. See *id.*

54. See *id.*

55. FLA. STAT. §§ 376.30-376.319 (2007).

56. See *id.* § 376.302.

mechanism, FDEP is authorized to file a civil suit against any person who causes a discharge of pollutants, or hazardous substances, or who owns or operates a facility at which a discharge occurs.⁵⁷ This statutory provision also enumerates the limited defenses that may be raised in such an action.⁵⁸ A similar cause of action is provided for individuals who have suffered damages resulting from a discharge or condition of pollution covered by these statutes.⁵⁹ Specifically, section 376.313(3) provides:

Except as provided in s. 376.3078(3) and (11), nothing contained in ss. 376.30-376.319 prohibits any person from bringing a cause of action in a court of competent jurisdiction for all damages resulting from a discharge or other condition of pollution covered by ss. 376.30-376.319. . . . [I]n any such suit, it is not necessary . . . to plead or prove negligence in any form or manner. [A] person need only plead and prove the fact of the prohibited discharge or other pollutive condition and that it has occurred. The only defenses to such cause of action shall be those specified in s. 376.308.⁶⁰

Since its enactment, practitioners and courts in Florida have wrestled with whether the legislature intended to create a strict liability cause of action. First, in *Cunningham v. Anchor Hocking Corp.*,⁶¹ Cunningham and several other individuals, who were all workers in Anchor Hocking's glass manufacturing plant, sued Anchor Hocking, alleging that "they were exposed to toxic substances resulting in respiratory problems, liver damage, brain tumors, pulmonary disease, cancer, and other disorders."⁶² The First District held that the trial court erred in dismissing claims that were based on a statutory strict liability theory under section 376.313, suggesting that section 376.313 creates a private cause of action for persons injured by a defendant's release of hazardous materials that cause environmental as well as health hazards, regardless of whether the damages are associated with the pollution of land or water.⁶³

57. *Id.* § 376.308(1)(a).

58. *Id.* § 376.308.

59. *See id.* § 376.313.

60. *Id.* § 376.313(3).

61. 558 So. 2d 93 (Fla. 1st DCA 1990).

62. *Id.* at 94.

63. *See id.* at 99; *see also* Gary K. Hunter, Jr., *Statutory Strict Liability for Environmental Contamination: A Private Cause of Action to Remedy Pollution or Mere Legislative*

Second, in 1993, in *Mostoufi v. Presto Food Stores, Inc.*,⁶⁴ Mostoufi, the owner of a gasoline station, sued Presto, the previous owner, seeking compensation for damages from petroleum contamination of Mostoufi's property which Presto allegedly caused during the time that Presto owned the property.⁶⁵ Mostoufi brought a strict liability claim under section 376.313(3) to recover the reduction in value of the property caused by the contamination.⁶⁶ In affirming the trial court's dismissal of the claim, the Second District found that section 376.313(3) did not create a new cause of action.⁶⁷ The Court pointed to the introductory sentence in section 376.313 and concluded that the statute is framed so as not to prohibit bringing a cause and should not be interpreted as creating a new cause of action.⁶⁸ In dicta, the Court stated that to interpret section 376.313(3) otherwise would negatively impact the purpose of sections 376.30 to 376.319, which "is to protect the lands and waters of Florida and to provide for the prompt containment and removal of damage to those lands and waters by pollutant discharge."⁶⁹

In *Kaplan v. Peterson*,⁷⁰ Kaplan, the current owner of commercial real property, sued Peterson, the prior owner, seeking compensation for damages from petroleum contamination of Kaplan's property which Peterson allegedly caused during the time Peterson owned the property.⁷¹ Kaplan sought damages for the expenses and costs associated with remediation of the property based on a strict liability claim under chapter 376.⁷² The Fifth District found that section 376.313(3) contemplated and permitted such a private cause of action and recognized that, although "[c]ourts are reluctant to read into a statute a new . . . cause of action," section 376.313 makes "little sense if it does not do so."⁷³

To resolve the conflict between the district courts of appeal, the Florida Supreme Court accepted jurisdiction in *Aramark*, and held that the statute creates a strict liability cause of action.⁷⁴ In *Aramark*, the Florida Supreme Court approved the First District's

Jargon?, 72 FLA. B.J. 50 (1998).

64. 618 So. 2d 1372 (Fla. 2d DCA 1993); *see also* Morgan v. W.R. Grace & Co.-Conn., 779 So. 2d 503, 505-07 (Fla. 2d DCA 2000).

65. 618 So. 2d at 1373.

66. *Id.*

67. *Id.* at 1376-77.

68. *Id.* at 1376.

69. *Id.* at 1377.

70. 674 So. 2d 201 (Fla. 5th DCA 1996).

71. *Id.* at 202.

72. *Id.*

73. *Id.* at 203.

74. *Aramark Unif. & Career Apparel, Inc. v. Easton*, 894 So. 2d 20, 28 (Fla. 2004).

opinion and disapproved *Mostoufi* to the extent that it was inconsistent with the holding in *Aramark*.⁷⁵ Specifically, the Supreme Court held that section 376.313(3) creates a private cause of action imposing strict liability for damages against an adjoining landowner without proof that the defendant actually caused the pollution.⁷⁶ In addition, the Court held that the defendant is limited to the statutory defenses found in section 376.308.⁷⁷

Aramark acquired a property upon which a dry cleaning business was operated and which had been determined to be contaminated.⁷⁸ Aramark began assessment and remediation of the property pursuant to a consent order with the FDEP that, among other things, required Aramark to remediate any contamination in the groundwater under the neighboring property owned by Easton.⁷⁹ Easton subsequently learned that chemical solvents from Aramark's property had contaminated Easton's soil and groundwater.⁸⁰ Easton sought monetary damages and injunctive relief from Aramark for the prior and ongoing migration of contamination onto and under his property, asserting various common law theories as well as a claim under section 376.313(3).⁸¹ The trial court concluded that although "contamination of Easton's property had diminished its value by \$153,000," Easton failed to prove that Aramark or the prior owners of the property had caused the contamination.⁸² Thus, the trial court entered judgment in Aramark's favor.⁸³ The First District reversed, holding that section 376.313(3) creates a private cause of action for strict liability and does not require proof that the defendant caused the contamination.⁸⁴ The Florida Supreme Court agreed that section 376.313(3) creates a private cause of action because the precise cause of action that the statute authorizes provides a remedy unavailable under the common law.⁸⁵ Under the common law, a landowner whose land is damaged by pollution from an adjoining landowner can assert various claims, but all available common law claims require proof that the defendant caused the pollution resulting in the damages.⁸⁶ On its face, however, section 376.313(3), "departs from

75. *Id.*

76. *Id.*

77. *Id.*

78. *Id.* at 21.

79. *Id.*

80. *Id.* at 21-22.

81. *Id.* at 22.

82. *Id.*

83. *Id.*

84. *Easton v. Aramark Unif. & Career*, 825 So. 2d 996, 999 (Fla. 1st DCA 2002).

85. 894 So. 2d at 24.

86. *Id.* at 23-24.

the common law by creating a damages remedy for the non-negligent discharge of pollution without proof that the defendant caused [the discharge].”⁸⁷

The Court found further evidence that section 376.313(3) creates a private cause of action in the limited defenses that the statute allows (for example, the innocent purchaser defense, an act of God, an act of war, and the third party defense).⁸⁸ The Court stated that “[s]uch defenses would be superfluous if a plaintiff had to prove, as part of the . . . action, that the defendant caused the contamination.”⁸⁹ After all, “[s]uch person need only plead and prove the fact of the prohibited discharge or other pollutive condition and that it has occurred. The only defenses to such cause of action shall be those specified in s. 376.308.”⁹⁰

In addition, the Court found that other parts of section 376.313(3), including its title (“Nonexclusiveness of remedies and individual cause of action for damages under ss. 376.30-376.319”), “evidence[d] the legislature’s intent to create a cause of action rather than modify existing ones.”⁹¹ The Court also pointed to a cumulative remedies clause and an attorney’s fees provision in the statute, both evidencing that the statute creates a new cause of action in addition to those available under the common law.⁹²

Finally, the Court noted several public policy reasons for interpreting section 376.313(3) to create a private cause of action. It reasoned that “between the owner of contaminated property and a victim of pollution, the current owner is in a superior position to protect itself through pre-purchase due diligence and negotiation of indemnities with the seller.”⁹³ The Court also noted that “[p]rospective purchasers of contaminated property also have recourse to an entire industry providing pre-acquisition environmental audits and environmental insurance products that protect against third party damage claims.”⁹⁴ Thus, the Court remanded the case to the circuit court “to apply section 376.313(3) as a strict liability statute, without requiring proof that the petitioners caused the contamination on their own property, and to determine whether any of the statutory exceptions and defenses apply.”⁹⁵

In the wake of *Aramark*, environmental risks for which land-

87. *Id.* at 24.

88. *Id.*

89. *Id.* at 25.

90. FLA. STAT. § 376.313(3) (2006).

91. 894 So. 2d at 25.

92. *Id.* at 25-26.

93. *Id.* at 25.

94. *Id.*

95. *Id.* at 28.

owners may be held strictly liable in Florida are potentially greater than ever.⁹⁶ Because those risks are no longer covered under the CGL policy following *Dimmitt*, more and more purchasers of property and owners of contaminated property are well advised to avail themselves of one of the many types of specialized environmental insurance policies now available. Yet, underpinning these growing concerns is the responsibility of purchasers to conduct thorough due diligence. Without this integral step, the existence of environmental liability insurance will only yield futility and frustration.

V. IMPORTANCE OF CONDUCTING ALL APPROPRIATE INQUIRIES

Environmental due diligence is arguably the most effectuating step in the decision to purchase or sell real property. Contamination of real property can result in thousands of dollars in damage and even more to remediate. From a public policy perspective, conducting due diligence benefits both the seller and buyer of a real estate transaction. The buyer may avoid possible remediation costs and consequently any future litigation costs in attempts to attach liability to the seller. The seller, assuming he or she conducted due diligence prior to purchasing, may avoid liability for prior injuries to the real property. Ultimately, performing due diligence puts all parties on a level playing field and securing environmental liability insurance may be seen as the last necessary step in making sure each party is afforded the proper protection.

The EPA's adoption of the AAI rule in November 2006 has placed the need for environmental liability insurance at the forefront of the real estate process. With respect to commercial property, sellers and buyers must comply with this rule or risk losing any defenses available to them.⁹⁷ These defenses, apart from the standard act of God and act of war defenses, include the innocent landowner, the bona fide prospective purchaser, and the contiguous property owner defense.⁹⁸ To avail oneself of these defenses, one must demonstrate that he or she did not know, or have reason to know, of the presence of hazardous substances, requiring one to conduct "all appropriate inquiries" into prior ownership and uses.⁹⁹

96. See, e.g., *Brottem v. Crescent Res. LLC*, 19 Fla. L. Weekly Fed. D786 (M.D. Fla. 2006) (noting that a Florida court could find a private cause of action for personal injury damages suffered by employees of previous owners suing a new "innocent" owner).

97. For discussion of defenses and AAI requirements, see Ralph A. DeMeo & Lynn S. Scruggs, *All Appropriate Inquiries in Commercial Real Estate Due Diligence: What Inquiring Minds Need to Know*, 81 FLA. B.J. 24 (2007).

98. 42 U.S.C. § 9607(q), (r) (2000); see also 42 U.S.C. § 9601(35)(B) (2000).

99. Standards and Practices for All Appropriate Inquiries, 70 Fed. Reg. 66070, 66,072

Under the AAI rule, purchasers are required to conduct a thorough investigation into the prior uses and ownership of the subject property, including interviews of past and present owners, on-site visual inspections, and reviews of historical and governmental records.¹⁰⁰

Increasing demands of environmental due diligence, together with *Aramark*, puts prospective purchasers and owners at risk for a strict liability action. These risks are what make environmental liability coverage so important in the equation of real estate transactions.

VI. TYPES OF COVERAGE AVAILABLE

A key element of an insurance policy is what is known as a coverage trigger. The coverage trigger determines which incidents, temporally speaking, an insured can claim under the policy. Under a claims-made policy, the trigger for coverage is the claim being made to the insurer. As long as the release that causes injury occurs on or after the retroactive date, if any, and a claim is made during either the policy period in which the claim arose or during any automatic or optional extended reporting periods, it will be covered.¹⁰¹ If the policy does not provide a retroactive date, then it provides unlimited prior acts coverage and the only requirement is that the claim be made during the policy period in which the claim arose.¹⁰² With claims-made insurance, the insured must maintain an environmental insurance policy, either by renewing annually or by purchasing a multi-year policy, in order to be covered against environmental liabilities.¹⁰³

With occurrence based policies, on the other hand, the trigger for coverage is the occurrence of the pollution event. As long as an occurrence based insurance policy was in place at the time the pollution event took place, any claims arising out of that event will be covered under the policy.¹⁰⁴ The downside to this type of policy is that it requires knowledge of when the pollution event occurred, which is particularly difficult in instances of gradual pollution.¹⁰⁵ In these cases it is possible for a dispute to arise concerning which

(Nov. 1, 2005) (to be codified at 40 C.F.R. pt. 312).

100. 70 Fed. Reg. at 66,074.

101. Ann M. Waeger, *Current Insurance Policies for Insuring Against Environmental Risks*, SK029 A.L.L.-A.B.A. 709, 717 (2004).

102. DAVID J. DYBDAHL, A USER'S GUIDE TO ENVIRONMENTAL INSURANCE 29, <http://erraonline.org/usersguide.pdf> (last visited Nov. 22, 2007).

103. Waeger, *supra* note 101, at 717.

104. DYBDAHL, *supra* note 102, at 35.

105. *Id.*

policy covers the losses, especially if the insured switched insurers around the disputed time.¹⁰⁶

All of the insurance policy types discussed below are of the claims-made variety, except for contractor's pollution liability coverage, which is offered on either a claims-made or occurrence basis.

A. Pollution Legal Liability

Pollution legal liability (PLL) is the quintessential form of environmental insurance, specifically developed to address and fill the gap left by the absolute pollution exclusion in the CGL policy.¹⁰⁷ PLL is the generic designation for this type of policy,¹⁰⁸ but other names such as Pollution Legal Liability Select, Environmental Impairment Liability, and Pollution and Remediation Legal Liability are used interchangeably, depending on the insurer.¹⁰⁹ The standard PLL policy type covers third-party liability for new or existing pollution events on, at, under, or arising from locations specifically covered in the policy,¹¹⁰ and also pays first-party remediation costs resulting from unknown pre-existing or new pollution incidents at the covered location as well as bodily injury and property damage.¹¹¹

PLL policies are of the claims-made insurance type; but, policies offer a sixty-day free extended reporting period and the option for the insured to purchase an additional reporting period, ranging from one to four years, upon the termination of the policy. These policies generally offer menu-style coverage, where a business can peruse a list of available coverages and select the ones that best fit its needs.¹¹² Also available under these policies is coverage for business interruption caused by a release of pollutants, clean up costs associated with pollution conditions arising from pollution releases from transported cargo, and liability for costs associated with the clean up of non-owned disposal sites.¹¹³ Legal defense

106. *See id.*

107. *Id.* at 27.

108. Another common generic name for this type of policy is environmental impairment liability ("EIL") insurance. *Id.*

109. The authors acknowledge the assistance of Michelle Clark, Underwriter for AIG Environmental, in Atlanta, GA for her contributions.

110. Zurich North America, Environmental Impairment Liability (2003), <http://www.zurichna.com/zus/zsource.nsf/AttachByIDType/310Marketing%20Material?open&id=310> (follow "Env Impairment Liability" PDF file link).

111. *See, e.g.,* AIG Environmental, Pollution Legal Liability Select (2007), <http://www.aigenvironmental.com/environmental/public/envproducts/0,1338,65-13-4162,00.html> (last visited Nov. 14, 2007) [hereinafter AIG Environmental].

112. Waeger, *supra* note 101, at 720.

113. *Id.*

expenses are also generally covered, but the cost of such defense is deducted from the policy limit and ceases when that amount is exhausted.¹¹⁴ Typical PLL terms include a minimum premium of between \$5,000 to \$15,000 per year, a minimum deductible between \$5,000 to \$10,000 per incident, with policy limits from \$1,000,000 to \$100,000,000, although higher limits can be negotiated.¹¹⁵

In addition to the generic PLL policy, insurers have developed specialized PLL policies to meet the needs and risks of certain industries.

1. Commercial Pollution Legal Liability

The Commercial pollution legal liability policy was specifically developed for first-time buyers of environmental insurance.¹¹⁶ It is modeled after the standard CGL policy, which is written in a more familiar form than the menu-style of the PLL policy and offers coverage for a broad range of environmental risks.¹¹⁷ This policy is marketed towards industries that range from manufacturing and chemical, to education and medical.¹¹⁸ The key difference between commercial PLL and standard PLL is that the former offers blanket coverage for environmental liabilities including those associated with owned/operated properties, disposal sites, contracting operations, and transportation exposures, without the need to schedule each individual site or operation.¹¹⁹ In contrast, the standard PLL policy only offers site specific coverage. The commercial PLL policy addresses disposal site liability by setting a retroactive date in the policy and covering all liabilities arising from disposal activity after that date. Typical terms include a minimum premium of \$10,000 per year, a minimum deductible of \$10,000 per incident, and policy limits ranging from \$1,000,000 to \$100,000,000.

2. Real Estate Pollution Legal Liability

Real estate pollution legal liability is an insurance product

114. See, e.g., AIG Environmental, Pollution Legal Liability Commercial, <http://www.aigenvironmental.com/environmental/public/envhome> (follow "Pollution Products" hyperlink under "Our Product Categories"; then follow "Pollution Legal Liability Commercial" link) (last visited Nov. 14, 2007).

115. *Id.*

116. *Id.*

117. Waeger, *supra* note 101, at 720.

118. AIG Environmental, *supra* note 111.

119. *Id.*

marketed to real estate investors. It is also offered under the names Pollution Legal Liability Real Estate and Real Estate Environmental Liability. The purpose of this policy type is to protect buyers and sellers of real estate who are involved in mergers, acquisitions, or divestitures from first-party cleanup costs at an insured property and third-party claims resulting from pollution conditions that cause on- or off-site bodily injury, property damage, or require cleanup.¹²⁰ In addition to offering protection against historical contamination or future pollution events, a real estate PLL policy can reduce or eliminate collateral requirements to support environmental provisions contained in the underlying sales agreement.¹²¹ It can also serve to meet due diligence requirements in a more efficient manner, by eliminating the need for a Phase I audit in some cases.¹²² Also, depending on the policy, new sites can either be added easily or automatically added to the policy as the policy-holder's portfolio changes.¹²³ As an additional feature of interest to real estate investors, some insurers advertise that "[c]onsent to policy assignment requests will not be unreasonably withheld."¹²⁴ For coverage to exist, a pollution condition must be discovered and reported within the policy period. Discovery of such pollution conditions happens when any officer or any employee with management responsibility of the insured becomes aware of such pollution conditions.¹²⁵ Typical terms include a minimum premium of \$10,000 per year, a minimum deductible of \$25,000 per incident, and policy limits ranging from \$1,000,000 to \$100,000,000.

3. Contractor's Pollution Liability and Environmental Professional Errors and Omissions Insurance

Contractor's PLL insurance is marketed to those who perform environmental remediation services on contaminated sites.¹²⁶ It is also offered under the names Professional Consultants Liability, Contractors Pollution Liability and Occurrence, and General Con-

120. See, e.g., AIG ENVTL., POLLUTION LEGAL LIABILITY COMMERCIAL REAL ESTATE POLICY SPECIMEN (1999), <http://www.aigenvironmental.com/environmental/public/envfiledownload/0,1337,1088,00.pdf>.

121. CHUBB ENVTL. SOLUTIONS, ENVIRONMENTAL SITE LIABILITY INSURANCE FOR BUYERS AND SELLERS OF PROPERTY (2005), <http://www.chubb.com/businesses/cci/chubb3487.pdf>.

122. Waeger, *supra* note 101, at 721.

123. See, e.g., Zurich North America, Environmental - Real Estate Environmental Liability, <http://www.zurichna.com/zus/zsource.nsf/display?openform&id=309> (last visited Oct. 14, 2007).

124. *Id.*

125. AIG Environmental, *supra* note 111.

126. DYBDAHL, *supra* note 102, at 34.

tractor's Pollution Legal Liability.

Contractor's PLL policies differ significantly from standard PLL policies and are aimed at the specific risks faced by contractors. First, where standard PLL policies are site-specific in the sense that they are written for a designated premises, contractor's PLL policies cover both a contractor's operations and activities at a project site and the contractor's completed operations and contractual liability exposures.¹²⁷ Thus, the policy covers the contractor's *operations* at a project site rather than the site itself.¹²⁸ These policies are available either on a blanket basis for all of the contractor's operations or on a project specific basis. A second key difference is that contractor's PLL policies are offered on both a claims-made and occurrence basis.¹²⁹ Additionally, contractor's PLL policies typically contain a retroactive date, meaning that prior acts coverage is not included unless it is negotiated.¹³⁰ The contractor's PLL policy also omits exclusions found in the standard PLL policy so that the contractor's PLL policy will cover completed operations, damage to the insured site, and "the cost of remediating the job site for a loss created by the contractor's operations."¹³¹ Other exclusions not found in the contractor's PLL policy are asbestos, lead, underground storage tanks, and non-nuclear radioactive matter.¹³² Finally, these policies offer vicarious coverage for subcontractor's operations.¹³³

Most insurers also offer a combination policy that provides both contractor's PLL coverage and errors and omissions (E&O) coverage. E&O insurance provides coverage for acts, errors and omissions arising from services performed on behalf of the insured. In its pure form, it is marketed toward environmental professionals, such as environmental engineers, testing labs, and consultants, who are subject to many of the same liabilities under CERCLA as are site owners.¹³⁴ The combination policy offers coverage for full-service environmental firms who perform both field operations and professional services.¹³⁵ Typical terms include a minimum pre-

127. *Id.*

128. *Id.*

129. *Id.* at 35.

130. *Id.* at 34.

131. *Id.* at 35.

132. Zurich North America, Environmental - Contractor's Pollution Liability, <http://www.zurichna.com/zus/zsource.nsf/display?openform&id=384> (last visited Oct. 14, 2007).

133. DYBDAHL, *supra* note 102, at 34.

134. For example, pursuant to 42 U.S.C. § 9607(a)(3), such individuals may be subject to liability as an arranger for the disposal of treatment of hazardous substances.

135. AIG Environmental, Contractor Operations and Professional Services (COPS), <http://www.aigenvironmental.com/environmental/public/envproducts/0,1338,65-13-4230,00.html> (last visited Nov. 14, 2007).

mium that can range from as low as \$5,000 per year for basic liability coverage to a minimum of \$22,500 per year for combined liability and E&O coverage (premiums are slightly higher for occurrence based policies). Minimum deductibles varies greatly depending on the coverage but can be as low as \$10,000 per incident on a basic liability policy, with policy limits ranging from \$1,000,000 to \$100,000,000 (per loss and aggregate).¹³⁶

4. Lender Liability Insurance

Lender liability insurance is also available. Specific products offered are Lender Environmental Protection, Securitization Collateral Protection, Environmental Liability Insurance, and Real Estate Lender's Policy.¹³⁷ These lender liability policies are designed for financial institutions that hold or invest in loans backed by commercial real estate.¹³⁸ They provide coverage in the event of a default on the loan for cleanup costs resulting from pollution events occurring or discovered during the policy period. The policy trigger for these types of loans is "a mortgage loan default and the filing of a claim against the [policyholder] for pollution conditions or simple discovery of pollution conditions."¹³⁹ These policies generally offer the option of coverage for the unpaid loan amount, remediation costs, and third-party liability claims arising from pollution events on the property.¹⁴⁰ Each insurer puts a different twist on their coverage. For instance, one offers a "lesser of" policy that pays the lesser of the outstanding loan balance or the estimated cleanup costs.¹⁴¹ However, if the estimated cleanup costs exceed fifty percent of the outstanding loan balance, the insured can choose a claim payment covering either the unpaid loan amount or the estimated cleanup costs.¹⁴² This policy can be used in place of a Phase I or other environmental audit, usually for less than the cost of an audit. Also, borrowers are not insured under

136. See, e.g., AIG ENVTL., CONTRACTOR'S OPERATIONS AND PROFESSIONAL SERVICES ENVIRONMENTAL INSURANCE POLICY SPECIMEN (2000), <http://www.aigenvironmental.com/environmental/public/envfiledownload/0,1337,1197,00.pdf>.

137. AIG, a major insurer, recently stopped offering its Secured Creditor Impaired Property Insurance due to large claims made under the policy. See Waeger, *supra* note 101, at 724.

138. See, e.g., Zurich North America, Environmental - Lender Environmental Protection, <http://www.zurichna.com/zus/zsource.nsf/display?openform&id=604&changemenu=No>. (last visited Nov. 14, 2007) [hereinafter Zurich North America].

139. XL Environmental, Coverage Details for Real Estate Lender's Policy, <http://www.ecsinc.com/asp/frame.asp?strID=RELP> (last visited Nov. 14, 2007).

140. *Id.*

141. Zurich North America, *supra* note 139.

142. *Id.*

the lender liability policy so they will need to purchase their own policy. Typical policy terms include a “target premium” of \$20,000, though lower premiums are negotiable, a minimum deductible as low as \$0, with policy limits from \$1,000,000 to \$100,000,000 per incident.¹⁴³

5. Other Specialized Liability Policies

In addition to the common variations on the standard PLL policy listed above, insurers have also developed a number of different policies tailored for specific industries. A partial list includes: Pollution Liability for Healthcare Industry, Automobile Dealer and Repair Pollution Liability, Professional Consultants Liability, Professional Environmental Consultants Liability, and Dry Cleaners Pollution Liability¹⁴⁴

Another significant type of specialty liability policy is Commercial Storage Tank PLL insurance.¹⁴⁵ This type of policy is necessary since most PLL policies contain a known underground storage tank exclusion. It is marketed to owners of scheduled storage tank systems, and the purchase of a policy can be used to meet state and federal financial responsibility requirements for storage tank owners and operators.¹⁴⁶ Premiums for this type of policy can be quite affordable (as low as \$500) and premium discounts are offered to users of state of the art storage tank technology.¹⁴⁷

Both the Florida petroleum and dry cleaning programs require a facility owner to maintain some form of financial responsibility for potential property damage or injury to third parties. In addition, as a condition of operating underground storage tanks (USTs) or aboveground storage tanks (ASTs) that contain petroleum or petroleum derived products, a facility owner must maintain financial responsibility for corrective action resulting from the discharge or release from such tanks. The owner or operator of a UST that handles on average more than 10,000 gallons of petroleum per month must demonstrate financial responsibility in the amount of \$1,000,000 for taking corrective action and for compensating third parties for bodily injury and property damage.¹⁴⁸ There are sev-

143. See, e.g., GREENWICH INS. CO., POLLUTION AND REMEDIATION LEGAL LIABILITY REAL ESTATE LENDER'S POLICY (2003), <http://www.ecsinc.com/forms/pdf/GIC-RELP4CP.pdf>.

144. See Zurich North America, *supra* note 139; AIG Env't'l, *supra* note 137.

145. See AIG Environmental, Storage Tank Liability Insurance (TankGuard), <http://www.aigenvironmental.com/environmental/public/envproducts/0,1338,65-13-4199,00.html> (last visited Nov. 14, 2007).

146. *Id.*

147. *Id.*

148. 40 C.F.R. § 280.93(a) (2005); see also FLA. STAT. § 376.309(1) (2005); FLA. ADMIN.

eral methods of providing proof of financial assurance.¹⁴⁹ The most common method, however, is by way of insurance.¹⁵⁰ Under the dry cleaning program, a dry cleaning facility owner or operator must maintain third-party liability insurance for \$1,000,000 of coverage for each operating facility.¹⁵¹ Third-party liability is defined as “the insured’s liability . . . for bodily injury caused by an incident of contamination related to the operation of a drycleaning facility.”¹⁵²

B. Cleanup Cost Cap

Every major insurer offers a cleanup cost cap (CCC) policy, the second main type of environmental insurance. Other names for this policy type include cost containment and remediation stop loss. A CCC policy protects against cost overruns when cleanup expenses exceed projected costs.¹⁵³ In other words, it caps the cost of a remediation project by insuring the policy holder for any amounts that exceed the projected cost (minus the deductible and buffer layer). In order to obtain a CCC policy, a potential insured must have a government or insurance company approved remediation plan in place and a cleanup estimate/scope of work from a reputable contractor.¹⁵⁴ Coverage, however, attaches above the expected cost of cleanup as determined by the insurer following a detailed internal engineering review of the contractor’s estimate/scope of work. Also, under these policies, payment occurs only when the cost overruns are caused by specific triggers: discovery of actual contamination greater than expected, discovery of unknown pollution during the course of the covered remediation plan, off-site contamination from pollutants considered in the remedial plan that are emanating from the covered site, or changes made by the regulatory authority to the scope of the remediation project or to the cleanup standard.¹⁵⁵ Such additional or unknown pollution must be linked to the pollution conditions which are the subject of the remediation plan for coverage to exist since CCC policies do not cover unrelated or newly discovered pollution conditions.¹⁵⁶

CODE ANN. r. 62-761.400(3)(a)(2) (2005).

149. See 40 C.F.R. §§ 280.94-.107 (2005).

150. See *id.* § 280.97.

151. FLA. STAT. § 376.3078(10) (2005).

152. *Id.* § 376.3079(3)(a).

153. Waeger, *supra* note 101, at 722.

154. *Id.*

155. See *id.*

156. See *id.*

While CCC policies do not offer third-party liability coverage, most, if not all, insurers offer a combination cleanup cost cap and PLL policy. They also have relatively few exclusions compared to liability policies because CCC policies are written on a first-party coverage basis; however, losses due to intentional acts or misrepresentations, bodily injury, contractual liability, fines or penalties, and war are generally excluded.¹⁵⁷ Typical terms include a minimum premium in the amount of eight to fifteen percent of estimated cleanup costs, a self-insured retention (SIR) equal to the estimated cost of the cleanup, plus ten to thirty percent to eliminate any incentive for underbidding and to account for losses almost certain to occur, and policy limits up to \$300,000,000 subject to reinsurance availability, but generally limits are twice the cost of cleanup.¹⁵⁸ Insurers will generally not cover cleanups costing under \$1,000,000.¹⁵⁹

Cleanup cost cap policies are being used increasingly to facilitate contaminated property transactions. In a transaction concerning contaminated property, it is typical for sellers to favor low estimates for the cleanup costs and buyers to favor high estimates, because these costs are integrated into the sale price and sellers are very wary of taking on a cleanup where the cost is uncertain.¹⁶⁰ A CCC policy helps to satisfy the buyer that costs will not exceed a certain amount, and the cost of purchasing the policy can be integrated into the deal, thus bringing certainty and moving the deal forward. Additionally, CCC policies are used by remediation contractors hired to perform remedial activities at a site. By purchasing a CCC policy, the contractor is able to give the property owner a fixed price contract with minimal risk. In such cases, however, an insurer will require the contractor to co-insure the excess to ensure that the contractor maintains an interest in the cleanup being completed within the contract price.

C. "Legacy" Insurance

In addition to the above policies of insurance written specifically to address the current needs of property owners with an interest in contaminated properties, it may also be possible to identify older "legacy" policies of insurance, which, in many cases, are long forgotten. So-called "insurance archeologists" discover

157. DYBDAHL, *supra* note 102, at 42.

158. Waeger, *supra* note 101, at 723.

159. *Id.*; see also GREENWICH INS. CO., REMEDIATION STOP LOSS POLICY SPECIMEN (2003), <http://www.ecsinc.com/forms/pdf/GIC-RSLCP.pdf>.

160. DYBDAHL, *supra* note 102, at 41.

through archival research the existence of policies of insurance, typically CGL policies written prior to the inclusion of the pollution exclusion. In many cases, these policies were written decades ago yet they still provide liability coverage to the insured. Even though there may be coverage defenses available to the insurer to avoid coverage, in many cases, insureds have been able to recover significant amounts of unanticipated money, often considered a windfall to the insured. Furthermore, recovery on these old legacy policies can be used as a vehicle to fund the purchase of the environmental insurance products dismissed above. Working on an hourly or contingent fee basis, companies and law firms have arisen that will research and identify these legacy policies and pursue claims against the insurer. For sites that have been around for many, many years, property owners, and others interested in acquiring contaminated properties, should investigate the existence of these older policies.¹⁶¹

VII. CONCLUSION

As a result of the notice provisions contained in Global RBCA and section 376.30702, and the broad retrospective notification requirements implemented by FDEP, it is expected that there will be an increase in third-party lawsuits brought against owners of contaminated property. Furthermore, as a result of the Florida Supreme Court's ruling in *Aramark*, the owners of property contaminated by neighboring operations may now march into the courtroom armed with a statutory cause of action providing for strict liability and the recovery of costs and attorney's fees. In addition, the EPA's adoption of the new AAI rule adds yet another consideration, requiring adherence to its complexities in order to be afforded any defense to liability.

Out of the CGL pollution exclusion, and subsequent litigation, a whole insurance industry has emerged providing coverage for specific environmental concerns. As third-party lawsuits increase and state and federal environmental agencies step up enforcement actions against industry and business for environmental harms, more and more people will likely turn to insurance policies to protect them from such environmental unknowns. It is clear from the Florida Supreme Court's ruling in *Aramark* that, from a public policy standpoint, a court will grant a prospective purchaser little relief, and thus, such purchasers should avail themselves of "an en-

161. The authors acknowledge the assistance of Laurence Eisenstein, with Eisenstein Malanchuk LLP, in Washington, D.C. for his contribution on legacy insurance.

tire industry providing pre-acquisition environmental audits and environmental insurance products” to protect themselves from third-party liability.¹⁶²

Environmental risk insurance is an effective way to manage risk and exposure to unforeseen liability. The insurance industry, however, is not a panacea, and many individuals who think that they are protected fall afoul of the numerous exclusions and requirements contained deep within the policies. An insured must remember that an insurance policy is a contract that contains certain conditions precedent which must be satisfied prior to coverage being provided. The courts, unwilling to alter the terms of such a contract, typically construe such exclusions and requirements strictly, rather than extend coverage for which the insurer has not bargained.¹⁶³ Recent terrorist attacks and natural disasters, and the growth of certain litigation areas, such as asbestos and mold litigation, have dramatically increased the number of claims being handled by the insurance industry. The insurance industry is responding by attempting to handle claims in a more “efficient” manner, thereby reducing its own risk. In addition, environmental coverage is typically available only through an insurance broker, who ideally assists purchasers with all the nuances of a policy. An owner of contaminated property or potential purchaser of property must, therefore, not only avail itself of appropriate environmental insurance, but must ensure that the policy is tailored to the particular concerns of the insured. Equally important, the insured must remain vigilant in complying with the requirements therein in order to minimize the insurer’s ability to deny a claim for coverage.

Owners of contaminated properties and those interested in acquiring contaminated properties should include a careful analysis of all available policies of insurance in their due diligence investigations. This investigation should include review of all existing and legacy insurance policies that may be in existence. If insurance of this nature does not exist, owners and prospective purchasers of contaminated properties should give serious consideration to obtaining one or more of the various coverages described above. The insurance industry is dynamic and individuals with an interest in contaminated properties must move fast to stay ahead of the game. While it is not feasible to protect oneself against any and all risks of environmental liability, the various policies of insurance described in this article do provide a mechanism for help-

162. *Aramark Unif. & Career Apparel, Inc. v. Easton*, 894 So. 2d 20, 25 (Fla. 2004).

163. *See, e.g., Gulf Ins. Co. v. Dolan, Fertig & Curtis*, 433 So. 2d 512 (Fla. 1983).

ing to manage and, in many cases, limit those risks. By taking advantage of the options available to them one can insure against environmental unknowns.

THE ECONOMICS OF ENFORCING ENVIRONMENTAL LAWS: A CASE FOR LIMITING THE USE OF CRIMINAL SANCTIONS

WESLEY D. SHERMAN*

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I. INTRODUCTION

*"[C]riminal enforcement of environmental laws is the most effective means to ensure compliance."*¹

It may be the case that there is no greater legal deterrent for environmental violations than the threat of criminal prosecution and incarceration; however, it does not necessarily follow that criminal enforcement of environmental laws leads to the most favorable outcome for society. Part of the problem with making such a determination is that there are so many interested parties, yet there is no agreement on how much weight should be given to the concerns of each party. Much of the early law-based literature took for granted that the paramount consideration in enforcing environmental regulations was to protect the environment by deterring all violations of environmental laws. In this Note, however, I attempt to balance the interests of firms affected by environmental regulations, consumers of those firms' products, individuals affected by violations of environmental regulations, and the agencies in charge of regulating polluters. I conclude that, in many instances, criminal enforcement of environmental laws is misguided. Instead, I suggest that civil and administrative penalties are preferable means of enforcing environmental violations.

I begin in Part II by explaining the theories used by lawyers and economists to support or oppose criminal enforcement of laws. In Part III, I address the major concerns of the interested parties in the context of environmental regulations so that the reader can consider the social implications of different enforcement schemes. Next, in Part IV, I discuss the various levels of culpability required by environmental statutes in order to impose criminal liability on the offender. In Part V, I explain the basics of benefit-cost analysis as applied by both polluters and enforcers. In addition, I weigh the potential benefits of, and problems with, efficient breaches of environmental regulations.

With all of this theoretical background in place, I continue in Part VI by analyzing U.S. Environmental Protection Agency (EPA) enforcement figures from 2000-2006,² drawing inferences about the EPA's difficult decision between criminal, civil, and administrative enforcement. In so doing, I find that the number of environmental crime investigations has declined since 2002, but that

1. Ethan H. Jessup, *Environmental Crimes and Corporate Liability: The Evolution of the Prosecution of "Green" Crimes by Corporate Entities*, 33 NEW ENG. L. REV. 721, 725 (1999).

2. See *infra* fig.1.

the percentage of investigations resulting in charges has actually increased since 2003.³ I also find that during the period in which criminal investigations decreased, civil judicial penalties were on the rise, suggesting that the EPA may, in fact, be pursuing civil and administrative penalties in many cases, leaving criminal prosecution for the more egregious violations.⁴ In Part VII, I discuss other, less conventional approaches to solving some of the problems addressed in the Note. Finally, I conclude by suggesting areas in which empirical studies could be conducted to aid officials in determining how best to enforce environmental laws.

II. CRIMINAL ENFORCEMENT OF ENVIRONMENTAL REGULATIONS

A. Legal Theories

In order to discuss the appropriate enforcement method for violations of environmental regulations, one must first understand the various enforcement mechanisms in general and the theories behind criminal law.⁵ Laws may be enforced through three bodies of law—criminal, civil/tort, and administrative—each with “its own definitions, standards of proof, procedures, and remedies.”⁶ Generally, criminal laws “require intent, are publicly enforced, and do not require that a victim be harmed”; tort laws, on the other hand, “do not require intent, are privately enforced, and require the plaintiff to establish damages.”⁷

A primary purpose of any criminal law is to deter people from committing crimes.⁸ Because of their power to take away the freedom of the actor, criminal sanctions provide a strong method of deterrence.⁹ Although civil actions can have serious effects, the consequences of a criminal investigation and prosecution are more severe, carrying the possibility of monetary penalties, jail time, and a “stigma of criminality.”¹⁰ This is particularly true for corporate officials, who tend to be especially concerned about their social status.¹¹ In addition, “environmental criminal defendant[s] [may]

3. See *infra* fig.2.

4. See *infra* fig.4.

5. Mark A. Cohen, *Environmental Crime and Punishment: Legal/Economic Theory and Empirical Evidence on Enforcement of Federal Environmental Statutes*, 82 J. CRIM. L. & CRIMINOLOGY 1054, 1057 (1992).

6. *Id.* at 1058.

7. *Id.*

8. Jessup, *supra* note 1, at 730.

9. *Id.*

10. Kevin A. Gaynor et al., *Environmental Criminal Prosecutions: Simple Fixes for a Flawed System*, 3 VILL. ENVTL. L.J. 1, 2 (1992).

11. Kathleen F. Brickey, *Environmental Crime at the Crossroads: The Intersection of*

incur several hundred thousand dollars in attorneys' fees if a case goes to trial."¹² Due to the strength of criminal charges, many regulators view criminal enforcement as the greatest deterrent to environmental violations.¹³

Criminal law is also employed to express "society's sense of moral outrage and condemnation" because it considers the actor's conduct culpable.¹⁴ As a result, society's beliefs are crucial to "determining whether an act is criminal and to what extent that act should be punished."¹⁵ Unfortunately, as public pressure to protect the environment increases,¹⁶ and because criminal prosecutions make "appealing headlines," agencies may seek criminal enforcement when administrative or civil actions are appropriate.¹⁷

Another goal of criminal law is remediation, which becomes an issue when an actor continues to violate an environmental regulation even after an enforcement agency becomes aware of the violation.¹⁸ Persistent violations can create a serious hazard to human health and the environment.¹⁹ Because of the efficiency of the criminal system compared to a civil or administrative action, criminal prosecution may be necessary where a violator does not change its activities once the violations are revealed.²⁰

B. Economic Theories

According to Judge Richard Posner, the distinction between criminal and tort law is not based on intent.²¹ Rather, he posits that the purpose of criminal law in a capitalist society is to prevent

Environmental and Criminal Law Theory, 71 TUL. L. REV. 487, 506 (1996); see also Sean J. Bellew & Daniel T. Surtz, Comment, *Criminal Enforcement of Environmental Laws: A Corporate Guide to Avoiding Liability*, 8 VILL. ENVTL. L.J. 205, 209-10 (1997) (noting that prosecution of white-collar crime may have a greater deterrent effect than prosecution of street crimes because of the "severe personal consequences" that result from criminal investigation and prosecution).

12. Gaynor et al., *supra* note 10, at 2.

13. *Id.* at 2-3.

14. Brickey, *supra* note 11, at 506.

15. Jessup, *supra* note 1, at 731.

16. See Eva M. Fromm, *Commanding Respect: Criminal Sanctions for Environmental Crimes*, 21 ST. MARY'S L.J. 821, 823 (1990); see also Bellew & Surtz, *supra* note 11, at 205 n.2.

17. Fromm, *supra* note 16, at 823.

18. See Jessup, *supra* note 1, at 731.

19. *Id.*

20. *Id.*

21. See Richard A. Posner, *An Economic Theory of the Criminal Law*, 85 COLUM. L. REV. 1193, 1194 (1985). Posner asserts that in criminal law, placing the emphasis "on punishing harmless preparatory activity, on the mental state of the accused, and, related to both points, on the moral character rather than the consequences of behavior, suggests a decidedly noneconomic perspective." *Id.* However, Posner disagrees with this distinction and believes both criminal law and common law can be given economic meaning. *Id.*

people from bypassing voluntary exchanges in the “market.”²² Since most of this market bypassing (for example, murders and rapes) cannot be deterred by tort law (because the amount of damages would far exceed the offender’s ability to pay), non-monetary sanctions such as imprisonment are required.²³ If a defendant can afford to pay the social costs of his actions, however, “there still is no social gain from using a criminal sanction.”²⁴

1. *Prices and Sanctions*

In determining how best to enforce a law or regulation, economists often distinguish between prices and sanctions. Professor Robert Cooter has defined a sanction as “a detriment imposed for doing what is forbidden, and a price as money extracted for doing what is permitted.”²⁵ If the forbidden behavior is sanctioned, then an actor’s behavior changes drastically when it moves “from the permitted zone into the forbidden zone.”²⁶ If the forbidden behavior is subject to a price instead of a sanction, however, the actor’s behavior becomes much “more elastic with respect to changes in” the price imposed.²⁷ As a result, Cooter explains, prices should be used “to compel decisionmakers to take into account the external costs of their acts,” whereas sanctions should be imposed “to deter people from doing what is wrong.”²⁸

The difference in behavior elasticity thus becomes important to lawmakers. If they are able to identify socially desirable behavior, but have difficulty accurately assessing the cost of deviations from that behavior, then sanctions should be preferred over prices.²⁹ If, on the other hand, “officials can accurately measure the external cost of behavior, but cannot accurately identify the socially desirable level of it, then prices are preferable to sanctions.”³⁰ For example, in the context of power plant emissions, officials are able to identify the socially desirable behavior—low emission levels—but have difficulty accurately assessing the costs of deviations from that behavior—detriment to air quality and human health from high emissions—so sanctions may be preferable to prices under Cooter’s model.

22. *Id.* at 1203.

23. *Id.*

24. *Id.* at 1204.

25. Robert Cooter, *Prices and Sanctions*, 84 COLUM. L. REV. 1523, 1523 (1984).

26. *Id.*

27. *Id.* at 1523-24.

28. *Id.* at 1523.

29. *Id.* at 1524.

30. *Id.*

2. Conditional Versus Unconditional Deterrence

The Learned Hand formula, which weighs the defendant's cost of avoiding an accident against the plaintiff's loss resulting from the accident, multiplied by the probability of the accident's occurrence, is applied by courts to cases involving unintentional torts.³¹ For criminal acts, however, the value to the defendant is irrelevant because society does not want actors to bypass the market and transfer goods through coercion.³²

Some crimes, on the other hand, result from activities that society does not want to eliminate entirely.³³ If the penalties for engaging in these activities are too severe, then there is a risk that people will engage in them less frequently than is socially desirable.³⁴ As a result, activities can be divided into those that we seek to deter "conditionally" and those we seek to deter "unconditionally."³⁵ A conditionally deterred activity is one in which society benefits from the underlying activity (such as breach of contract) that gives rise to the violation.³⁶ An unconditionally deterred activity (such as murder) is one in which the breaching party should be punished regardless of his or her benefit and the victim's costs.³⁷

Regulatory violations are typically conditionally deterred activities because "society benefits from the underlying activity."³⁸ Therefore, we do not want to increase the price of engaging in socially beneficial activities to a level that would deter firms from engaging in them.³⁹ This is especially true for regulatory violations such as oil spills that may not be entirely within the control of the firm or its employees.⁴⁰ If the costs incurred by oil companies as a result of the sanctions stemming from a spill made it too costly to conduct business, society would suffer from either increased oil prices or oil shortages.

Another issue that arises in the context of conditionally deterred activities is whether to base the enforcement method on the gain to the offender or on the harm to society.⁴¹ If the offender's punishment were based on his or her gain, then all conditionally

31. RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* 69 (2d prtg. 1974).

32. Posner, *supra* note 21, at 1195-98.

33. Cohen, *supra* note 5, at 1062.

34. *Id.*

35. *Id.*

36. See POSNER, *supra* note 31, at 357-58.

37. See *id.* at 358.

38. Cohen, *supra* note 5, at 1062.

39. *Id.*

40. *Id.*

41. *Id.* at 1062-63.

deterred activities would, in effect, become unconditionally deterred because there would be no opportunity for gain.⁴² Therefore, “the debate over whether to base sanctions on gain or on harm is essentially a debate over whether or not society wishes to ‘conditionally deter’ some crimes.”⁴³

3. *The “Optimal Penalty” Model*

In addition to overdetering socially beneficial activities, criminal enforcement of environmental regulations resulting in jail time may be very costly to society. Jail sentences result not only in resources being expended to build and operate prisons, but also in the lost productivity of the offender who is unable to work.⁴⁴ Although it may be difficult to accurately measure the overall gain that results from incarcerating an offender because of the hard-to-quantify indirect benefits (such as deterrence of potential violators and elimination of possible future infractions by the imprisoned offender), the indirect costs to society raised by the optimal penalty model should certainly be considered by lawmakers when determining the most effective regulatory regime for environmental violations.

III. CONCERNS OF THE INTERESTED PARTIES

One of the problems with determining the appropriate method of enforcing environmental regulations is accounting for the concerns of all of the interested parties. This Part examines those concerns, which should be kept in mind throughout this Note.

A primary concern of the offender is fairness.⁴⁵ “Perfect compliance with environmental laws is nearly, if not completely, impossible.”⁴⁶ As a result, a firm may be convicted for a relatively minor violation that it was unaware it had even committed.⁴⁷ Thus, it would be unfair to that firm for the Department of Justice (DOJ) to pursue aggressive criminal sanctions in order to set an example to the many offenders it has neither the time nor the re-

42. *Id.*

43. *Id.*

44. Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169, 179-80 (1968).

45. David C. Fortney, Note, *Thinking Outside the “Black Box”: Tailored Enforcement in Environmental Criminal Law*, 81 TEX. L. REV. 1609, 1615 (2003).

46. *Id.* See generally Richard J. Lazarus, *Meeting the Demands of Integration in the Evolution of Environmental Law: Reforming Environmental Criminal Law*, 83 GEO. L.J. 2407, 2428-40 (1995) (describing the complexity of environmental law).

47. See, e.g., Fortney, *supra* note 45, at 1615-16.

sources to go after.⁴⁸

In addition, firms must worry that criminal liability will be imposed on the entire organization for the uncontrollable acts of one employee.⁴⁹ While it is common to hold employers liable for the acts of their employees committed in the course of employment, vicarious liability “is a doctrine of civil, not criminal, liability.”⁵⁰ Criminal environmental jurisprudence has evolved, nevertheless, to transfer liability to firms and officers without the requisite mental state.⁵¹

The concerns of corporate officers, most notably the mental state required to impose individual criminal liability, must also be accounted for. Facing criminal sanctions merely because of one’s position within an organization is a difficult reality to face.⁵² Although some cases involve officers who participated in, or knew of, the violations, officers can be convicted under most environmental statutes even when this is not the case.⁵³ The idea that someone can be incarcerated “for an act [that he or she] neither committed nor knew about violates the most basic premise of American criminal law—that” sanctions be applied only to those with criminal minds.⁵⁴

The interests of the government are, of course, central to any enforcement scheme. The DOJ and regulatory agencies are forced to work with limited resources, which are spread over a wide range of enforcement activity.⁵⁵ Moreover, in response to public demand for results, the government may focus too much on “easy” cases (such as small business violations) and on corporate defendants with deep pockets.⁵⁶

There remain a number of crucial societal concerns to consider as well. First, the public has an interest in environmental enforcement programs that encourage prevention over punishment because the harm caused, even if compensable, is often permanent.⁵⁷ Next, society has an interest in punishment, as any regulatory scheme is unlikely to stop every offender.⁵⁸ As a result, it

48. *Id.* at 1616.

49. *Id.*

50. *Id.* at 1616-17 (citing W. PAGE KEETON ET AL., PROSSER & KEETON ON THE LAW OF TORTS § 2 (5th ed. 1984)).

51. See discussion *infra* Part IV.B.

52. Fortney, *supra* note 45, at 1617-18.

53. *Id.* at 1618.

54. *Id.* (citing WAYNE R. LAFAYE & AUSTIN W. SCOTT, CRIMINAL LAW §§ 1.2, 3.1 (2d ed. 1986)).

55. *Id.* at 1619.

56. *Id.*

57. *Id.* at 1619-20.

58. *Id.* at 1620.

may be unwise to abolish the ability to prosecute offenders criminally, especially in the case of repeat polluters who refuse to comply.⁵⁹ Finally, society has an interest in the efficient use of taxes.⁶⁰ While “[e]nvironmental protection is an admirable and necessary policy goal, [] it should not be achieved at the cost of bankrupting either American business or American consumers.”⁶¹

IV. CULPABILITY REQUIREMENTS OF ENVIRONMENTAL CRIMES

A. Knowing Violations

Many environmental statutes require “knowing” violations to obtain criminal convictions.⁶² Kevin A. Gaynor, Jodi C. Remer, and Thomas R. Bartman argue, however, that

[g]iven the serious nature of the crimes and the penalties involved, the complexity of the laws, and the broad applicability of the federal environmental laws to American society; a higher level of culpability should be imposed, either as a matter of prosecutorial discretion or through statutory amendment. This higher standard would establish a bright line between those environmental violations that are criminal and those that are civil and administrative, thereby guiding prosecutors and establishing standards of conduct that the public can understand.⁶³

They explain that, in the context of environmental statutes, “knowingly” has been interpreted by courts “not to require knowledge that one is violating the law, but merely requires an awareness of one’s act.”⁶⁴ Under this standard, the government may establish the knowledge element much easier than it could under

59. See generally Susan F. Mandiberg, *Moral Issues in Environmental Crime*, 7 FORDHAM ENVTL. L.J. 881 (1996) (discussing the interaction between regulatory and criminal law doctrines).

60. Fortney, *supra* note 45, at 1620.

61. *Id.*

62. Gaynor et al., *supra* note 10, at 4.

63. *Id.* at 4-5. In further support of changes to the environmental criminal system, they discuss the absence of mechanisms for uniform application of environmental laws. *Id.* at 5-11. While this may be an effective argument, changes could be made by Congress or other regulatory agencies to correct the problem. In addition, some writers argue that the prosecutorial discretion granted by environmental regulations is not really a problem at all. See, e.g., David A. Barker, Note, *Environmental Crimes, Prosecutorial Discretion, and the Civil/Criminal Line*, 88 VA. L. REV. 1387, 1388 (2002). While this issue should be considered, it will not be addressed in detail in this Note.

64. Gaynor et al., *supra* note 10, at 12.

non-environmental criminal statutes requiring knowledge.⁶⁵

The congressional history regarding the adoption of the knowledge standard under the Resource Conservation and Recovery Act (RCRA)⁶⁶, however, indicates that it was intended to give prosecutors the enforcement authority to address more egregious violations, but also protect “the rights of corporate executives whose knowledge of their companies’ waste disposal practices was incomplete.”⁶⁷ Therefore, by modifying the current environmental laws and their enforcement, clear lines could be drawn as to what is criminal and what is not, enabling well-intentioned actors to avoid criminal liability and the government to focus its resources on the worst offenders.⁶⁸

B. The Responsible Corporate Officer Doctrine

“Criminal liability is imputed to [a] corporation when three conditions have been met: a crime has been committed, the defendant employee is acting within the scope of his employment, and the defendant employee intended to benefit the corporation.”⁶⁹ Because corporations have no conscience and can express no remorse, prosecutors sometimes attempt to reach into corporations and impose liability on its officers and directors.⁷⁰ The theory used most commonly to impute responsibility in environmental actions is “the responsible corporate officer doctrine,” which stems from two U.S. Supreme Court cases.⁷¹

In *United States v. Dotterweich*,⁷² the president and general manager of a pharmaceutical company, Dotterweich, was prosecuted under the Federal Food, Drug, and Cosmetic Act.⁷³ Although he was unaware of the violation when it occurred and it was not alleged that he actively participated in the wrongdoing, he

65. *Id.* at 11.

66. 42 U.S.C. §§ 6901-6992 (2000).

67. Christopher Harris et al., *Criminal Liability for Violations of Federal Hazardous Waste Law: The “Knowledge” of Corporations and Their Executives*, 23 WAKE FOREST L. REV. 203, 207 (1988).

68. Gaynor et al., *supra* note 10, at 30-31.

69. Janet L. Woodka, Comment, *Sentencing the CEO: Personal Liability of Corporate Executives for Environmental Crimes*, 5 TUL. ENVTL. L.J. 635, 647 (1992).

70. *Id.* at 648.

71. *Id.* at 649. For a detailed description of the responsible corporate officer doctrine as applied to environmental law, see generally Lisa Ann Harig, Note, *Ignorance Is Not Bliss: Responsible Corporate Officers Convicted of Environmental Crimes and the Federal Sentencing Guidelines*, 42 DUKE L.J. 145 (1992) (arguing that the responsible corporate officer doctrine should only be applied to crimes having a scienter requirement insofar as it advances the goals of the criminal justice system and in favor of downward departures in sentencing under the Guidelines).

72. 320 U.S. 277 (1943).

73. *Id.* at 278.

was nevertheless held responsible as a result of his position in the company.⁷⁴ In *United States v. Park*,⁷⁵ another president of a large corporation, Park, was held liable under the Federal Food, Drug, and Cosmetic Act, despite his having delegated responsibility to lower level employees.⁷⁶ The Court explained that since Park was aware of previous violations and was in a supervisory position, he had a duty both to seek out violations and “to implement measures that will insure that violations will not occur.”⁷⁷ Moreover, the public has a right to expect that its health and well-being will be considered by “those who voluntarily assume positions of authority in business enterprises.”⁷⁸

Since *Park*, there has been “a ‘should have known’ standard of responsibility on corporate officers for activities or violations that they supervise.”⁷⁹ “Such an apparent abandonment of any mens rea standard raises disturbing questions when these officers are incarcerated without reference to whether or not they possessed culpable states of minds.”⁸⁰ The case has also been used, however, as a “defense to corporate officers because the presumption of responsibility arising from a corporate position may be rebutted with evidence that the corporate officer was “powerless” to prevent or correct the violation.”⁸¹ Moreover, the doctrine may be restricted to cases where the director either had direct control over the actions of the corporation or knew of previous violations.⁸²

C. Negligent Violations

Some statutes impose criminal liability merely by a showing of negligence.⁸³ Employing a negligence standard to criminally sanction corporate officers raises serious issues, namely whether it is just to imprison corporate officers for accidents that result from

74. *Id.* at 280-81.

75. 421 U.S. 658 (1975).

76. *Id.* at 660, 677.

77. *Id.* at 672.

78. *Id.*

79. Woodka, *supra* note 69, at 650.

80. Truxtun Hare, Comment, *Reluctant Soldiers: The Criminal Liability of Corporate Officers for Negligent Violations of the Clean Water Act*, 138 U. PA. L. REV. 935, 936 (1990). But see Jeffrey R. Escobar, Note, *Holding Corporate Officers Criminally Responsible for Environmental Crimes: Collapsing the Doctrines of Piercing the Corporate Veil and the Responsible Corporate Officer*, 30 NEW ENG. J. ON CRIM. & CIV. CONFINEMENT 305, 307 (2004) (arguing that RCRA and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) have made it nearly impossible to criminally prosecute corporate officers and advocating for a lower requisite mens rea than is statutorily provided).

81. Woodka, *supra* note 69, at 650 (quoting *Park*, 421 U.S. at 673).

82. *Id.* (citing *Park*, 421 U.S. at 673).

83. Gaynor et al., *supra* note 10, at 11; see also Federal Water Pollution Control Act, 33 U.S.C. § 1319(c)(1) (2000).

negligent decisions or actions and what is the requisite degree of negligence for criminal culpability.⁸⁴ Although some scholars argue that a negligence standard is necessary to deter people from engaging in particularly harmful activities,⁸⁵ others maintain "that to punish conduct without clear reference to an actor's state of mind 'is both inefficacious and unjust' and will not deter others from behaving similarly in the future."⁸⁶

V. BENEFIT-COST ANALYSIS IN THE DECISION-MAKING PROCESS OF POLLUTERS AND ENFORCERS

If economists are to advocate what they believe to be effective regulatory policy to environmental agencies and the legislature, they need to have an effective and reliable method of reaching their conclusions. One approach often employed by economists is benefit-cost analysis, which is "an economic tool for comparing the desirable and undesirable impacts of proposed policies."⁸⁷ Environmental benefits are often defined as the value of obtaining a cleaner environment, while costs are measured by the increased prices of meeting a regulatory objective.⁸⁸

Problems arise, however, in measuring the benefits and costs of environmental programs.⁸⁹ For one, many benefits and costs involve elements (such as health and aesthetics) for which there are no market values.⁹⁰ In addition, policy makers are often reluctant to attach monetary values to things such as human life.⁹¹ In response, economists have developed techniques for measuring the benefits of pollution control by determining the relationships between environmental quality and various goods.⁹² They have also directly questioned individuals about their valuation of environmental goods in an attempt to determine the value placed on an

84. Hare, *supra* note 80, at 938. Hare also questions whether a criminal negligence standard coupled with the responsible corporate officer doctrine violates the due process principles of the Constitution. *Id.* at 973-75.

85. *Id.* at 960 (citing 1 HOLMES-LASKI LETTERS 806 (M. Howe ed. 1953)).

86. *Id.* at 965 (quoting Herbert L. Packer, *Mens Rea and the Supreme Court*, 1962 SUP. CT. REV. 107, 109 (1962)).

87. Kenneth J. Arrow et al., *Is There a Role for Benefit-Cost Analysis in Environmental, Health, and Safety Regulation?*, 272 SCI. 221, 221 (1996). See generally Karen Palmer et al., *Tightening Environmental Standards: The Benefit-Cost or the No-Cost Paradigm?*, 9 J. ECON. PERSPECTIVES 119 (1995) (discussing the benefit-cost approach).

88. Arrow et al., *supra* note 87, at 221.

89. Maureen L. Cropper & Wallace E. Oates, *Environmental Economics: A Survey*, 30 J. ECON. LIT. 675, 677 (1992).

90. *Id.*

91. *Id.*

92. *Id.*

improved environment.⁹³

This benefit-cost framework for environmental programs, however, may not translate well to determining the appropriate punishment (for example, fines, imprisonment, and taxes) for environmental violations. That is, we do not necessarily want to ensure compliance with environmental regulations across the board; rather, we want to ensure compliance when society is best off without a breach and ensure just compensation to the parties harmed when society is better off if the actor does not comply with the regulation.

A. “Efficient Breach” of Environmental Regulations

Frank H. Easterbrook and Daniel R. Fischel have written that “[m]anagers have no general obligation to avoid violating regulatory laws, when violations are profitable to the firm.”⁹⁴ Under this theory, which is referred to as “efficient breach of public law,”⁹⁵ they explain:

[M]anagers do not have an ethical duty to obey economic regulatory laws just because the laws exist. They must determine the importance of these laws. The penalties Congress names for disobedience are a measure of how much it wants firms to sacrifice in order to adhere to the rules; the idea of optimal sanctions is based on the supposition that managers not only may but also should violate the rules when it is profitable to do so.⁹⁶

Other scholars have relied upon the idea of “efficient investment in compliance,”⁹⁷ which suggests that the maximum amount of money a firm should invest in order to comply with the law is determined by the maximum penalty for violations of a particular law, since it would be inefficient to invest more in compliance than one risks in fines.⁹⁸

Both of these views, however, have been subject to criticism for

93. *Id.*

94. Frank H. Easterbrook & Daniel R. Fischel, *Antitrust Suits by Targets of Tender Offers*, 80 MICH. L. REV. 1155, 1168 n.36 (1982).

95. Cynthia A. Williams, *Corporate Compliance with the Law in the Era of Efficiency*, 76 N.C. L. REV. 1265, 1324 (1998).

96. Easterbrook, *supra* note 94, at 1177 n.57.

97. Williams, *supra* note 95, at 1342.

98. David L. Engel, *An Approach to Corporate Social Responsibility*, 32 STAN. L. REV. 1, 43-45 (1979).

their lack of sound legal and political foundation.⁹⁹ Professor Cynthia Williams argues, for example, that these theories “understate the significance of law . . . [by] treating vast realms of law as simply a pricing scheme or set of tariffs on behavior.”¹⁰⁰ She refers to these types of theories as “the ‘law-as-price’ view of law”¹⁰¹ and maintains “that regulatory law should not be viewed as . . . something citizens are free to choose to ignore by accepting or risking the known consequences.”¹⁰² Professor Williams, although conceding that “[l]aw is functionally voluntary in the sense that each decision to follow the law is undertaken voluntarily,” argues that “[it] is not voluntary in the sense advocated by the law-as-price view, at least not in any serious philosophical way.”¹⁰³

While there may be morality problems and philosophical pitfalls with the price-as-law theories, they must not be dismissed on these bases alone. One of the main arguments against efficient breaches of environmental regulations is that economic arguments are steeped in theories that are either not supported by empirical data or, if relied upon by individuals and firms in their decision-making process, would create serious and irreversible problems in the “real world.” The rationales propounded by people who oppose the economic view (such as Professor Williams) are, however, similarly based on irrefutable theoretical and philosophical arguments.

In addition, those who oppose the economic view often fail to recognize the overall benefit to society that may be derived from an efficient breach, instead focusing only on the profits reaped by the offending firm. In deciding to take an economic opportunity that violates a law or regulation—or even acting in a way that negligently poses a risk of doing so—an individual or firm does not serve itself alone. Rather, the consumers of the firm’s products or services also derive some gain. If the cost to the actor becomes too high to engage in the activity,¹⁰⁴ then society is worse off because it is unable to receive the goods or services provided by that firm or is forced to do so at a higher price. By imposing fines instead of criminal sanctions, on the other hand, firms are able to build these costs into their prices, enabling the consumer to decide whether

99. Williams, *supra* note 95, at 1267.

100. *Id.*

101. *Id.*

102. *Id.* at 1270.

103. *Id.* Williams supports her view with the American Law Institute’s Tentative Draft of its Corporate Governance project, which maintains that the law-as-price arguments are “premised on a false view of the citizen’s duty in a democratic state.” *Id.* at 1271-72 (citing AMERICAN LAW INSTITUTE PRINCIPLES OF CORPORATE GOVERNANCE AND STRUCTURE: RESTATEMENT AND RECOMMENDATIONS § 2.01 cmt. f. (Tentative Draft No. 1, 1982)).

104. For example, if officials decide to impose sanctions such as jail time instead of prices such as fines. See *supra* Part II.B.1.

the good or service is worth the price.¹⁰⁵

Moreover, Williams' assertion that even though individuals balance the costs and benefits of their decisions about whether or not to comply with a law on a daily basis, there is something fundamentally wrong with firms doing the same is flawed. Rather, the opposite may in fact be true. Although individuals balance the costs and benefits of compliance, we put our reputation on the line each time we decide to violate a law or regulation. Officers of firms, on the other hand—especially those firms that have shareholders—are forced to make decisions based on what is in the firm's best interest. Therefore, the behavior of an officer or manager of a firm may be completely inelastic in his or her personal life—he or she refuses to break a law regardless of the potential benefit—but he or she may make a decision for the firm to violate a law or regulation because it is in the firm's best interest.¹⁰⁶

As a result, an individual or firm's decision about whether to violate a law or regulation—either intentionally as an efficient breach or by acting in a way that will increase its risk of violation—is going to be based on the type and extent of the enforcement mechanism in place. Although the American Law Institute (ALI) has opposed the law-as-price models, the American Bar Association's (ABA) Committee on Corporate Laws has provided “that criminal law is the only important mandatory law, and that intentional violations of civil law may not be problematic and may even be of social benefit in some instances.”¹⁰⁷ Thus, if economists hope to gather support for their positions that 1) law as price models, in some instances, benefit society as a whole and 2) individuals and firms will only intentionally breach laws (or perhaps even risk violating them) when the penalties imposed are civil as opposed to criminal, then they will have to put forth reliable empirical data proving the validity of these positions.¹⁰⁸

105. *But see* Bellew & Surtz, *supra* note 11, at 209 (arguing that criminal enforcement is preferable to civil fines because they “shatter corporations’ belief that civil fines are merely a license to pollute or a business cost that can be passed on to the consumer.”).

106. See, for example, *Smith v. Nat’l Transp. Safety Bd.*, 981 F.2d 1326, 1328 (D.C. Cir. 1993), in which Judge Douglas H. Ginsburg explained that the purpose of giving the public notice of the law

is so that each individual can act accordingly. Usually that means conforming to the law, but sometimes it means violating the law (or coming close and risking a violation) and accepting the known consequences of doing so—especially where a regulatory rather than a moral or criminal norm is concerned.

107. Williams, *supra* note 99, at 1275 (citing ABA Committee on Corporate Laws, *Changes in the Revised Model Business Corporation Act—Amendment Pertaining to the Liability of Directors*, 45 BUS. LAW. 695, 700-703 (1990)).

108. See Bruce L. Hay et al., *The Four Questions of Corporate Social Responsibility: May They, Can They, Should They, Do They?*, in ENVIRONMENTAL PROTECTION AND THE

*B. Problems with Efficient Breaches and with Eliminating
Environmental Crimes*

From an economic efficiency standpoint, society would be better off in many instances without criminal enforcement of environmental laws. Criminal sanctions deter actors from undertaking economic opportunities that benefit both themselves and consumers. Moreover, the threat of incarceration and the stigma that results from criminal prosecution can deter actors from engaging in behavior that merely creates a possibility that they will be subject to criminal enforcement—either because of the negligent behavior of an employee or because of liability under the responsible corporate officer doctrine. With all that said, however, serious problems may arise if environmental regulations are restricted to civil and administrative enforcement alone.

For one, the environment is not an unlimited resource. As a result, if individuals and firms are permitted to make decisions based on their overall benefit to society, then even taking into account the harm to the environment, the damage resulting from those decisions may have an increasing effect as natural resources are tainted and depleted. Not only are certain aspects of the environment limited in quantity, but some harm may be irreversible. For example, if a power company violates emissions regulations because it is less expensive to pay fines and/or civil penalties than to comply with the regulations, it may be impossible to ever return the air quality to the pre-pollution level. Further, even if the fines and civil penalties are allocated towards eradicating the harm caused by the breach, there is a strong likelihood that those funds will be diverted elsewhere or wasted as they move through the government bureaucracy.

Another problem presented by efficient breaches of environmental regulations is that the actors, even assuming they are altruistic, may still err in calculating the costs and benefits. One has to question whether we really want people to be guided by something other than the law.¹⁰⁹ If so, and a firm is incorrect in assessing the cost of the harm to the environment, then leading that firm to engage in some activity in which the costs actually outweigh the benefits means that not only is society not better off,

SOCIAL RESPONSIBILITY OF FIRMS: PERSPECTIVES FROM LAW, ECONOMICS, AND BUSINESS 1, 2 (Bruce L. Hay et al. eds., 2005) (“[T]heoretical arguments frequently have failed to take account of whether there is relevant, supporting empirical evidence.”).

109. See Daniel C. Esty, *On Portney's Complaint: Reconceptualizing Corporate Social Responsibility*, in ENVIRONMENTAL PROTECTION AND THE SOCIAL RESPONSIBILITY OF FIRMS, *supra* note 108, at 137, 137-43.

but the harm to the environment may be substantial and irreversible.

Moreover, issues arise with quantifying cost and benefit. First, there will almost always be an argument over what factors should be included in each calculation. Even if the factors are settled, however, there is the difficulty of placing a number on the harm to the environment as well as the detriment to human health and well-being due to that harm. Finally, in the unlikely instance that the factors have been agreed upon and the costs and benefits are quantifiable, the issue of unpredictability arises. That is, although a firm may be able to identify a specific cost per unit of pollution, for example, it is unlikely that the firm will be able to predict exactly how many units of pollution will, in fact, be caused by the activity.

VI. EMPIRICAL DATA ON THE EPA'S ENFORCEMENT PROGRAMS

While recognizing that there could be a myriad of explanations for some of the trends in the data as well as the potential problems created by the limited number of years I observed to draw inferences about those trends, the EPA's enforcement figures¹¹⁰ actually lend themselves to some favorable conclusions for economists. First, the number of environmental crime investigations undertaken is on the decline.¹¹¹ Second, the number of defendants charged with environmental crimes has decreased, although not as steadily as the number of investigations.¹¹² Third, the percentage of investigations resulting in defendants being charged has increased significantly since 2003,¹¹³ which demonstrates that the EPA may only be choosing to pursue the most egregious offenders who will be most easily prosecuted. Fourth, although it is difficult to draw inferences about the number of years of incarceration without more information, namely the number of defendants convicted as well as the years of incarceration each defendant faced), the figures somewhat resemble those of the number of defendants charged.¹¹⁴ If true, this would suggest that prison sentences have not grown harsher. Finally, the level of civil judicial penalties rose between 2002 and 2005, while the administrative penalties have similarly increased since 2003.¹¹⁵

110. *See infra* fig.1.

111. *See infra* fig.2.

112. *See id.*

113. *See id.*

114. *See infra* fig.3.

115. *See infra* fig.4.

A number of the inferences I draw from the EPA's figures are appealing from an economist's point of view. The fact that the number of environmental crime investigations has decreased steadily since 2002 suggests that the EPA may be seeking to enforce its regulations less through criminal sanctions and more through civil and administrative penalties. One could argue, perhaps, that the prior criminal prosecutions served a deterrent effect, causing individuals and firms to violate environmental regulations less frequently, which in turn forced the EPA to taper its criminal enforcement without actually choosing to do so. However, the significant increase in civil judicial penalties from 2002 through 2005 suggests that the EPA may in fact have intentionally sought civil penalties in instances in which it had previously sought criminal prosecution of the offender.

Next, the number of defendants charged with environmental crimes has declined from its 2000 level, but not at the rate at which the number of investigations has decreased. Taken together, these figures indicate that the percentage of investigations resulting in defendants charged has increased since 2003. As mentioned above, this may suggest that the EPA is only choosing to investigate the most egregious violators against whom it will have the easiest time building a case. If this inference is true, and the EPA is seeking criminal enforcement against repeat offenders, one of the legal goals of criminal laws—remediation—may be served. Moreover, by pursuing fewer criminal investigations, the EPA is saving valuable resources and tax dollars as well as leaving individuals to serve as productive members of society rather than as a drain on tax dollars in prison.

VII. SUGGESTIONS FOR EFFECTIVE ENFORCEMENT OF ENVIRONMENTAL REGULATIONS

Throughout this Note I have pointed out the problems that hinder effective enforcement of environmental laws. In this Part, I discuss some ideas that have been proposed in order to improve, and in some instances revolutionize, the enforcement scheme of environmental laws.

A. Elevated Mens Rea Standard

Elevating the culpability level necessary for criminal conviction of environmental regulations could go a long way to protect firms from arbitrary and overly harsh sanctions. By forcing the government to demonstrate a higher standard of specific intent, a bright

line between criminal enforcement and civil or administrative enforcement would be created.¹¹⁶ As a result, the government could focus its resources on the worst offenders—those who know that their actions violate the law.¹¹⁷ Alternatively, Congress could specify that “knowingly” means knowledge of the law being violated, which would also indicate to law enforcement agencies that the level of culpability must be substantial before criminal prosecution can be pursued.¹¹⁸

B. Tailored Enforcement

Critics of applying traditional criminal theories to environmental regulations have suggested that the two cannot be combined because it is like trying to fit a square peg into a round hole. That is, environmental criminal laws approach corporate decisions and actions as being just as unitary and rational as an individual’s when few would actually argue that such is the case.¹¹⁹ Scholars refer to this disconnect as the “black-box” theory of the firm.¹²⁰ Under the black-box line of argument, environmental criminal sanctions of corporations are justified because the corporations are rational polluters that violate environmental laws if it proves to be more cost-effective.¹²¹ Evidence has shown, however, that corporate decisionmakers do, in fact, account for non-monetary factors.¹²² Therefore, the black-box model of firm behavior is a major flaw in the environmental criminal law system.¹²³

If we accept that the black-box model is the “root cause” of the problems with the current environmental enforcement scheme, then implementing a new and more realistic model seems to be the only acceptable option.¹²⁴ Rather than using a “one-size-fits-all” enforcement regime, perhaps it is more appropriate to penalize offenders differently for the same offense according to their organization type.¹²⁵ This idea is described as “tailored enforcement.”¹²⁶ Because organizations have different motives, structures, and decision-making processes, they respond differently to incentives and

116. Gaynor et al., *supra* note 10, at 29.

117. *Id.*

118. *Id.* at 30.

119. Fortney, *supra* note 45, at 1629.

120. *Id.*

121. David B. Spence, *The Shadow of the Rational Polluter: Rethinking the Role of Rational Actor Models in Environmental Law*, 89 CAL. L. REV. 917, 919-21 (2001).

122. *Id.* at 970.

123. Fortney, *supra* note 45, at 1630.

124. *Id.* at 1631.

125. *Id.*

126. *Id.*

sanctions.¹²⁷ Therefore, by recognizing “target” enforcement strategies for each organization type, some of the disparate impact caused by enforcement of environmental crimes will be eliminated.¹²⁸ Moreover, tailored enforcement would enable the government to accomplish its goals more effectively with its limited resources.¹²⁹

C. Financial Assurance or “Bonding”

A fundamental principle of environmental regulation is that pollution costs should be paid for by their creators.¹³⁰ Problems arise, however, when environmental obligations are avoided because of the polluter’s bankruptcy, corporate dissolution, or outright abandonment.¹³¹ Financial assurance rules, or bonding requirements, may address these problems.¹³²

“Assurance rules require potential polluters to demonstrate—before the fact—financial resources adequate to correct and compensate for environmental damages that may arise in the future.”¹³³ Assurance rules enable firms to determine on their own whether and to what extent they will engage in activities that harm the environment.¹³⁴ This freedom, however, is checked by “the expertise and scrutiny of private, third-party financial providers,” such as “the insurers, sureties, and banks that provide the financial products used to demonstrate compliance.”¹³⁵ Thus, “assurance rules can yield a flexible, market-based approach to compliance and monitoring.”¹³⁶ In addition, mandatory assurance addresses insolvency directly and increases the effectiveness of environmental regulation.¹³⁷

VIII. CONCLUSION

As the environment moves to the forefront of social concern and

127. *Id.*

128. *Id.* at 1632-33.

129. *Id.* at 1634. For a full discussion of the theory of tailored enforcement see *id.* at 1631-35.

130. James Boyd, *Financial Responsibility for Environmental Obligations: Are Bonding and Assurance Rules Fulfilling Their Promise?* 1 (Res. for the Future Discussion Paper No. 01-42, 2001), available at <http://www.rff.org/Documents/RFF-DP-01-42.pdf>.

131. *Id.*

132. *Id.*

133. *Id.*

134. *Id.*

135. *Id.*

136. *Id.* at 2.

137. *Id.* at 3.

political debate, the decision concerning what methods should be available for enforcement of environmental statutes is paramount. In order to make the best policies for all of the interested parties, it is essential that officials are aware of the breadth of legal and economic arguments. As a result, scholars must continue to explore the efficacy of criminal, civil, and administrative enforcement of the many environmental regulations. They should do so, however, not merely by discussing theories—and not even by presenting empirical data alone—but by performing empirical studies and relating their results to theory and policy in a meaningful way.¹³⁸ Some important questions to examine in determining the appropriate enforcement mechanism of each potential violation include 1) the desired level of deterrence; 2) the extent of harm that would be caused to the environment and public health by a violation; 3) the benefit to society that would result from breach; 4) the designated culpability/mens rea requirement; and 5) the amount of resources required to successfully carry out the enforcement program. Finally, as scholars and officials continue to examine different theories, policies, and outcomes, they should remain open to the possibility that this unique area of the law requires its own unique system of regulation.

138. See Steven P. Solow, *The State of Environmental Crime Enforcement: An Annual Survey*, 37 ENVTL. REP. 1, 2 (2006):

The lack of data, however, is not the complete answer. Data by itself does not “prove” anything. Data can serve to support, or not, a particular theory. Thus, what any of us knows or does not know about white-collar (or the subset of environmental) crime is not simply a result of the lack of good data. It is because there has never been a sufficient effort to marry data gathering with a meaningful *theory* about the causes and cures of corporate crime. Without that effort, the mere aggregation of data does little. In the absence of data, many of the theories about corporate crime control are either based on adherence to one doctrinaire approach or another, or on the wide-spread process of reasoning by anecdote.

FIGURE 1**Criminal Penalties:**

<i>Year</i>	<i>Years of Incarceration</i>	<i>Environmental Criminal Investigations</i>	<i>Defendants Charged</i>	<i>Value of Fines and Restitution (millions)</i>
2000	146	477	360	122
2001	212	482	372	95
2002	215	484	325	62
2003	146	471	247	71
2004	77	425	293	47
2005	186	372	320	100
2006	154	305	278	43

Civil/Administrative Penalties (in millions):

<i>Year</i>	<i>Injunctive Relief</i>	<i>Civil Judicial Penalties</i>	<i>Administrative Penalties</i>	<i>Value of SEPs*</i>	<i>Stipulated Penalties</i>
2000	1600	55	29	56	NC**
2001	4500	102	24	89	NC**
2002	3900	64	26	58	4
2003	2900	72	24	65	128
2004	4800	121	28	48	68
2005	10,000	127	27	57	4
2006	4900	82	42	78	10

Total Monetary Penalties (in millions):

<i>Year</i>	<i>Total Monetary Penalties</i>	<i>Total without Injunctive Relief</i>
2000	2699.5	258.5
2001	4611	310
2002	4070	200
2003	3168	360
2004	5065	312
2005	10,215	315
2006	5112	255

* Supplemental Environmental Projects

** Not Collected

Source: U.S. Environmental Protection Agency, Data, Planning, and Results: Annual Results, <http://www.epa.gov/compliance/data/results/annual/index.html> (last visited Nov. 16, 2007).

For years 2000-2004, see U.S. EPA, END-OF-YEAR ENFORCEMENT AND COMPLIANCE FIVE YEAR TRENDS (2004), *available at* <http://www.epa.gov/compliance/resources/reports/endofyear/eoy2004/fy045yeartrend.pdf>. For the year 2005, see U.S. EPA, COMPLIANCE AND ENFORCEMENT ANNUAL RESULTS, NUMBERS AT A GLANCE: FISCAL YEAR 2005 (2005), *available at* <http://www.epa.gov/compliance/resources/reports/endofyear/eoy2005/2005numbers.pdf>. For the year 2006, see U.S. EPA, COMPLIANCE AND ENFORCEMENT ANNUAL RESULTS, NUMBERS AT A GLANCE: FISCAL YEAR 2006 (2006), *available at* <http://www.epa.gov/compliance/resources/reports/endofyear/eoy2006/fy2006numbers.pdf>.

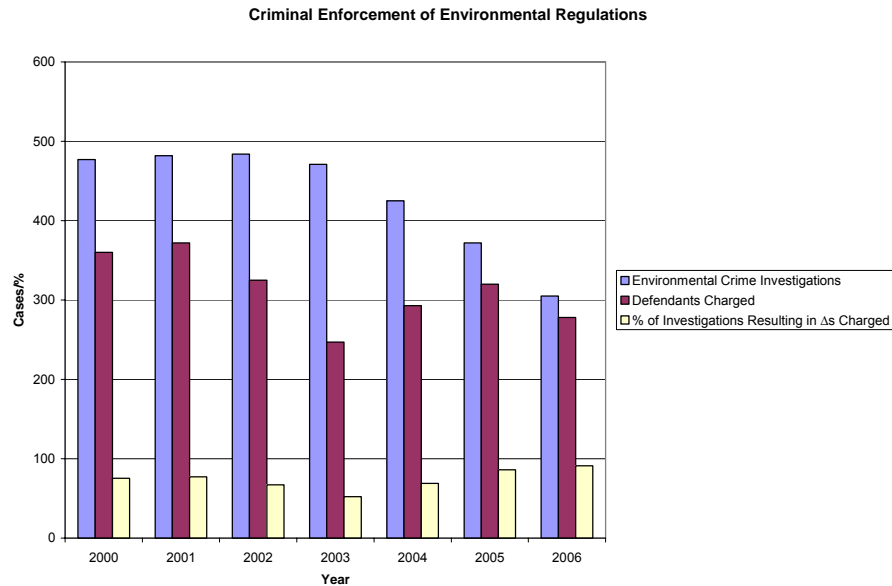
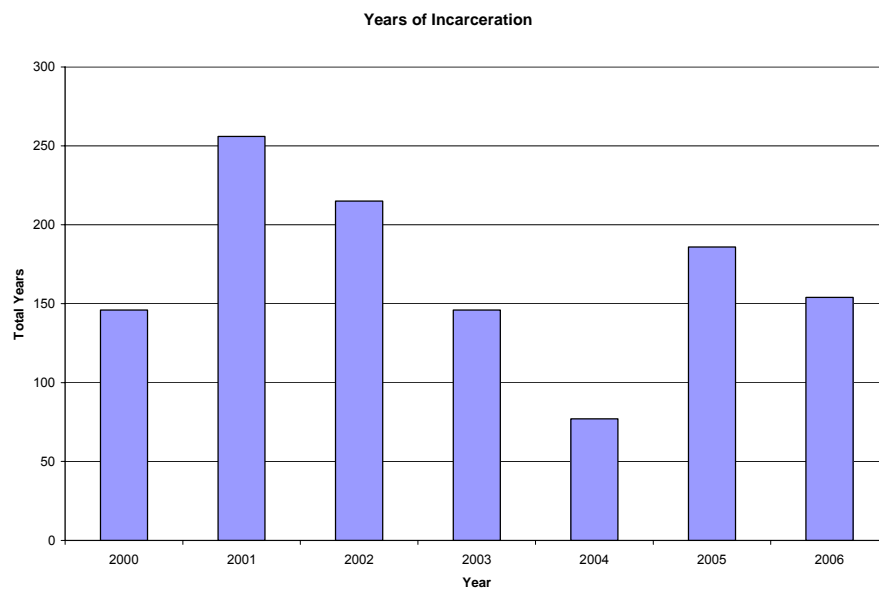
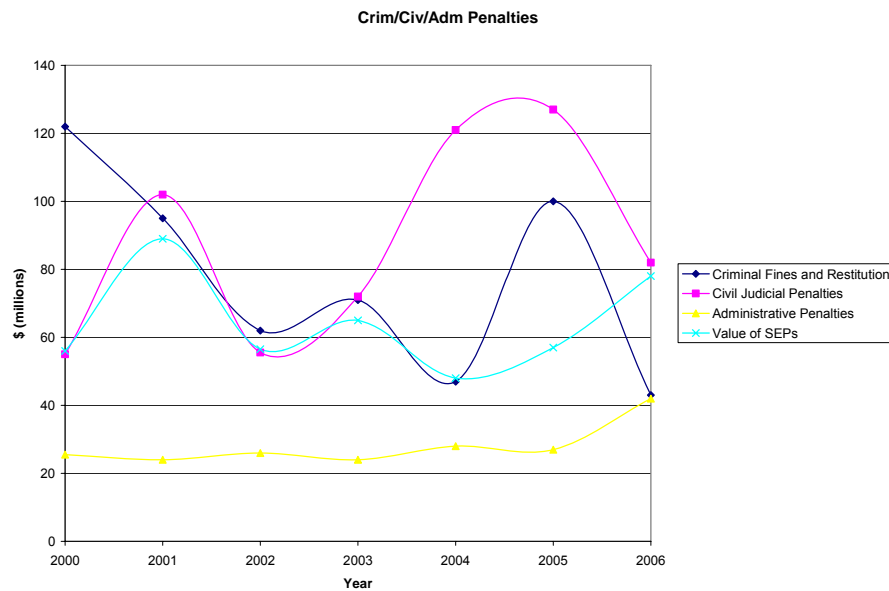
FIGURE 2

FIGURE 3**FIGURE 4**

**RECENT DEVELOPMENTS:
THE CHANGING TIDE OF LAND USE
AND ENVIRONMENTAL LAW**

RUTH JACKSON LEE¹

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A single breaker may recede; but the tide is evidently coming in.”²

I. INTRODUCTION

Not unlike the ocean's boundary, the law remains in constant flux, requiring continuing evaluation to monitor its direction of change. Especially in the areas of land use and environmental law, change does not necessarily represent progress towards the eminent goal of advancing efficient laws that fairly protect important competing interests. The court's attempt to balance these vying concerns can be observed in the frequency of litigation, numerous split decisions, and countless conflicting legal standards. Indeed, an escalating number of cases and legislation in 2007 contemplate the growing influence of land use and environmental law. This Article merely features a few of the noteworthy decisions and statutory developments from the past year, helping to gauge the tide of federal and Florida law.

II. FEDERAL CASE LAW

Environmental Defense v. Duke Energy Corp., 127 S.Ct. 1423
(2007)

In *Environmental Defense v. Duke Energy Corp.*, a unanimous decision³ delivered by Justice Souter, the United States Supreme

1. J.D., December 2007, Florida State University College of Law.

2. THOMAS B. MACAULAY, SOUTHEY'S COLLOQUIES ON SOCIETY (1830), *reprinted in* LITERARY ESSAYS CONTRIBUTED TO THE EDINBURGH REVIEW, at 94 (Oxford University Press 1913) *available at* <http://www.econlib.org/library/Essays/macS1.html>.

3. Justice Thomas filed a concurring opinion expressing disagreement with a narrow part of the Court's statutory interpretation analysis.

Court reinforced a long-standing effort to compel power plants to install the best available emissions-control technology.⁴ The United States, along with multiple environmental groups,⁵ alleged that Duke Energy Corporation (Duke) offended the Clean Air Act⁶ (CAA) when it improved components of coal-fired electric generating units at eight power plants located in North Carolina and South Carolina.⁷ Specifically, the petitioners argued that Duke violated the Prevention of Significant Deterioration (PSD) provisions of the CAA by failing to obtain permits before refurbishing the units and by not employing Best Available Control Technology (BACT), as is required for major modifications that significantly increase the net annual discharge of pollution.⁸

The case turned on the Environmental Protection Agency's (EPA) definition of the term "modification" which had been interpreted differently under the Clean Air Act's two air pollution control programs: the New Source Performance Standards (NSPS) and PSD.⁹ The EPA construed modification in the NSPS regulations to be an increase in hourly emission rates, while defining modification as an increase in annual emissions over the actual baseline emissions in the PSD regulations.¹⁰ Adopting the former interpretation, both the trial court and the Court of Appeals for the Fourth Circuit determined that Congress intended the EPA to evaluate modifications based on their impact on the hourly rate of emissions.¹¹ Thus, the lower courts held that Duke did not have to obtain PSD permits or utilize BACT because the hourly rate of emissions remained unchanged, even though the improvements prolonged the plants' daily operation and increased the total emissions released.¹²

The Supreme Court reversed, ruling that harmonizing the meaning of modification under the PSD regulations to the NSPS counterpart was "too far a stretch" as it would effectively invalidate the PSD regulations.¹³ Borrowing language from *Atlantic Cleaners & Dyers, Inc. v. United States*,¹⁴ the Court explained that

4. See 127 S.Ct. 1423 (2007).

5. The Environmental Defense, North Carolina Sierra Club, and North Carolina Public Interest Research Group Citizen Lobby/Education Fund.

6. Clean Air Act Amendments of 1977, Pub. L. No. 95-95, 91 Stat. 685 (codified as amended in scattered sections of 42 U.S.C.).

7. 127 S.Ct. at 1431.

8. *Id.*

9. See *id.* at 1430.

10. *Id.*

11. *Id.*

12. *Id.*

13. *Id.* at 1434.

14. 286 U.S. 427, 433 (1932).

“most words have different shades of meaning. . . . A given term in the same statute may take on distinct characters from association with distinct statutory objects calling for different implementation strategies.”¹⁵ Vacating the Fourth Circuit’s decision, the Court announced that the PSD regulations may define modification in terms of annual instead of hourly emissions increase.¹⁶ This landmark decision demonstrates the Court’s subtle shift towards a more expansive approach of environmental regulation enforcement.¹⁷

Massachusetts v. Environmental Protection Agency, 127 S.Ct. 1438 (2007)

In *Massachusetts v. Environmental Protection Agency*, the first case involving climate change to reach the United States Supreme Court, a 5-4 opinion¹⁸ established that the CAA not only grants the EPA the statutory authority to regulate greenhouse gases produced by new motor vehicles, but the CAA obligates the EPA to regulate emissions if it finds that greenhouse gases “may reasonably be anticipated to endanger the public health or welfare.”¹⁹ The decision, penned by Justice Stevens, overturned the EPA’s denial of a request filed by Massachusetts and eleven other states,²⁰ as well as local governments²¹ and environmental groups,²² to regulate greenhouse gas emissions from the transportation sector.²³ Perhaps more important than the specific holding, the Supreme Court accepted climate change as a legal presumption.²⁴

In 1999, a coalition of 19 private organizations²⁵ filed a rule-

15. 127 S.Ct. at 1432.

16. *Id.* at 1434.

17. See generally Richard J. Lazarus, *Fairness in Environmental Law*, 27 ENVTL. L. 705, 716 (1997) (recognizing that CAA as well as other environmental regulations are “products of innovative and expansive interpretations of existing statutory language”).

18. The opinion of the Court was joined by Justices Kennedy, Souter, Ginsburg, and Breyer.

19. 127 S.Ct. 1438 (2007).

20. California, Connecticut, Illinois, Maine, New Jersey, New Mexico, New York, Oregon, Rhode Island, Vermont, and Washington.

21. District of Columbia, American Samoa, New York City, and Baltimore.

22. Center for Biological Diversity, Center for Food Safety, Conservation Law Foundation, Environmental Advocates, Environmental Defense, Friends of the Earth, Greenpeace, International Center for Technology Assessment, National Environmental Trust, Natural Resources Defense Council, Sierra Club, Union of Concerned Scientists, and U.S. Public Interest Research Group.

23. See 127 S.Ct. at 1438-63.

24. *Id.* at 1440. (“Global temperatures has coincided with a significant increase in the concentration of carbon dioxide in the atmosphere.”).

25. Alliance for Sustainable Communities; Applied Power Technologies, Inc.; Bio Fuels America; The California Solar Energy Industries Assn.; Clements Environmental Corp.; Environmental Advocates; Environmental and Energy Study Institute; Friends of the

making petition with the EPA requesting that it develop regulatory standards for four greenhouse gases emitted by automobiles: carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons.²⁶ The petition asserted that the emissions were “air pollutants” that “may reasonably be anticipated to endanger public health or welfare” and must be regulated by the EPA under section 202(a)(1) of the CAA.²⁷ Indeed, “air pollutant” is broadly defined by the CAA to include “any air pollution agent or combination of such agents . . . which is emitted into or otherwise enters the ambient air.”²⁸ Nevertheless, the EPA issued an order denying the rulemaking petition stating that:

(1) contrary to the opinions of its former general counsels, the Clean Air Act does not authorize the EPA to issue mandatory regulations to address global climate change; and (2) that even if the agency had the authority to set greenhouse gas emission standards, it would be unwise to do so at this time.”²⁹

Petitioners were joined by Massachusetts and other state and local governments, seeking review of the EPA's order in the Court of Appeals for the D.C. Circuit, but a divided panel ruled in favor of EPA.³⁰

The Supreme Court narrowly reversed the lower court's ruling on appeal. First, the Court discussed standing and rejected the EPA's argument that the damage caused by greenhouse gases is too widespread for Massachusetts and the other petitioners to fall within the harm requirement of the federal courts under Article III of the U.S. Constitution.³¹ Rather, the Court reasoned that the EPA's refusal to regulate greenhouse gas emissions constitutes an “actual and imminent” risk of harm to Massachusetts.³² The

Earth; Full Circle Energy Project, Inc.; The Green Party of Rhode Island; Greenpeace USA; International Center for Technology Assessment; Network for Environmental and Economic Responsibility of the United Church of Christ; New Jersey Environmental Watch; New Mexico Solar Energy Assn.; Oregon Environmental Council; Public Citizen; Solar Energy Industries Assn.; The SUN DAY Campaign.

26. *Id.* at 1449.

27. *Id.* (citing 42 U.S.C. § 7521(a)(1)). The provision requires the Administrator of the EPA to set emission standards for “any air pollutant” from new motor vehicles or new motor vehicle “which in his judgment cause[s], or contribute[s] to, air pollution which may reasonably be anticipated to endanger public health or welfare.”

28. 42 U.S.C. § 7602(g).

29. 127 S.Ct. at 1450.

30. *Id.* at 1451.

31. *Id.* at 1453.

32. *Id.* at 1455.

Court added that there was a “substantial likelihood that the judicial relief requested’ [would] prompt [the EPA] to take steps to reduce that risk.”³³ As such, Massachusetts had standing to bring the claim.

Then, reviewing the merits of the case, the majority immediately disposed of the EPA’s contention that carbon dioxide is not an “air pollutant” ruling instead that the CAA’s “sweeping definition” of the term encompasses all greenhouse gases.² Additionally, the Court held that “[i]f EPA makes a finding of endangerment, the CAA requires the agency to regulate emissions of the deleterious pollutant from new motor vehicles.”³⁴ The Court ultimately concluded that the EPA’s refusal “to decide whether greenhouse gases cause or contribute to climate change” was arbitrary and capricious.³⁵

Two of the conservative members of the Court authored dissenting opinions. Chief Justice Roberts’ dissent³⁶ insisted that the legal challenges were nonjusticiable because Massachusetts did not meet its burden “of alleging an injury that is fairly traceable to the [EPA’s] failure to promulgate new motor vehicle greenhouse gas emission standards, and that is likely to be redressed by the prospective issuance of such standards.”³⁷ Justice Scalia’s dissent,³⁸ on the other hand, analyzed the merits of the case, contending that the EPA’s interpretation of “air pollutant” is not only reasonable, but “is far more plausible than the Court’s alternative.”³⁹

National Ass’n of Home Builders v. Defenders of Wildlife, 127
S.Ct. 2518 (2007)

In another 5-4 decision,⁴⁰ the United States Supreme Court settled a procedural conflict between competing provisions of the Clean Water Act⁴¹ (CWA) and the Endangered Species Act⁴² (ESA)

33. *Id.* (citing *Duke Power Co. v. Carolina Environmental Study Group, Inc.*, 438 U.S. 59, 79 (1978)).

34. *Id.* at 1462 (“EPA can avoid taking further action only if it determines that greenhouse gases do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do.”).

35. *Id.* at 1463.

36. Justice Roberts’ dissent was joined by Justices Scalia, Thomas, and Alito.

37. *Id.* (Roberts, J., dissenting).

38. Justice Scalia’s dissent was joined by Justices Roberts, Thomas, and Alito.

39. *Id.* at 1476 (Scalia, J., dissenting).

40. The opinion of the Court was joined by Justices Roberts, Scalia, Kennedy, and Thomas.

41. Clean Water Act of 1977, Pub. L. No. 95-217, 91 Stat. 1566 (codified as amended in scattered sections of 33 U.S.C.).

42. Endangered Species Act of 1973, Pub. L. No. 93-205 § 2, 87 Stat. 884 (codified as

in *National Ass'n of Home Builders v. Defenders of Wildlife*.⁴³ Justice Alito, writing for the majority, succinctly explained the legal dilemma:

Section 402(b) of the [CWA] requires that the [EPA] transfer certain permitting powers to state authorities upon an application and a showing that nine specified criteria have been met.⁴⁴ Section 7(a)(2) of the [ESA] provides that a federal agency must consult with agencies designated by the Secretaries of Commerce and the Interior in order to “insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species.”⁴⁵

The focus of the dispute was the EPA’s decision to approve the transfer of the CWA’s permitting authority to Arizona.⁴⁶ Defenders of Wildlife argued that in addition to the CWA’s nine requirements set forth in Section 402(b), the EPA must additionally consider whether the transfer of permitting authority jeopardizes endangered or threatened species under Section 7(a)(2) of the ESA. In a split decision, the Court of Appeals for Ninth Circuit ruled “that the EPA’s approval of the transfer was arbitrary and capricious because the EPA ‘relied during the administrative proceedings on legally contradictory positions regarding its section 7 obligations.’”⁴⁷

Deferring to the EPA’s reasonable interpretation, the majority reversed the appellate court’s holding and ruled that Section

amended at 16 U.S.C. §§ 1531-1544 (1985 & Supp. 1997)).

43. 127 S.Ct. 2518 (2007).

44. The State must demonstrate that it has the ability: (1) to issue fixed-term permits that apply and ensure compliance with the CWA’s substantive requirements and which are revocable for cause; (2) to inspect, monitor, and enter facilities and to require reports to the extent required by the CWA; (3) to provide for public notice and public hearings; (4) to ensure that the EPA receives notice of each permit application; (5) to ensure that any other State whose waters may be affected by the issuance of a permit may submit written recommendations and that written reasons be provided if such recommendations are not accepted; (6) to ensure that no permit is issued if the Army Corps of Engineers concludes that it would substantially impair the anchoring and navigation of navigable waters; (7) to abate violations of permits or the permit program, including through civil and criminal penalties; (8) to ensure that any permit for a discharge from a publicly owned treatment works includes conditions requiring the identification of the type and volume of certain pollutants; and (9) to ensure that any industrial user of any publicly owned treatment works will comply with certain of the CWA’s substantive provisions. *Id.* at 2525 n. 2 (citing §§ 1342(b)(1)-(9)).

45. *Id.* at 2524-25.

46. *Id.* at 2527.

47. *Id.* at 2528.

7(a)(2) of the ESA only applies to discretionary agency actions of federal agencies.⁴⁸ Essentially, because the EPA's transfer of permitting authority was a nondiscretionary action, it was merely required to consider the nine criteria set forth in the CWA.⁴⁹ Justice Steven asserted in his dissent⁵⁰ that the ESA's requirements applied to both discretionary and non-discretionary agency decisions and that its interpretation does not warrant deference because "[t]he Departments of the Interior and Commerce, not EPA, are charged with administering the ESA."⁵¹ In a separate dissenting opinion, Justice Breyer expressed that "the majority cannot possibly be correct in concluding that the structure of § 402(b) precludes application of § 7(a)(2) to the EPA's discretionary action. That is because grants of discretionary authority always come with *some* implicit limits attached."⁵²

United Haulers Ass'n, Inc. v. Oneida-Herkimer Solid Waste, 127 S.Ct. 1786 (2007)

In *United Haulers Ass'n, Inc. v. Oneida-Herkimer Solid Waste*, a plurality opinion delivered by Chief Justice Roberts,⁵³ the United States Supreme Court upheld the constitutionality of a county ordinance requiring haulers to bring waste to government owned facilities.⁵⁴ Both Oneida and Herkimer Counties adopted a local "flow control" ordinance requiring locally-produced garbage to be delivered to particular processing facilities owned by the Oneida-Herkimer Solid Waste Management Authority (Authority), a public benefit corporation.⁵⁵ The Authority collected tipping fees to cover its expenses. Although the charge far exceeded the open market rate, it "allowed the Authority to do more than the average private waste disposer."⁵⁶

The United Haulers Association filed an action against the Counties and the Authority under Rev. Stat. § 1979, 42 U.S.C. § 1983, alleging that the flow control laws violated the Commerce Clause by discriminating against interstate commerce.⁵⁷ The peti-

48. *Id.* at 2535.

49. *Id.* at 2530.

50. The opinion was joined by Justices Souter, Ginsburg, and Breyer.

51. *Id.* at 2542-44 (Stevens, J., dissenting).

52. *Id.* at 2552 (Breyer, J., dissenting).

53. Justices Souter, Ginsburg and Breyer joined the opinion in full. Justice Scalia concurred in part and filed an opinion. Justice Thomas concurred in judgment and filed an opinion.

54. 127 S.Ct. 1786.

55. *Id.* at 1791.

56. *Id.*

57. *Id.* at 1792.

tioner submitted evidence that solid waste could be disposed if at out-of-state facilities for much less expense without the flow ordinance.⁵⁸ Relying on *C & A Carbone, Inc. v. Clarkstown*,⁵⁹ the district court enjoined the enforcement of the Counties' laws.⁶⁰ The Court of Appeals for the Second Circuit conversely ruled that a statute does not discriminate against interstate commerce simply because "it favors local government at the expense of all private industry."⁶¹ However, the case was remanded to determine whether the flow control laws placed an incidental burden on interstate commerce and, if so, whether the benefits of the ordinance outweighed that burden.⁶² The district court subsequently found that the petitioners did not show that the ordinances imposed any cognizable burden on interstate commerce. The Second Circuit affirmed in judgment.⁶³

On appeal, the Supreme Court similarly affirmed the Second Circuit's decision upholding the ordinance.⁶⁴ The Court distinguished the Counties' ordinances from regulations previously rendered unconstitutional where the favored waste-disposal facilities were publicly operated.⁶⁵ "The flow control ordinances in this case," Chief Justice Roberts noted, "benefit a clearly public facility, while treating all private companies exactly the same."⁶⁶

In the final part of the opinion, the Court applied the test set forth in *Pike v. Bruce Church, Inc.*⁶⁷ Under the *Pike* test, a nondiscriminatory statute is upheld "unless the burden imposed on [interstate] commerce is clearly excessive in relation to the putative local benefits."⁶⁸ The Court determined that the flow control laws survive the *Pike* test because "any arguable burden the ordinances impose on interstate commerce does not exceed their public benefits."⁶⁹

Justice Scalia joined the plurality opinion by concurring in judgment, but argued in a separate opinion that the *Pike* test was inappropriately applied.⁷⁰ In another concurrence, Justice Thomas

58. *Id.*

59. 511 U.S. 383 (1994).

60. 127 S.Ct. at 1792.

61. *Id.*

62. *Id.*

63. *Id.*

64. *Id.* 1797.

65. *Id.* 1794-95.

66. *Id.* at 1796. ("Unlike private enterprises, the government is vested with the responsibility of protecting the health, safety, and welfare of its citizens."). *Id.* at 1785.

67. 397 U.S. 132 (1970).

68. 127 S.Ct. at 1797 (citations omitted).

69. *Id.* at 1798.

70. *Id.* at 1798 (J. Scalia, concurring) ("[T]he balancing of various values is left to Congress—which is precisely what the Commerce Clause (the *real* Commerce Clause) envi-

stated that *Carbone* was incorrectly decided.⁷¹ In his dissent, however, Justice Alito⁷² maintained that the ordinances were “essentially identical to the ordinance invalidated in *Carbone*” and therefore unconstitutionally discriminated against interstate commerce.⁷³

United States v. Atlantic Research Corp., 127 S.Ct. 2331 (2007)

In *United States v. Atlantic Research Corp.*, the United States Supreme Court unanimously held that a potentially responsible party (PRP) may recover the costs it incurs in responding to environmental contamination from other PRPs under the Comprehensive Environmental Response Compensation and Liability Act⁷⁴ (CERCLA).⁷⁵ Writing for the majority, Justice Thomas clarified uncertainties regarding the ability of private parties to sue for contributions from other parties after voluntarily cleaning up a contaminated site.⁷⁶

Atlantic Research leased property at a naval ammunition depot operated by the United States Department of Defense.⁷⁷ Atlantic Research retrofitted rocket motors for the federal government using a high-pressure water spray to remove pieces of propellant.⁷⁸ The propellant pieces were then burned, contaminating soil and groundwater at the site.⁷⁹

Upon cleaning the site, Atlantic sued the United States under both section 107(a) and 113(f) of CERCLA, seeking partial reimbursement for the costs it incurred.⁸⁰ While litigation was pending, the Supreme Court ruled in *Cooper Industries, Inc. v. Aviall Services, Inc.*,⁸¹ that a party cannot bring a section 113(f) claim for contribution unless it is already the subject of a section 107(a) contamination action.⁸² Accordingly, Atlantic Research filed a new claim for contribution under section 107(a) which was subsequently dismissed by a district court.⁸³ The Court of Appeals for

sions.”) (emphasis in original).

71. *Id.* at 1799 (J. Thomas, concurring).

72. Justice Alito’s dissent was joined by Justices Stevens and Kennedy.

73. *Id.* at 1803.

74. Pub. L. No. 96-510, 94 Stat. 2767 (1980) (codified at 42 U.S.C. §§ 9601-75 (2007)).

75. 127 S.Ct. 2331 (2007).

76. *See id.*

77. *Id.* at 2335.

78. *Id.*

79. *Id.*

80. *Id.*

81. 543 U.S. 157 (2004).

82. 127 S.Ct. at 2335.

83. *Id.*

the Eighth Circuit reversed.⁸⁴

The Supreme Court affirmed the appellate court's ruling that Section 107(a) of CERCLA allows PRPs to sue other PRPs for cost recovery.⁸⁵ Under section 107(a), PRPs are liable for "(A) all costs of removal or remedial action incurred by the United States Government or a State or an Indian tribe not inconsistent with the national contingency plan; [and] (B) any other necessary costs of response incurred by *any other person* consistent with the national contingency plan."⁸⁶ The Government argued that the phrase "any other person" in Section 107(a) includes only non-PRPs.⁸⁷ But the Court held that "the Government's interpretation makes little textual sense" based on the plain terms of the statute.⁸⁸ As Justice Thomas explained, section 107(a)(4) must be read to provide a cause of action to any party other than the United States, a State or an Indian tribe.⁸⁹ The decision recognized a policy of encouraging remediation of contaminated sites by assuring PRPs that incurred expenses can be recovered from responsible parties.

Lombardi v. Whitman, 485 F.3d 73 (2nd Cir. 2007)

In *Lombardi v. Whitman*, the Court of Appeals for the Second Circuit affirmed the dismissal of a claim brought by five emergency responders to the World Trade Center site in the aftermath of the September 11th terrorist attacks who suffered or feared respiratory damage.⁹⁰ The workers, individually and as representatives of a class of individuals similarly situated, alleged that various federal public officials⁹¹ violated their right to substantive due process by issuing reassuring—and knowingly false—announcements about the air quality at the site, causing them to believe it was safe to work without sufficient protective respiratory equipment.⁹² However, guided by the Supreme Court's decision in

84. *Id.*

85. *Id.*

86. 42 U.S.C. section 9607(a)(4)(A)-(B).

87. 127 S. Ct. at 2332-33.

88. *Id.* at 2336.

89. *Id.*

90. 485 F.3d 73 (2nd Cir. 2007). The also brought suit "on behalf of a purported class including all those who worked at or in the immediate vicinity of the site during the period September 11, 2001, to October 31, 2001, who did so without sufficient respiratory equipment in reliance on information supplied by government officials, and who as a result suffer or reasonably fear suffering illness or injury from their exposure to asbestos or other harmful substances." *Id.* at 74.

91. Current or former officials of the Environmental Protection Agency, the White House Council on Environmental Quality, and the Occupational Safety and Health Administration.

92. 485 F.3d at 74. Both the report and the 33 press releases relied on by the plain-

Collins v. City of Harker Heights, the Second Circuit held that the allegations were not “egregious, conscience-shocking, and ‘arbitrary in the constitutional sense’” even if the public officials truly acted with deliberate indifference.⁹³

“[T]o shock the conscience and trigger a violation of substantive due process,” the Second Circuit explained, the “official conduct must be . . . truly ‘brutal and offensive to human dignity’”⁹⁴ Where there are no harmless options available, “an attempt to choose the least of evils is not itself shocking.”⁹⁵ In *Lombardi*, the appellate court found that the events of September 11th forced public officials “to make decisions using rapidly changing information about the ramifications of unprecedented events in coordination with multiple federal agencies and local agencies and governments.”⁹⁶ Assuming, nonetheless, that public officials made decisions in an unhurried fashion, the Second Circuit held that they were justified because the officials were subjected to the “pull of competing obligations” by having to inform the public about environmental dangers while simultaneously maintaining peace and order.⁹⁷

Digrugilliers v. Consolidated City of Indianapolis,
506 F.3d 612, 2007 WL 3151201 (7th Cir. 2007)

In *Digrugilliers v. Consolidated City of Indianapolis*, the Court of Appeals for the Seventh Circuit held that a church is entitled to a preliminary injunction pending the resolution of its claim that Indianapolis’ requirement that it obtain a variance to operate in a commercial office-buffer district (C-1) violates the Religious Land Use and Institutionalized Persons Act of 2000 (RLUIPA).⁹⁸ The pastor of a small congregation alleged that Indianapolis’ zoning ordinance offended RLUIPA which prohibits “impos[ing] or implement[ing] a land use regulation in a manner that . . . treats a religious assembly or institution on less than equal terms with a non-religious assembly or institution.”⁹⁹ The ordinance provided that C-1 districts were intended to be buffers between residential dis-

tiffs are available at <http://www.epa.gov/oig/reports/2003/wtc/toc.htm> (last visited November 11, 2007).

93. 485 F.3d at 84-85 (citing *Collins*, 503 U.S. 115, 125-29 (1992)).

94. *Id.* at 81 (citing *Smith v. Half Hollow Hills Cent. School Dist.*, 298 F.3d 168, 173 (2d Cir.2002)).

95. *Id.*

96. *Id.*

97. *Id.* at 83.

98. Religious Land Use and Institutionalized Persons Act of 2000, Pub. L. No. 106-274, 114 Stat. 803, 804 (codified at 42 U.S.C. § 2000cc *et seq.* (2001)).

99. 506 F.3d 612, *1, 2007 WL 3151201 (7th Cir. 2007)

tricts and commercial, or industrial, districts.¹⁰⁰ Yet, the code permitted several land uses in C-1 districts without requiring a variance, such as assisted-living facilities, community centers, day-care centers, nursing homes, funeral homes, art galleries, civic clubs and libraries.¹⁰¹

The district court found that to allow religious uses in C-1 districts without a variance would give churches greater rights than secular users because the zoning code defines a religious use to include residential uses¹⁰² which are not permitted in districts zoned C-1.¹⁰³ However, the Seventh Circuit rejected the lower court's analysis asserting that "[t]here is no indication that the plaintiff lives or intends to live, or that anyone else lives, in the building [because] the lease does not permit the property to be used as a residence."¹⁰⁴ More importantly, RLUIPA forbids local governments from "excluding churches from districts [on the basis of] super-added rights" when the government itself "defin[ed] 'religious use' so expansively as to bestow on churches in districts in which it allows them to operate more rights than identical secular users of land have."¹⁰⁵

The Seventh Circuit was not convinced by Indianapolis' other contention that the church could relocate to a Special Use district (SU-1) which does not require a variance for religious uses.¹⁰⁶ The record did not demonstrate that the City's discrimination against churches in C-1 districts was offset by the creation of a privileged zone for religious uses in SU-1 districts.¹⁰⁷ The court remarked that "[t]he existence of alternative sites for a church is relevant *only* when a zoning ordinance is challenged as imposing a "substantial burden" on religious uses of land."¹⁰⁸

Addressing the district court's last reason for its decision, the Seventh Circuit made it clear that it was not overly concerned that allowing a church to locate in a C-1 district would interfere with other land uses. It stated that "[g]overnment cannot, by granting churches special privileges, furnish the premise for excluding

100. *Id.*

101. *Id.*

102. For example, a rectory for the minister of the church. *Id.* at *2

103. *Id.* at *1.

104. *Id.* at *2.

105. *Id.*

106. *Id.*

107. *Id.* ("[T]here is nothing in the record about the price, ownership, topography, or location of these parcels. Maybe the reason there are no structures on them is that their location or something else about them makes them unsuitable for buildings in general or a church building in particular.").

108. *Id.* (emphasis provided).

churches from otherwise suitable districts.”¹⁰⁹ Since the church’s allegation that the City was violating RLUIPA had at least some and possibly great merit, the Seventh Circuit found that it was an error for the district court to deny the church a temporary injunction.¹¹⁰

United States v. Robison,
505 F.3d 1208, 2007 WL 3087419 (11th Cir. 2007)

In *United States v. Robison*, the Court of Appeals for the Eleventh Circuit grappled with fundamental aspects of the CWA,¹¹¹ specifically its jurisdiction and permitting powers under section 404.¹¹² After the defendants were convicted for their roles in a CWA conspiracy and found guilty of substantive violations of the Act, the United States Supreme Court addressed the definition of “navigable waters” under the CWA in *Rapanos v. United States*.¹¹³ The parties agreed that the standard for the definition of “navigable waters” was a key element of the CWA criminal offenses.¹¹⁴

Based on the Eleventh Circuit’s ruling in *United States v. Eidson*,¹¹⁵ the district court charged the jury that “navigable waters” included “any stream which may eventually flow into a navigable stream or river,” and that such stream may be man-made and flow “only intermittently.”¹¹⁶ The defendants argued that *Rapanos* demonstrated that the trial court erroneously instructed the jury as to the definition of the term “navigable waters” and that under a correct interpretation, Avondale Creek, the hydrological system at issue, would not be subject to the CWA’s governance.¹¹⁷ The government responded that Avondale Creek’s connection with the Black Warrior River and/or Village Creek renders Avondale Creek a “navigable water” within the meaning of the CWA.”¹¹⁸

At the outset of review, the Eleventh Circuit noted that the Supreme Court recently rejected *Eidson*’s “expansive definition” of “tributaries” in a 4-1-4 split decision *Rapanos* and therefore it must evaluate whether the district court’s “navigable waters” in-

109. *Id.*

110. *Id.*

111. Clean Water Act of 1977, Pub. L. No. 95-217, 91 Stat. 1566 (1977) (codified at 33 U.S.C. §§ 1281(a) 1294 97 (2006)).

112. 2007 WL 3087419 (11th Cir. 2007).

113. 126 S.Ct. 2208 (2006). The CWA generally prohibits the discharge of pollutants into “navigable waters.” See 33 U.S.C. §§ 1311(a), 1362(12)

114. See 2007 WL3087419.

115. 108 F.3d 1336 (11th Cir. 1997).

116. *Id.*

117. See 2007 WL3087419.

118. *Id.* at *5.

struction was erroneous.¹¹⁹ Under the CWA, “navigable waters” are defined as “the waters of the United States, including the territorial seas.”¹²⁰ However, the Court failed to articulate a standard for the definition when presented the opportunity to do so in *Rapanos*.

Justice Scalia’s plurality opinion attempted to construct a two-prong test to determine whether water is “navigable” and thus subject to CWA jurisdiction: “First, that the adjacent channel [to the wetland] contains ‘a water of the United States,’ . . . and second, that the wetland has a continuous surface connection with that water, making it difficult to determine where the ‘water’ ends and the ‘wetland’ begins.”¹²¹ Conversely, Justice Kennedy’s concurrence endeavored to establish a “significant nexus” test. Under this inquiry test, a water is “navigable” only if it possesses a significant nexus to waters that “are or were navigable in fact or that could reasonably be so made.”¹²² In evaluating an upstream waterway or water feature to ascertain whether such a nexus exists, the chemical, physical or biological effect upon a downstream navigable-in-fact waterway must be considered.¹²³ Finally, Justice Stevens’ dissent stipulated that meeting either Justice Scalia’s plurality test or Justice Kennedy’s “significant nexus” test would prove jurisdiction.¹²⁴

In an effort to utilize the correct framework, the Eleventh Circuit turned to the Supreme Court’s decision in *Marks v. United States*¹²⁵ for guidance. *Marks* provides that “[w]hen a fragmented [Supreme] Court decides a case and no single rationale explaining the result enjoys the assent of five Justices, the holding of the Court may be viewed as that position taken by those Members who concurred in judgments on the narrowest grounds.”¹²⁶ Finding that Justice Kennedy’s opinion was the “narrowest view of the Justices who concurred in the judgment” the appellate court adopted the “significant nexus” test.¹²⁷ The district court’s instruction to the jury was therefore erroneous because it “did not mention the phrase ‘significant nexus’” or otherwise satisfy the test, but merely stated that “[a]n intermittent flow into a navigable-in-fact body of water would be sufficient to bring Avondale Creek within the

119. *Id.*

120. 2007 WL 3087419 at *1 (citing 33 U.S.C. § 1362(7)).

121. *Id.* at *7 (citing *Rapanos*, 126 S.Ct. at 2227 (Scalia, J., plurality)).

122. *Id.* at *8 (citing *Rapanos*, 126 S.Ct. at 2236 (Kennedy, J., concurring)).

123. *See id.*

124. *Id.* at *9 (citing *Rapanos*, 126 S.Ct. at 2252 (Stevens, J., dissenting)).

125. 430 U.S. 188, 193 (1997).

126. *Id.* (citations omitted).

127. *See* 2007 WL 308749 at *14.

reach of the CWA”¹²⁸ Finally, because the government did not meet its burden of establishing harmless error, the Eleventh Circuit remanded for a new trial.¹²⁹

III. FLORIDA CASE LAW

Neumont v. State, --- So.2d ----, 2007 WL 2790764 (Fla. 2007)

In *Neumont v. State*, property owners brought a class action alleging that Monroe County’s ordinance restricting the use of property in residential districts as vacation rentals¹³⁰ violated their legal right to participate in the lawmaking process.¹³¹ The County first put the public on notice of a hearing regarding the proposed ordinance in an advertisement entitled “Modifying the existing prohibition on tourist housing including vacation rentals in all land use districts.”¹³² After receiving feedback at the hearing, the draft ordinance was modified.¹³³ The County’s second advertisement placing the public on notice of another public hearing differed slightly and read “Modifying the existing prohibition on tourist housing including vacation rentals in all *residential districts*” (as opposed to “land use districts”).¹³⁴ At the second hearing, the board considered another version of the ordinance and an “Errata Sheet,” which included more revisions to the proposal.¹³⁵ After the meeting, the board approved the rectified ordinance which incorporated the suggested modifications in the errata sheet.¹³⁶

The petitioners owned property in the County, which they previously used for short-term vacation rentals.¹³⁷ They brought an action against the County in federal court challenging the ordinance based on state and federal law alleging, among other claims, that the ordinance was unlawful pursuant to section 125.66(4)(b), Florida Statutes (2006), “because the changes made during the enactment process where ‘substantial or material,’ thereby requiring the process to begin anew.”¹³⁸ The County conceded that a “sub-

128. *Id.* at *12

129. *Id.* at *14.

130. The ordinance defined vacation rentals as rentals of fewer than twenty-nine days.

131. 2007 WL 2790764 (Fla. 2007).

132. *Id.* at *1.

133. *Id.*

134. *Id.* (emphasis in original).

135. *Id.*

136. *Id.* at *2.

137. *Id.*

138. *Id.* Section 125.66(4)(b), Florida Statutes, (2006), governs the enactment procedure of county ordinances.

stantial or material change” to a draft ordinance would require additional notice and public hearings,¹³⁹ but argued that the modifications to this ordinance were not substantial or material because the purpose of the ordinance remained the same.¹⁴⁰ The district court upheld the ordinance and the petitioning property owners appealed. Recognizing that if the ordinance is void under state law, there would be no need to resolve the questions of federal law,¹⁴¹ the Eleventh Circuit certified the following question to the Florida Supreme Court:

Whether, for the purposes of Florida Statutes section 125.66(4)(b), a “substantial or material change” in a proposed ordinance during the enactment process (that is, the kind of change that would require a county to start the process over) is confined to a change in the “original general purpose” of the proposed ordinance, or whether a substantial or material change includes (1) a change to the “actual list of permitted, conditional, or prohibited uses within a zoning category,” or (2) a change necessary to secure legislative passage of the ordinance?¹⁴²

The Florida Supreme Court evaluated three possible definitions of “substantial or material change” proposed by the parties: “a change to the actual list of permitted, conditional, or prohibited uses within a zoning category; a change necessary to secure legislative passage; and a change in the original purpose of the ordinance.”¹⁴³ In a unanimous decision, the court ruled in favor of the latter interpretation reasoning that it effectively balances providing the public with adequate notice and permitting the efficient modification of proposed ordinances in response to public input.¹⁴⁴ The court then found that “even if the enactment procedures had begun anew, the public would not have received meaningful notice of the changes because none of them rendered the [advertised] title

139. See Att’y Gen. Fla. 82-93 (1982) (“[I]f any *substantial or material changes* or amendments are made during the adoption process, the enactment process. . . must start anew, with full compliance with the reading and notice requirements contained [in the statute].”) (emphasis added).

140. See 2007 WL 2790764 at *2.

141. Federal courts “address questions of federal constitutional law only as a last resort.” *Neumont v. Florida*, 451 F.3d 1284, 1285 (11th Cir. 2006) (quoting *Save Our Dunes v. Ala. Dep’t of Entl. Mgmt.*, 834 F.2d 984, 989 (11th Cir. 1987)).

142. See 2007 WL 2790764 at *2.

143. *Id.* at *3.

144. *Id.* at *8-9.

inaccurate.”¹⁴⁵ Thus, the change in title for the zoning ordinance that prohibited vacation rentals in residential land use districts was not substantial or material.”¹⁴⁶ Having answered the certified question—fundamentally stream-lining the local government’s ability to pass and amend laws—the case was returned to the Eleventh Circuit.¹⁴⁷

Lee v. CSX Transp., Inc., 958 So.2d 578 (Fla. 2nd DCA 2007)

In *Lee v. CSX Transp., Inc.*, the Florida Second District Court of Appeal held that the state accrual date for wrongful death actions was not preempted by CERCLA.¹⁴⁸ Four years after the decedent’s death, a personal representative brought an action against the owner of a coal tar creosote plant, alleging that decedent’s fatal cancer was caused by toxic environmental contamination released by the plant.¹⁴⁹ The circuit court granted the defendant’s motion for summary judgment concluding that the undisputed facts established that the action “was untimely filed” under Florida’s Wrongful Death Act which establishes a two-year limitations period.¹⁵⁰

The petitioner argued, however, that the Florida law with respect to the accrual of the wrongful death action was preempted by CERCLA, which modifies the accrual date with respect to actions for personal injury caused by hazardous substances.¹⁵¹ CERCLA establishes a federally required commencement date (FRCD) which preempts any earlier accrual date applicable under state law.¹⁵² The FRCD is “the date the plaintiff knew (or reasonably should have known) that the personal injury . . . [was] caused or contributed to by the hazardous substance or pollutant or contaminant concerned.”¹⁵³ Moreover, the FRCD may be applied to an action “brought under State law for personal injury . . . which [is] caused or contributed to by exposure to any hazardous substance, or pollutant or contaminant, released into the environment from a facility.”¹⁵⁴

After evaluating the statute’s text in light of context, structure,

145. *Id.* at *9.

146. *Id.*

147. *Id.*

148. 958 So. 2d 578 (Fla. 2d DCA 2007); 42 U.S.C. § 9658 (1994).

149. 958 So. 2d at 579.

150. *Id.*; § 95.11(4)(d), FLA. STAT. (1995).

151. 958 So. 2d at 580.

152. 42 U.S.C. § 9658 (1994).

153. 958 So. 2d at 580.

154. *Id.* (emphasis in original).

and related statutory provisions, the Second District held that CERCLA does not support a broad interpretation of “personal injury” which would encompass actions for wrongful death.”¹⁵⁵ To the contrary, Congress selected “a term of art—a term with a well-established meaning in the law and common understanding—that does not include wrongful death claims within the scope of the FRCD.”¹⁵⁶ Because a wrongful death claim does not fall within the scope of the FRCD contained in CERCLA, the circuit court’s decision was affirmed.¹⁵⁷

Trepanier v. County of Volusia, 965 So.2d 276 (Fla. 5th DCA 2007)

In *Trepanier v. County of Volusia*, the Florida Fifth District Court of Appeal considered a claim brought by individuals to exclude public parking on beach property in which they possessed a fee ownership.¹⁵⁸ The petitioners alleged that Volusia County improperly utilized the property for traffic and parking without a legal right to do so.¹⁵⁹ The record established that hurricanes in 1999 and 2004 heavily eroded the property in question,¹⁶⁰ shifting the mean high water line substantially inland and bringing the beach closer to petitioners’ land.¹⁶¹ The County consequently moved public parking and driving lanes onto a portion of the beach owned by the petitioners.¹⁶² In response, the petitioners filed a multiple count suit against the County seeking to enforce their property rights.¹⁶³ The inverse condemnation claims alleged that both the appropriation of their property for parking and driving lanes, as well as the installation of marker posts, were takings that required compensation.¹⁶⁴ The trespass claim was brought based on the County’s maintenance of the parking and driving lanes.¹⁶⁵ Petitioners also requested declaratory relief establishing the right to exclude the public’s use of their property for vehicular traffic and parking and injunctive relief prohibiting the public from using their property for such purposes.¹⁶⁶

The trial court denied summary judgment to the property own-

155. 958 So. 2d at 582.

156. *Id.*

157. *Id.* at 584.

158. 965 So. 2d at 278-80.

159. *Id.* at 279.

160. *Id.* at 278-79.

161. *Id.* at n.1.

162. *Id.* at 279.

163. *Id.*

164. *Id.*

165. *Id.* The court found no error in dismissing this trespass claim. 965 So. 2d at n.4.

166. 965 So.2d at 279-80.

ers and granted partial summary judgment to the County.¹⁶⁷ In doing so, it determined that several property theories permitted the public to access and use the property.¹⁶⁸ The Fifth District acknowledged the complexity of these issues¹⁶⁹ stating that the Florida Supreme Court would ultimately need to determine some of them.¹⁷⁰ It nevertheless addressed three potential sources of public right to the beach that had been relied on by the trial court: prescriptive easement, dedication and custom.¹⁷¹

The Fifth District reversed the trial court's summary judgment on prescriptive easement grounds holding that there were issues of material fact that must be determined.¹⁷² It also found that the trial court erred in its finding that the lots were dedicated to public use.¹⁷³ The court next painstakingly evaluated custom as a potential source of public right because the case raised a number of issues that had not been address before in Florida, specifically implications of the Florida Supreme Court's decision in *City of Daytona Beach v. Tona-Rama, Inc.*¹⁷⁴

The court looked at three specific questions in relation to custom. First, it decided that *Tona-Rama* did not necessarily establish a customary interest in this piece of beach.¹⁷⁵ Second, it analyzed several conflicting theories of custom and determined that there was not sufficient evidence in the record to determine that there was customary right to drive on this portion of the beach.¹⁷⁶ The court found that:

Driving and parking on the beach may be considered an adjunct to the recreational use of the beach because it is the way to access the beach; it may be viewed as a customary use in its own right based on either a historic custom of using the beach as a thoroughfare; or it may itself be deemed a recreation.¹⁷⁷

It concluded that whether a customary right of public access to this portion of the beach was ambulatory is a matter

167. *Id.*

168. *Id.*

169. *Id.* at 280.

170. *Id.* at n. 21.

171. *Id.* at 284.

172. *Id.* at 284-85.

173. *Id.* at 285-86.

174. *Id.* at 286-87; *City of Daytona Beach v. Tona-Rama, Inc.*, 294 So. 2d 73 (Fla. 1974).

175. 965 So. 2d at 287-89.

176. *Id.* at 289-91.

177. *Id.* at 291.

of proof that must be decided by the lower court.¹⁷⁸ While the procedural posture allowed the court to avoid many of the issues, this case is likely to be seen on appeal and may decide several significant questions regarding coastal property.¹⁷⁹

IV. NOTABLE BILLS FROM FLORIDA'S 2007 LEGISLATIVE SESSION¹⁸⁰

HB 1375 Relating to Affordable Housing

HB 1375 necessitates that a local comprehensive plan housing element designate adequate sites for workforce housing.¹⁸¹ By July 1, 2008, each county, with a disparity between the buying power of a family of four and the median home sales price that exceeds \$170,000, must acquiesce to a plan ensuring affordable workforce housing unless the county is designated as an area of critical state concern. "Affordable workforce housing" is defined by the legislature as "housing that is affordable to a person who earns less than 120 percent of the area median income, or less than 140 percent of the area median income if located in a county in which the median purchase price for a single-family existing home exceeds the statewide median purchase price of a single-family existing home."¹⁸² Failure to adopt an affordable workforce housing plan will render the local government ineligible to receive state housing assistance grants.

Additionally, affordable housing units in close proximity to employment centers are exempt from transportation concurrency requirements under HB 1375 if certain criteria are met.¹⁸³ Local governments and developers of affordable workforce housing may identify employment centers with at least 25 full-time employees located within five miles of the nearest point of a development of regional impact. If at least half of the units are occupied by employees, then all the affordable workforce housing units are exempt from transportation concurrency requirements.

Recognizing the down turn in the Florida real estate market,

178. *Id.* at 289-91.

179. *Id.* at 278.

180. This segment is largely based on legislative summary from the Environmental and Land Use Section of the Florida Bar and the Senate Committee on Environmental Preservation. See Eric T. Olsen and Jennifer Fitzwater, *2007 Legislative Session Summary*, available at http://www.eluls.org/2007/Reporter_July%202007/July07_legislative_session.html [hereinafter Olsen].

181. H.R. 1375, 2007 Leg., Sess. (Fl. 2007).

182. Fla. Stat. 380.0651(3)(j) (2007).

183. See Olsen, *supra* note 180.

the legislation also extends all phase, buildout, and expiration dates for projects that are developments of regional impact and under construction on July 1, 2007, for three years.¹⁸⁴ The extension is not a substantial deviation, not subject to further review and must not be considered when determining if a subsequent extension is a substantial deviation. HB 1375 further exempts from substantial deviation review development changes that permit the sale of an affordable housing unit to a person who earns less than 120% of the area median income as long as the developer actively markets the unit as such for at least six months.¹⁸⁵

The measure states that local governments may expedite consideration of such plan amendments once they have determined, within a comprehensive plan, the types of housing development and conditions that are consistent with local housing incentive strategies.¹⁸⁶ The bill sets forth requirements to consider these amendments, obligating local governments to hold only one public hearing which is the plan amendment adoption hearing. Moreover, an affordable housing tax deferral program is created by authorizing local governments to adopt ordinances allowing for the deferral of ad valorem taxes and non-ad valorem assessments if the property owners are engaging in the operation, rehabilitation or renovation of affordable rental housing property.

HB 1375 also revises and clarifies the responsibilities of the Florida Housing Finance Corporation (FHFC). Notably, the enactment provides that the FHFC may require that an agreement be recorded in the public records mandating that the project be used for affordable housing for persons that meet specific income criteria.¹⁸⁷ The FHFC is authorized by HB 1375 to forgive a share of a loan to a nonprofit organization if the loan is from funds allocated for sponsors of housing for the elderly to make building preservation, health or sanitation, life-safety or security related repairs or improvements. The FHFC is granted authority to create a loan application process for the Community Workforce Housing Innovation Pilot Program.

CS/SB 1472 Relating to Beaches and Shore Preservation

CS/SB 1472 modifies Florida's beach management program in several regards. First, the definition of "access" or "public access" is expanded to include established accessways that are to be retained

184. *Id.*

185. *Id.*

186. *Id.*

187. *Id.*

for public use, unless a comparable alternative accessway is provided.¹⁸⁸ Second, provisions governing the issuance of dune restoration permits by the Department of Environmental Protection for projects that incorporate geotextile containers or similar structures are amended.¹⁸⁹ Third, the legislation includes specific requirements governing the installation of these structures, including siting, engineering, legal and financial requirements as well as a provision for the removal of failed containers. Fourth, methods are provided for valuing impacts to upland owners in conjunction with a beach restoration project. Finally, the Department of Environmental Protection is required to develop a sand source inventory of offshore sand sources. County commissions in coastal counties must be notified when a renourishment project proposes to use adjacent sand sources outside of the region.

SB 2770 Relating to Comprehensive Everglades Restoration Plan

SB 2770 is a memorial from the Florida Legislature imploring the United States Congress to fully authorize funding for the Comprehensive Everglades Restoration Plan (CERP) as approved in the Water Resources Development Act of 2000.¹⁹⁰ “SB 2770 states that the Everglades is one of the most unique and fragile ecosystems in the world which is recognized as imperiled and must be restored. . . [s]ince 2000, the Florida Legislature and the South Florida Water Management District have appropriated more than \$2 billion to implement CERP, which accounts for more than 90% of the total funding.”¹⁹¹ Furthermore, “the Water Resource Development Act of 2000 approved CERP as a full and equal partnership” between the Florida and the federal government.¹⁹² Finally, SB 2770 maintains that “the Indian River Lagoon, Picayne Strand, and ten conditionally approved projects also require funding authorization from Congress.”¹⁹³

SB 7173 Relating to Fish & Wildlife Conservation Commission

SB 7173 delineates the Fish and Wildlife Conservation Commission’s (“FWCC”) constitutional authority over marine life.¹⁹⁴ The bill determines that FWCC’s authority does not include areas

188. S. 1472, 2007 Leg., Sess. (Fla. 2007).

189. See Olsen, *supra* note 180.

190. S. 1472, 2007 Leg., Sess. (Fla. 2007).

191. See Olsen, *supra* note 180.

192. *Id.*

193. *Id.*

194. S. 7173, 2007 Leg., Sess. (Fla. 2007).

retained by the Legislature or vested in any other agency, other than the Marine Fisheries Commission, as of March 1, 1998. FWCC's governance similarly does not extend to marine aquaculture retained by the Legislature or vested in any other agency as of July 1, 1999. Furthermore, the FWCC must adopt adequate due process procedures by rule which are published in the Florida Administrative Code.

The bill allows up to ten percent of fees deposited in the Save the Manatee Trust Fund, the Florida Panther Research and Management Trust Fund and the State Game Trust fund to be used to promote or market manatee, Florida panther and largemouth bass specialty license plates. Certain proceeds collected under the Marine Resources Conservation Trust Fund are to fund the stone crab trap reduction program, the blue crab effort management program, the spiny lobster trap certificate program and the derelict trap retrieval program. Additionally, the enactment mandates legislative approval for certain commission rules that establish equitable rent.

The Blue Crab Effort Management Program which establishes funding fee schedules, administrative penalty limits, license suspension and revocation requirements and third-degree felony penalties is created by SB 7173. Pursuant to the bill, the FWCC may temporarily waive the trap tag fees for stone crab, blue crab and spiny lobster fisheries in areas that are declared to be a disaster emergency area by the governor where massive trap losses occur.

SB 7173 requires the assessment of administrative penalties and eradicates the suspension of endorsement provision in the stone crab and spiny lobster programs for first-time rule violations. The bill also authorizes the FWCC to use trap retrieval fees to recover blue crab traps and black sea bass traps. Lastly, the legislation moderately increases several license and permit fees for residential and non-residential freshwater and saltwater fishing and hunting as well as offers nonresidents a three-day freshwater fishing license.¹⁹⁵

195. See Olsen, *supra* note 180.

BOOK REVIEW

THE WAY WE LIVE

DAVID L. POWELL*

Witold Rybczynski, *Last Harvest*, 309 pages (Scribner 2007)

Over the years, the architect and author Witold Rybczynski has written a number of books to explain how we live in America today and to recount the sometimes-hidden history of our built environment: *City Life*, a history of urban development in America; *Home: The Short History of an Idea*, about cultural notions of domestic comfort; *A Clearing in the Distance*, the life of Frederick Law Olmstead and his nineteenth century achievements in urban landscape architecture; and others. Rybczynski now gives us *Last Harvest*, a tale that, while not exactly a page-turner, has many of the elements of a good thriller. There is high-minded idealism and a touch of calculated lawlessness, collegial collaboration and hard-nosed determination, clockwork efficiency and sloth-like bureaucracy, and the public interest and private gain.

It is, in short, the story of a real estate development in modern America, from its inception by a developer to move-in by the first home buyers. For the uninitiated, it will take much of the mystery out of the land development business. It is a practical examination of how and why we live as we do in much of America, and how and why some developers, planners, and government officials are trying to do better.

Rybczynski, a professor at the University of Pennsylvania, chose as his subject the 125-lot subdivision of New Daleville in Londonderry Township, Chester County, Pennsylvania. By many standards, New Daleville is relatively small, and yet Rybczynski's story is not. The arc of his narrative crosses almost five years, from project planning, to regulatory review, to negotiations with lenders, to haggling with homebuilders, to marketing the community, to finishing the punch list on the first buyer's home. Through it all, Rybczynski skillfully weaves together the public aspects of his story with a behind-the-curtains look at the myriad of economic and political forces which the developer must manage as he tries to create a new community on ninety acres of Pennsylvania farm-

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land.

That focus on the practical aspects of creating New Daleville is one of the features of *Last Harvest* that distinguishes it in the growing catalog of books about the new urbanism. In the last twenty-five years, we have seen a proliferation of books decrying how “we continue to build – and live in – vast tracts of undifferentiated development that form neither neighborhoods, towns, or cities.”¹ Typically, these books argue for a better way of designing communities so they more closely resemble neighborhoods that, in many cases, pre-date the Automobile Age. The more insistent of these commentators delve into minutiae on everything from the Standard State Zoning Enabling Act to the AASHTO “Green Book”, from Federal Housing Administration and Veterans Administration home loan programs to the turning radii of modern fire trucks.

Make no mistake: these books have made a valuable contribution to the public discourse on development in this country through their dissection of the many technical factors that influence development patterns, but they too rarely focus on the real people who are in the trenches, struggling over the creation of a new development in a complex political and regulatory process, and the real world of homebuilders and home-buyers. Rybczynski’s book provides that human context.

The whole cast of characters typically involved in a new development walks through the pages of this book. There is the land seller who wants to cash out part of the family farm on the “frontier” of Chester County.² There is the town planner devoted to new urbanism as a better way to design communities than the typical, post-World War II subdivisions. There are go-slow local officials who want to micro-manage the project down to the details of individual houses, fearing that New Daleville will be one more wretched development that scars the countryside. There is the project manager who handles a thousand details and keeps a running total of cost and revenue projections on his *pro formas* to make sure the project pencils out. There are nationally prominent architectural consultants who try to give New Daleville design guidelines that reflect the local architectural vernacular. There is the national production homebuilder who buys lots in New Daleville, and then, disregarding the local architectural vernacular, seeks to preserve the economic efficiencies of its operation by using

1. Alex Krieger, *Since (and Before) Seaside*, in ANDRES DUANY & ELIZABETH PLATER ZYBERK: *TOWNS AND TOWN-MAKING PRINCIPLES* 9, 9 (Alex Krieger & William Lennertz eds., 1991).

2. WITOLD RYBCZYNSKI, *LAST HARVEST* 235 (2007).

the standard housing models it builds from South Carolina to New England. Finally, there are the neighbors who moved to the urban fringe because they wanted large-lot, residential neighborhoods and feared the small-lot, new urbanist design of New Daleville.

The protagonist of *Last Harvest* is Joe Duckworth, a principal in the Arcadia Land Company. Duckworth, Robert S. Davis, and Christopher B. Leinberger created Arcadia as a vehicle to undertake new urbanist developments like the one that Davis popularized in the 1980s at Seaside, his trail-blazing coastal resort in northwest Florida's Walton County. For all the people who figure into Rybczynski's narrative, this is Duckworth's story, and Rybczynski sums up his role very well: "Developers tread a delicate path. They are agents of change, operating between the regulations – and desires – of local jurisdictions and the demands of the marketplace, and they must satisfy both. That isn't always easy, and it's rarely popular."³ Like all good developers, one measure of Duckworth's success is that, by the end of the process, so many stakeholders are invested in making his vision become reality that his own role is "largely invisible."⁴

Rybczynski gives us an inside look at the land development process, which Duckworth aptly describes with some oversimplification as "spending money buying and subdividing land, and making money selling the lots."⁵ The author depicts the iterative planning process for the new community, with the changes, refinements, and compromises that take place at every turn. He also shows some of the techniques that the savvy developer uses to persuade the community to buy into his vision. Anyone who has shepherded a development project through the public process will nod in recognition at Rybczynski's accounts of the seemingly endless hearings, the obstinate neighbors, and the indecisive politicians that Duckworth and his colleagues must overcome.

Rybczynski shifts back and forth adeptly between the seemingly small story about New Daleville and the larger story of how we create new communities in America. The backdrop of his narrative sweeps from the colonial land schemes that enriched speculators like George Washington to Robert Davis' creation of Seaside, the story of which is now almost as much a part of American lore as Lana Turner being discovered at Schwab's Drugstore on Sunset Boulevard. The supporting cast of the backdrop is generously sprinkled with thinkers and doers—Lewis Mumford and Charles

3. *Id.* at 280.

4. *Id.* at 263.

5. *Id.* at 187.

Fraser, Le Corbusier and William Penn, Andres Duany and Elizabeth Plater-Zyberk, John Nolen and Frank Lloyd Wright.

Rybczynski does not argue arcane issues of urban design. Nowhere in this book will you catch him engaging in the polemics that so often characterize works by devotees of the new urbanism. Rybczynski lets his characters make the case for a new way of organizing American communities. He leavens those arguments with real-world considerations like the professional skepticism of developers and lenders, the deep-seated wishes of home buyers who see a large lot detached home as their rightful share of the American Dream, and the vagaries of the cyclical real estate market. Rybczynski is so passive that he does not even acknowledge the irony that the first home buyers who end his book purchased a lot on that bane of new urbanists, a cul-de-sac.

The regulatory process through which Arcadia must travel to win governmental approval for New Daleville is quite a bit different from the Florida experience. There is no local government comprehensive plan to provide a “constitution” for the land use decisions of Londonderry Township,⁶ so there is both more latitude for the decision makers to act arbitrarily and less certainty for everyone. Nor is there review by a state land planning agency to ensure that the development pattern for New Daleville complies with state-imposed norms.⁷ Yet many steps in the regulatory review of New Daleville are similar to what is experienced in Florida every time a proposed development goes through the official process.⁸ For example, New Daleville and Florida share the unexpected adversity of a real estate market caught in a slump, a phenomenon that Rybczynski describes in terms befitting a force of nature.⁹ Also similar are the attitudes of the various stakeholders, all too well reflecting the Florida experience.

Perhaps most disconcerting is the skepticism and resistance to new urbanist planning principles that Rybczynski documents in

6. *Machado v. Musgrove*, 519 So. 2d 629, 632 (Fla. 3d DCA 1987). The *Machado* court provided one of the better judicial discussions on the distinction between a comprehensive plan as the legislative policy basis for controlling land use and zoning as an implementation measure that “involves the exercise of discretionary powers within limits imposed by the plan.” *Id.*

7. See FLA. STAT. § 163.3184 (2007).

8. Rybczynski refers to Florida in a number of contexts – as birthplace of the new urbanism at the panhandle resort of Seaside, Rybczynski, *supra* note 2, at 17-23; as the setting for Disney’s Celebration, which popularized these planning principles in the context of a primary residential community, *id.* at 21; and as one of the few states with a state-directed land use regulatory system. *Id.* at 32. For some Florida practitioners, his only false note about the state will be his characterization of Florida as one of the few states to “embrace development.” *Id.* at 51. While that attitude may prevail in some parts of Florida, the days are long past when it holds true everywhere in this diverse state.

9. See *id.* at 225-32.

Londonderry Township. There is a growing body of evidence that multi-use developments with smaller lots, interconnected streets, varied types of housing, and walk-to shopping and employment opportunities represent a development pattern with fewer environmental and public facility impacts coupled with a greater sense of community for residents. And yet the township's decision makers have a hard time embracing this vision by simply amending their zoning code to include a Traditional Neighborhood Development ordinance. Rybczynski describes their epiphany coming when they are finally nudged into doing the right thing by someone in the audience telling them: "We've been doing conventional development and we hate it . . . Why don't we try something new, and if we don't like it we won't do it anymore."¹⁰

If the decision makers' reluctance to embrace new urbanism planning principles is disconcerting, so is the resistance of neighbors and home buyers. Rybczynski explains that "[s]ingle-use zoning has proved to be notably unsuccessful in organizing the environment, since it does not address the three-dimensional nature of our physical surroundings and instead reduces everything to a crude technical measure. No wonder the popular idea of planning is simplistic: high density bad, low density good."¹¹ Home buyers are no more immune to this fallacious reasoning than the neighbors, as Rybczynski makes clear when he discusses the consumer desires that motivate New Daleville's buyers: "Despite the sensible arguments in favor of small lots, narrow streets, walkability, and density, buying a house is not, for most people, about ideology."¹²

On the other hand, while Rybczynski documents the resistance to new development patterns, it is impossible to read *Last Harvest* without sensing the unhappiness that permeates officialdom and homeowners alike over the conventional development patterns that have shaped the places where so much of America lives. He presents the paradox very well: while we are largely dissatisfied with the built environment derived from post-World War II subdivisions, we are reluctant to plunge into the brave world of new urbanism.¹³ Addressing this paradox is the central challenge that confronts anyone who wants to see more liveable communities in modern America. Unfortunately, Rybczynski does not suggest a way out of this conundrum.

10. *Id.* at 63.

11. *Id.* at 40.

12. *Id.* at 260.

13. *See, e.g., id.* at 161-63 (contrasting the benefits and downsides of urban and suburban living).

Anyone steeped in the land use business will be disappointed with some aspects of *Last Harvest*, chiefly the parts of the story that are given short shrift. For example, Rybczynski does not tell the beginning-to-end story about the exactions that Duckworth must negotiate, and ultimately pay, for his project before he passes them along for eventual payment by end-users. Early in his narrative, Rybczynski discusses a looming dispute between the developer and the township over the cost of improvements to a park that Arcadia will dedicate at New Daleville. He writes that "Arcadia has no intention of covering the entire cost of a park," but he never tells us the resolution of the dispute over the park exaction.¹⁴ Similarly, he tells us about the township's demands for road improvements to address traffic congestion and even goes so far as to let us know that Pennsylvania's state road agency wants the township to press Arcadia for even more money. But, he does not tell us the resolution of that issue, which Florida practitioners will recognize as typically the biggest cost item for any land development in this state.

A more serious shortcoming is that Rybczynski focuses only on the residential component of New Daleville and ignores the separate but equally important commercial component. If there is one imperative of new urbanism that its proponents have pounded into the public consciousness over the years, it is that land developments in America should mix uses to achieve a greater efficiency in land use. Rybczynski tells us early in the narrative that the plan includes up to 12,500 square feet of non-residential development for retail or office uses like a convenience store or a professional office.¹⁵ Alas, we never hear what happens to this part of the project; the last time we hear about the commercial site is when Rybczynski tells us that two sales trailers have been located on it as the residential marketing effort ramps up.¹⁶

The apparent disappearance of the commercial part of New Daleville may reflect the economics of the developer's *pro forma* and the demands of retailers who want an adequate traffic count to justify a location, but it does not reflect the bedrock principles of new urbanism. In any event, Rybczynski does not tell us. Nor does Rybczynski address one of the more critical issues that a developer must keep in mind when mixing uses in a new develop-

14. *Id.* at 108.

15. *Id.* at 75.

16. As of this writing, the commercial component remains a mystery. Neither Arcadia Land Company's website nor the website for New Daleville mentions commercial development at New Daleville. See Arcadia Land Co., <http://www.arcadialand.com> (last visited Dec. 3, 2007); New Daleville, <http://www.newdaleville.com> (last visited Dec. 3, 2007).

ment, namely, that the market requires the rooftops to come before the commercial uses that will enable a homeowner to make one of the promised fifteen minute walks to buy that proverbial loaf of bread or carton of milk.

And yet there is much that is right about this book. Rybczynski's chapter on urban sprawl is a concise masterpiece. What it lacks in the technical nuances found in measures like the Florida Department of Community Affairs' urban sprawl rule¹⁷ is more than compensated for by its dispassionate, plain-language analysis. Part of the difficulty in dealing with sprawl, Rybczynski writes, "is that there is no widely agreed-upon definition."¹⁸ It is a landscape shaped by many social forces which result in a "state of perpetual upheaval" in much of America, he argues.¹⁹ "That's probably why sprawl has become a whipping boy for so many of the things we don't like about modern life: traffic jams, over-crowding, instability, change itself."²⁰

Rybczynski acknowledges the consumer desires of American home buyers who vote with their pocketbooks for large-lot subdivisions on the developing fringe despite the admonitions of thinkers, planners, environmentalists, and developers. He goes so far as to debunk the myths about sprawling developments on the fringe causing the decline of center cities and amounting to the injudicious use of land resources. "Environmentalists make sprawl sound like a voracious monster," he says.²¹ "Yet America is not running out of land."²² Rybczynski exhibits a refreshing sense of skepticism about the current planning fashion, "smart growth," which he describes as "a slippery concept, not least because it is

17. FLA. ADMIN. CODE ANN. r. 9J-5.006(5) (2003). Without the benefit of a fully developed set of facts, Florida practitioners will enjoy puzzling through the issue of how many of the thirteen primary indicators of urban sprawl identified in the Florida rule would be implicated by New Daleville. To this author, the project appears likely to be deemed urban sprawl under the rule.

18. Rybczynski, *supra* note 2, at 82.

The Florida urban sprawl rule takes the sensible position of prescribing a method of analysis for making professional judgments about whether a specific development pattern in a specific situation should be considered urban sprawl when the State determines whether a local comprehensive plan or plan amendment is "in compliance" for purposes of section 163.3184(1)(b), Florida Statutes. Prior to adoption of that rule in 1992, Florida courts accepted the working definition of urban sprawl as "the extension of urban-type development into rural, agricultural, or other undeveloped or sparsely developed lands in a haphazard development pattern in which land uses are not functionally related to each other." *Home Builders & Contractors Ass'n of Brevard, Inc. v. Dep't of Comty. Aff.*, 585 So. 2d 965, 968 (Fla. 1st DCA 1991). New Daleville would probably be deemed urban sprawl under this judicial definition as well.

19. Rybczynski, *supra* note 2, at 85.

20. *Id.*

21. *Id.* at 82.

22. *Id.*

espoused by anti-growth environmentalists as well as pro-growth developers,” each for their own reasons.²³ He buttresses these arguments by referring back to the classic mid-twentieth century sociological study by Herbert J. Gans, *The Levittowners*, which argued that suburban homeowners at Levittown, New Jersey, were happy despite the sneers of the elites because “Levittown is a good place to live.”²⁴

And what of New Daleville? What do we think of it? In many ways, it represents the trade-offs that are made everyday in every development, through the complex interaction of government officials, private developers and interested parties. “Since Londonderry has no real master plan, merely zoning districts, the development, however well-designed, will remain an isolated residential island,” he writes.²⁵ There is no real village center at New Daleville, and not enough density for public transportation, so residents will be automobile-dependent.²⁶ Nor is there affordable housing. Yet fifty-two of the ninety acres will be preserved as open space, and residents will have walkable neighborhoods. They stand a far better chance of knowing their neighbors than residents in the typical one-acre lot suburban tracts. And unlike other subdivisions in Londonderry Township, New Daleville is served by on-site central wastewater treatment rather than septic tanks. So it is incrementally better than most of what is being built there today. That is how change usually comes, at the margins.

In sum, Rybczynski has written an accessible and worldly account of how the American landscape is shaped into what many of us see each day during our morning and evening commutes. For anyone who wants a non-technical rendering of how we make new communities in America, written for a mass audience, this book covers the basics, and it provides a welcome window into that complex entrepreneurial process. It is a story populated throughout by well-intentioned people who are working within the American private economy, regulated by governmental agencies and mindful of the fears of neighbors who can always get a politician’s ear. The story is one of modest hope that what we create in the future will be better than what we created in the recent past.

23. *Id.* at 88.

24. *Id.* at 162-63.

25. *Id.* at 89.

26. *Id.*

**PROCEEDINGS OF THE 13TH ANNUAL PUBLIC
INTEREST ENVIRONMENTAL CONFERENCE:**

**“Talk, Technology, and Techniques:
Game Plan for Green”**

The University of Florida Fredric G. Levin College of Law hosted the 13th annual student-run Public Interest Environmental Conference (PIEC) March 1st through March 3rd, 2007. Attendees, including students, academics, attorneys, public officials, and representatives from non-profit and government organizations from around the country, contributed to the success of this year’s conference. PIEC 2007 sought to address positive environmental action through exploring innovative and encouraging talk, technologies, and techniques that could lead to a new “Game Plan for Green.” In particular, this year’s conference highlighted the need for collaboration and cooperation among groups with a diversity of perspectives, but a shared commitment to sustainability.

Keynote presentations at the conference focused on partnerships between the corporate arena and the environmental arena, a technique that is perhaps not revolutionary, but necessary in order to have a lasting impact. The conference kicked off with Thursday’s reception speaker, Jil Zilligen, Vice President of Sustainable Business Practices at Nau, Inc., an outdoor apparel company integrating environmental, social and economic factors, and a unique business strategy built around sustainable business practices, innovative use of technology, and philanthropic partnerships. Ms. Zilligen’s engaging presentation impressed the audience and provided a model for thoughtful corporate involvement with environmentalism.

The conference’s opening plenary session featured five leading faculty: David Driesen of Syracuse University College of Law; Charles Kibert of the UF College of Design, Construction and Planning; Patrick Parenteau of Vermont Law School; J.B. Ruhl of Florida State; and Joseph Tomain of the University of Cincinnati College of Law. Their presentations included creative techniques for engaging market competition as an environmental protection tool, valuing ecosystem services, reshaping energy policy, promoting green building, and the continued need for litigation in attaining sustainability. All five presentations provided a seamless transition into the panel presentations, which addressed the “Talk, Technology and Techniques” concept in more depth. Panels fell into one of three tracks, Green Design, Green Infrastructure, or Green Institutions, and addressed new sustainable strategies re-

lated to a broad range of topics including green building standards, affordable housing, rural stewardship, ecosystem services, corporate responsibility, the media, and education.

Ray Anderson, Founder and Chairman of Interface, Inc. served as the keynote speaker for the conference banquet. With Anderson's expertise, Interface, Inc. has become a leader in sustainable industry by redesigning processes and products, pioneering new technologies, and increasing the use of renewable materials. As a leader in the corporate world, Mr. Anderson truly has the ability to galvanize similarly-positioned company executives. His inspiring presentation provided an excellent example of his power to persuade others to go green.

In addition, a well-attended and well-presented Saturday morning workshop, organized by the UF Leadership Development Institute, encouraged effective communication with corporate leaders. The interactive session provided environmental professionals, citizen activists, business leaders, and government officials with skills to improve communication and develop relationships to promote sustainability as a corporate goal. The Saturday grand finale plenary featured a discussion of ethics and sustainability by Wal-Mart Vice President for Environmental Compliance Phyllis Harris, and former EPA Regional Administrator for Region IV, John Henry Hankinson.

The following articles are contributions by several conference presenters who participated in this year's panel discussions.

The 14th Annual PIEC is scheduled to take place February 28th through March 1st, 2008. We hope that you will be able to attend. For more information about the conference, please visit our website at www.ufpiec.org.

Ryan Baya & Adrienne Dessy
Co-Chairs, PIEC 2007

* The individual authors of the articles in these proceedings accept responsibility for the accuracy of their information, quotations, and citations.

ENVISIONING NEXT-GENERATION GREEN BUILDINGS

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KEVIN GROSSKOPF²

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Keywords

sustainable construction, green building, next-generation green building, future green buildings, LEED

Summary

The rapid increase in green building activity in the US over the past 5 years is a sign that sustainable construction is taking root. As of March 2007, over 50 million square meters of buildings have been registered as green buildings under the US Green Building Council's building assessment standard, Leadership in Energy and Environmental Design for new construction known (LEED-NC). A

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proliferation of LEED assessment standards for other types of construction are emerging. LEED for Existing Buildings (LEED-EB), LEED for Commercial Interiors (LEED-CI), and LEED for Core and Shell (LEED-CS) are now in use. In spite of the major success of the green building movement in the U.S. in the past 10 years, its long-term success is by no means assured. The current suite of green building standards is based on existing materials and methods, design tools, and fee structures. True innovations have difficulty emerging for several reasons: (1) there is no well-recognized definition of a green building; (2) general approaches for green buildings have not yet been established, for example, closing materials loops, passive design, building hydrologic cycle optimization, and integration with natural systems, to name but a few; and (3) there are no specific goals or targets for green building performance. This paper addresses the future of the green building movement and suggests that enormous changes in approaches, here referred to as *radical sustainable construction*, are needed to produce what can be truly referred to as green buildings.

I. INTRODUCTION

In countries with successful green building programs, architects, engineers, and builders are employing largely existing methods and simulation tools, and off-the-shelf technologies to design and construct facilities with lower environmental impact, reduced resource consumption, and significantly improved interior environments. Although new tools, materials and systems are beginning to emerge to serve this marketplace, the pace of development is slowed by a lack of a strategic vision for green buildings. In 1998, in the United States, the U.S. Green Building Council (USGBC) developed the first version of the Leadership in Energy and Environmental Design (LEED) building assessment system to guide the design of green buildings. LEED relies largely on existing standards and incremental changes, rather than radical shifts, in design and construction methods for the purpose of creating high-performance buildings. Although it is clear that LEED results in the creation of environmentally improved buildings, it is much less clear in what direction it and other similar standards are directing green buildings. It is also uncertain as to what strategies should be employed to produce the next generation of green buildings and indeed what the desired outcomes of future green buildings should be. This paper suggests several major considerations that should be included in the development of future versions of LEED and other similar building assessment systems

to insure the next generation of green buildings, those that will be designed and built in two decades, far more closely represent truly green buildings. The ideal green building should have five major features: (1) Integration with local ecosystems, (2) Closed loop materials systems, (3) Maximum use of passive design and renewable energy, (4) Optimized building hydrologic cycles and (5) Full implementation of Indoor Environmental Quality measures. These future green buildings, here referred to as 'radical' green buildings, should provide significant improvements on today's first generation green buildings. Compared to present generation green buildings, radical green buildings should be far more integrated with ecological systems to create a synergistic relationship between human and natural environments. Natural systems can process waste, uptake stormwater, assist with heating/cooling, create natural amenity, and provide calories in the form of food. Radical green buildings should also be comprised of materials and products that are reusable and recyclable in a deconstructable building. Greatly reduced energy and potable water use, perhaps by as much as Factor 10, are required for buildings to sustain their consumption of energy. Finally, radical green buildings should integrate all Indoor Environmental Quality measures, to include air quality, noise and sound control, temperature/humidity, light quality, and odor control, into an integrated approach.

II. GREEN BUILDING PROGRESS IN THE US AS AN EXAMPLE

The rate of growth of green buildings in the U.S. has been nothing short of astonishing. As noted in Table 1, since 1998 the number of registered green buildings using the LEED building assessment system has increased from 0 to about 3,000 and the number of certified green buildings has increased from 0 to about 300. In the vernacular of the USGBC, a building is considered *registered* if the project team or owner has formally applied to the USGBC to have the building rated and has paid the appropriate fees. A *certified* building is one that has completed the entire journey through design and construction, all paperwork required for assessment has been filed with the USGBC, and the USGBC has notified the owner of the final level of performance (platinum, gold, silver, or certified). Until recently the LEED building assessment system was comprised of one version, LEED for New Construction (LEED-NC). There are now several other versions of LEED available for use on projects: LEED for Existing Buildings (LEED-EB), LEED for Commercial Interiors (LEED-CI) and LEED for Core and Shell (LEED-CS). Table 1 also includes other pertinent in-

formation about green building progress in the US. The USGBC provides training for building industry professionals and as indicated in the table, about 23000 have attended classes on LEED or other aspects of green buildings. The USGBC also accredits professionals in the application of LEED to building projects and over 25,000 have been officially recognized as LEED Accredited Professionals (LEED-AP). It is estimated that 1 to 5% of all new commercial/institutional building projects in the US are LEED registered or certified. The USGBC fully expects even more explosive growth in the future as the LEED-EB system, which addresses greening the vast stock of existing buildings, takes root.

Table 1 Green Building Progress in the US Using the LEED as the Metric

LEED METRICS*	2005	2004	2003	2002	2001	2000	1999
NC Registrations+	1794	1733	1061	603	312	45	0
NC Certified Projects	180	167	82	38	5	0	0
NC Total million m ²	>22	>21	>14	>8	5.1	0.1	0
EB Registrations+	19	6	0	0	0	0	0
EB Certified Projects	14	12	2	0	0	0	0
EB Total million m ²	>0.9	>0.1	0	0	0	0	0
CI Registrations+	21	8	0	0	0	0	0
CI Certified Projects	24	21	0	0	0	0	0
CI Total thousand m ²	>68k	25	0	0	0	0	0
Total Workshop Attendees	22,821	22,495	14,606	7,905	NI	NI	NI
NC Accredited Professionals	19,342	19,200	5,978	2,443	NI	NI	NI

*Cumulative, includes previous year's data; e.g. 2002 includes 1999-2002

+Number of registrations does not include pilot projects.

NI = No Information

In addition to buildings that utilize LEED for measuring their performance, there are probably a substantial number of buildings that have been designed and built using other green building standards, notably in the area of residential construction. A wide variety of residential green building programs exist in various regions of the US, each created by local homebuilder associations or local government. Although the precise number of buildings af-

affected by these programs is not known, it is probable that it is a substantial and growing fraction of new home construction in the US.

III. SHORTCOMINGS AND LIMITATIONS OF CURRENT US GREEN BUILDING STANDARDS

An examination of the LEED-NC building assessment standard is instructive in understanding the state of the art of green buildings. LEED-NC has six different categories with points as indicated in Table 2 and the LEED-NC 2.2 ratings corresponding to various point ranges is indicated in Table 3.

Table 2 Categories and Points Structure of LEED-NC 2.2

LEED-NC 2.2 Category	Maximum Points
1. Sustainable Sites	14
2. Water Efficiency	5
3. Energy and Atmosphere	17
4. Materials and Resources	13
5. Indoor Environmental Quality	15
6. Innovation and Design Process	5
Total Possible Points	69

Table 3 LEED-NC 2.2 Ratings

LEED-NC 2.2 Rating	Points Required
Platinum	52-69 points
Gold	39-51 points
Silver	33-38 points
Certified	26-32 points
No Rating	25 or less points

The LEED-NC standard (version 2.2 is the most recent issue) is rigid with respect to points, categories, and ratings and as is the case with the other LEED standards, is considered a 'one size fits all' approach to green building assessment. There is not a weighting system based on climate, bioregion, and other factors. Consequently buildings in Alaska and Florida are rated in virtually the same fashion, although the majority of the energy points are a function of location. Buildings in desert climates in locations such as Nevada and those in relatively water-rich states such as Louisiana have a maximum of 5 points allocated for water efficiency. LEED-NC is not based on what might be called a scientific approach for its structure. The categories, points, and ratings are based on the consensus of the committee that developed it. The actual points within each LEED category are also highly arbitrary. Table 4 shows the points allocated in the Materials and Resources category. The point structure is based primarily on materials reuse, use of recycled content materials, and the use of local materials. It does not use life-cycle assessment (LCA) or other technical approaches to assist in the decisionmaking process. Although it does at least partially address closing materials loops, it falls far short in this respect. It does not, for example, address the future extraction of resources from the building and it barely addresses the composition of the products that comprise buildings. Although sustainable forestry is certainly an important issue, this point, as is the case with several others, is subject to a certain amount of gamesmanship in which products are specified solely for the purpose of achieving this point. The strength of LEED is its relative simplicity and ease of use. Unfortunately this is also probably its major shortcoming. Using LEED, a green building can be designed and built with no understanding at all of the rationale for green buildings.

Table 4 Points Allocated in the Materials and Resources Category of LEED-NC 2.2

Materials and Resources: 13 Possible Points		
Prerequisite 1	Storage & Collection of Recyclables	Required
Credit 1.1	Building Reuse (Maintain 75% of Existing Shell)	1
Credit 1.2	Building Reuse (Maintain 100% of Shell)	1
Credit 1.3	Building Reuse (Maintain 100% of Shell and 50% Non-Shell)	1
Credit 2.1	Construction Waste Management (Divert 50%)	1
Credit 2.2	Construction Waste Management (Divert 75%)	1
Credit 3.1	Resource Reuse (Specify 5%)	1
Credit 3.2	Resource Reuse (Specify 10%)	1
Credit 4.1	Recycled Content (Specify 25%)	1
Credit 4.2	Recycled Content (Specify 50%)	1
Credit 5.1	Local /Regional Materials (20% manufactured locally)	1
Credit 5.2	Local/Regional Materials (of 20% above, 50% harvested locally)	1
Credit 6	Rapidly Renewable Materials	1
Credit 7	Certified Wood	1

IV. KEY STRATEGIES FOR RADICAL GREEN BUILDINGS

As noted above, several key strategies that should be standard practice future green buildings include (1) Integration with local ecosystems, (2) Closed loop materials systems, (3) Maximum use of passive design and renewable energy, (4) Optimized building hydrologic cycles and (5) Full implementation of Indoor Environmental Quality measures. The following sections describe how each of these elements can be implemented in next generation green buildings.

A. Integration with Local Ecosystems

One of the strategies that can have relatively large benefit-cost ratio for green buildings is extensive integration of ecosystems and landscape with buildings. Ecosystems have the potential for assisting the heating and cooling of buildings, storing stormwater, providing wastewater treatment, providing for calorie (food) pro-

duction, serving an artistic function, and providing environmental amenity (Kibert, Sendzimir, and Guy 2002). Although integration of ecosystems with buildings has been tried on a limited basis, there are few if any cases of the full integration of landscaping with the built environment. The actual approach to ecosystem integration will vary greatly depending on the bioregion, the character of local ecosystems, local weather patterns, development density, the character of local soils, and other factors. Consequently it should be expected that integration of built and natural environment will vary greatly around the world and that the potential level of integration will also vary depending on a wide variety of factors.

B. Closed Loop Materials Systems

One of the key strategic goals of any sustainable construction effort must be the closing of materials loops. This is a daunting task because it means that buildings will have to be designed for deconstruction and all products comprising the building must be able to be disassembled into their constituent materials. Clearly the products must be reusable or the materials comprising the products must be recyclable. Thermodynamics dictates that some level of material waste will be created in manufacturing and recycling and this waste must be harmless as it dissipates into the environment. Finally the extraction, production, and use of resources must be harmless throughout the entire process, including materials dissipation at each stage in the materials cycle.

C. Maximum Use of Passive Design and Renewable Energy Systems

Few green buildings today are climate responsive, that is, take advantage of local renewable energy sinks and sources, to include solar, wind, rain, groundwater, and the earth in the vicinity of the building. Passive design is only minimally implemented. In fact, buildings should be fully integrated and designed to be heated, cooled, ventilated, and lighted by local resources. New design strategies and integrated tools are sorely needed to assist the creation of far more effective passive building designs. Rather than designing passive heating, cooling, ventilation, and lighting systems separately, tools that simultaneously address the whole building performance are needed to implement what might truly be called *systems thinking*.

D. Optimized Building Hydrologic Cycles

Potable water is in short supply in most areas of the world and the cost of processing wastewater continues to escalate due to rising infrastructure and energy costs. Additionally in many locales, stormwater handling and processing is technically difficult and expensive. Present design approaches address water supply, wastewater, and stormwater as separate issues rather than in an integrated fashion. Current generation green buildings utilize ultra low flow fixtures as the primary means of reducing potable water consumption. A limited number are incorporating rainwater harvesting systems and graywater systems to further reduce potable water use. The use of natural systems to process wastewater is a greatly under-explored possibility with a huge potential for reducing energy and infrastructure costs as well as developing a synergistic relationship with natural systems where nutrients are provided for the benefit of ecosystems. Similarly the potential for using trees and other biomass for uptaking stormwater is virtually unexplored and, as is the case with natural system processing of wastewater, significant savings in energy and infrastructure are a potential outcome. Another possibility for storing stormwater and processing it in a more natural manner is the use of eco-roofs or 'green' roofs on structures. Again, the problem, as is often the case in implementing sustainable construction, is the integration of disparate approaches into a overall approach.

E. Full Implementation of Indoor Environmental Quality Measures

Of all the areas of focus in sustainable construction, the one with the greatest potential payback is attention to indoor environmental quality (IEQ). Preliminary analysis of emerging green buildings in the US indicates a factor 10 or more payback in health and performance of building occupants compared to, for example, energy savings. At present a fully integrated approach to IEQ for green building does not exist. Although the causes of poor building health are fairly well known, an systematic approach to providing the wide range of quality needed for healthy buildings is yet to be developed. This is a potentially complex issue because IEQ includes air quality (chemical and biological), noise, lighting, vibration, views to the exterior, temperature, and humidity.

V. THE ISSUE OF SCALE

Many optimal approaches to resolving green building issues are not able to be implemented at single building scale. Particularly in urban environments, the employment of natural systems to replace manufactured systems can be challenging because of a scarcity of green space and an absence of significant ecosystem area. For example, the use of wetlands for processing wastewater and/or stormwater depends on significant areas of ecological systems, either natural or constructed, for this purpose. Consequently some next-generations green buildings may require a much larger scale, perhaps as large as a *bioregion*, where large areas of forest and wetlands process waste streams from urban areas in a manner that benefits the natural systems. This approach has many potential benefits: reducing energy and infrastructure costs, reduced use of chemicals for treatment, and benefits in the form of nutrients to natural systems. Similar arguments could be made for the implementation of renewable energy systems where tracts of land are used for wind energy and photovoltaics. It is also possible that natural systems will have a role to play in the so-called "hydrogen economy" where photosynthetic strategies are used to breakdown water to produce hydrogen. In many of the cases describe here the ecological systems that are integrated into a sustainable built environment strategy can provide environmental amenity as well as be a source of food. Agricultural areas could benefit from urban proximity with the flows of nutrients and water from cities benefiting farms, forests, plantations, and other systems providing food and resources for industry. Large scale composting where all organic waste, to include wood, paper, other organic fiber waste, and food waste from construction and demolition activities, as well as from farms, homes, restaurants, and offices are processed into nutrients for use in farming, forestry, urban landscapes and other suitable end uses. The issues of large scale integration of sustainable built environments with natural systems is a little explored area that needs to be further developed to create truly improved building performance.

VI. OTHER STRATEGIES

Several other significant strategies are needed for the design of the next generation of green buildings, those one to five decades into the future. For example, industrial ecology has been making steady progress in the redesign of industrial systems. Indeed most of the products comprising buildings are manufactured by exactly

these industrial systems and the lessons learned from the automobile and electronics industry, to name a few, certainly apply to building products.

A. Industrial Ecology

First noted as a discipline in 1989, industrial ecology has morphed from its original roots in industrial symbiosis to a broader range of options that include Design for the Environment (DfE). One of the emerging green building strategies for closing materials loops is Design for Deconstruction (DfD) which addresses strategies for building structures with the intention of facilitating component and materials recovery when the structure become technically or economically obsolete. In effect, the industries that manufacture building products should have the same requirements as other industries that have been subjected to regulation such as *Extended Producer Responsibility*.

B. Biomimicry

Biomimicry emerged as a concept popularized by Janine Benyus (1997). Biomimicry could be called ‘strong ecological design’ because it advocates using exactly the same materials and processes utilized by nature. The general rule could be stated as: If the material or process is not present in nature, it should not be used in the human sphere. Materials produced by nature are produced locally, breakdown when their useful life is expended, and the breakdown products are used by nature in a continual process of constructing new materials. Nature does produce ‘toxins’ as opposed to the ‘toxics’ often created in industrial processes. The difference is that toxins are produced in small quantities, for defensive purposes, and breakdown into raw materials for recycling by nature. In contrast, toxics are generally persistent, are not used for defensive purposes, and may dissipate around the planet, with negative consequences virtually everywhere.

VII. EVOLVING ECOLOGICAL DESIGN

Virtually every definition of green building includes the statement that ecological design, or a parallel concept such as sustainable design, is essential to the design of green buildings. In fact, ecological design as such does not exist in any coherent manner. There is scant evidence of any attempt to mimic nature, use natural system processes, apply biomimicry, or employ any other measures that in

any way relate to ecology. Clearly the ecological background of the vast majority of built environment professionals needs to be reinforced because ecology has not traditionally been a part of their educational process. The result is that it is highly unlikely that any real lessons from nature can or will be part of the design of green buildings. Remedying this deficiency is a long-term process which is yet to begin. As important as understanding ecology is as a prerequisite for implementing ecological design, a newly emerging discipline, often referred to as *applied ecological design*, is equally important. Understanding what lessons from nature apply to the human sphere and the difference between using nature as model or metaphor would greatly benefit the development of ecological design.

As high-performance green building evolves, it is likely that the three basic contemporary approaches will be synthesized into an integrated process and that ecological design will become a part of a new design process. The three contemporary processes alluded to here are: vernacular design, the technological approach, and the biomimetic (based on biomimicry) approach (Kibert 2005).

A. Vernacular Design

Vernacular architecture embeds cultural wisdom and an intimate knowledge of place into the built environment. It is technology or applied science that evolved by trial and error over many generations in locations all over the planet as people designed and built the best possible habitat with the limited resources in their locale. With respect to designing high performance buildings, vernacular design is the closest approach to true ecological design available today. A good example of vernacular architecture is the traditional residential design of Florida referred to as *cracker architecture*. In this vernacular form houses and buildings are constructed off the ground, creating flow paths for air around and through the structure, allowing ventilation and conditioning by the prevailing winds. Originating in the early 1800's, the cracker house is well-designed for the region's hot, humid climate, and emulates the *chickee* of the Seminole Indians, a covered structure with open sides, the floor an elevated platform 3 feet above the wet ground, used for dining and sleeping. The galvanized, metal roof of cracker buildings is durable and reflects Florida's daily intense solar radiation away from the structure. The structure is lightweight and energy shedding, and, rather than absorbing energy, reflects it, thereby helping to maintain moderate interior temperatures.

Modern cracker architecture buildings retain the appearance of the traditional cracker buildings, with metal roofs, cupolas, and porches, but employ modern technology to meet the needs of contemporary business and homes. As is the case with much of today's vernacular architecture, some of the original features, such as the capability for passive ventilation, are for all practical purposes due to year round reliance on modern HVAC systems. Additionally, although useful for smaller buildings, cracker architecture is difficult to apply to large buildings because the roof tends to become inordinately large and for urban office buildings, the porches can lose their appeal.

B. The Technological Approach

In contrast to the Vernacular Vision which uses historical wisdom and cultural knowledge to design buildings, the Technology Approach follows generally along the path of current trends in society. Contemporary society, especially in the developed world, has a love affair with technology. Technological optimism, the feeling that all problems, to include resources shortages and environmental problems can be solved simply by developing new technology, is the prevalent attitude. For buildings, technological solutions revolve around developing new energy technologies such as photovoltaics and fuel cells, and finding technical solutions to the problem of how to more effectively utilize renewable energy sources. High technology windows with spectrally selective coatings and gas-filled panes, control systems and computer systems that respond to optimize energy use based on weather and interior conditions, energy recovery systems that incorporate dessicants to shift both heat and humidity, and materials incorporating post-industrial and post-consumer waste are typical examples of a high technology approach. Contemporary commercial and industrial buildings are equipped with a wide range of telecommunications and computer technologies that challenge even the most intelligent vernacular design approaches, simply because of the needs to remove the large levels of energy generated by the tools of the workplace. Indeed it could be argued that the technology of the building itself must be carefully matched and coupled to the technologies employed by the building occupants.

The Technological Approach to high performance green building is an evolution of current practices. Over time the built environment professions, backed up by experience, research, and the development of better systems and products, will be able to design build-

ings that are much more resource efficient than today's green buildings and have far lower impacts in their construction and operation. The key characteristics of the ultimate high performance green building are based on incremental improvements in existing technology and are probably unlikely to be radical changes to today's practices.

C. The Biomimetic Approach

Popularized by Janine Benyus in her book, *Biomimicry: Innovation Inspired by Nature* (1997), the idea of using nature's designs and processes as the basis for human goods and services, is one that has much appeal when it comes to considering high performance buildings. She refers to biomimicry as "...the conscious emulation of life's genius." A biomimetic strategy, that is one based on biomimicry or imitation of nature, is a relatively recent idea that may provide many of the answers to finding approaches to create the ultimate high performance building. Biomimicry is fundamentally about observing nature and basing materials and energy systems on these observations. Beautiful ceramic seashells are produced at ambient water temperatures from materials in the environment, with no waste, with the result being elegant products perfectly designed for their function of protecting their inhabitants. In contrast, ceramics created by human technology are produced at temperature of several thousand degrees, consuming significant energy and producing emissions to air and water, and solid waste. The materials and resources for production of the ceramics must often be transported significant distances, increasing the energy investment. There are many other examples of biomimicry that can be adapted as safe and sound technological approaches: Nature's ability to convert sunlight into chemical energy via photosynthesis, the phenomenal information storage and transmission capability of nerves and cells, tremendously strong and lightweight materials, powerful adhesives, to name a few. Chrissna du Plessis (2003) described a fanciful future built environment based on a full-fledged implementation of biomimicry in a true, out-of-the-box thought process. All components of the building are biologically based and created from proteins, with solar energy collectors embedded in portions of the structure facing the sun. The structure is strong and lightweight and glued together with powerful adhesives based on those used by mussels to attach themselves to rocks in cold, murky water. Temperature and humidity are regulated by membranes that allow energy and moisture to move in and out of the occupied spaces, with embedded

nano-processors controlling the movement. Like all other components, the membranes are self-repairing, self-regulating, and self-cleaning. Waste from the activities and functions of the building's inhabitants is processed by living machines that breakdown waste into nutrients for use in the food gardens, which is also designed to be self-reproducing and diverse, minimizing pests. At the end of its useful life, the entire building is able to be digested with the organic components being cycled for other uses and the mineral and other inorganic materials collected for recycling and reuse.

VIII. CONCLUSIONS

The initial or first stage of sustainable construction has been underway for perhaps 15 year and has made enormous progress. The next stage of evolution will have to cope with significantly higher energy costs, an increased threat of climate change, a still rapidly growing world population, the depletion of key resources, the introduction of thousands of chemicals whose impacts are not well-known, increasing air and water pollution, growing levels of solid waste, and a host of other local and global environmental problems. Today's green buildings, while a dramatic improvement over conventional construction, are rooted in conventional design approaches, existing methods of analysis and design tools, and dependent on off the shelf products and materials. The next generation of green buildings will have to be radically different from today's versions and will be designed using integrated systems approaches that can assist in the implementation of the major approaches suggested here: deconstructable buildings, reusable components, recyclable materials, integration with ecosystems, optimized hydrologic cycles, extensive employment of passive design and renewable energy, and full implementation of indoor environmental quality measures. The research and development to test these concepts at various scales cannot begin soon enough. Clearly the education and training of building industry professionals will have to also accommodate these changes, not only in the realm of high performance buildings but also to broaden awareness of ecology in order to more fully develop the critical area of ecological design. Finally, success in the ambitious endeavor to develop next generation buildings will depend greatly on the collaboration of the vast array of building product manufacturers in designing products that can be disassembled, recycled, and reintegrated into new products.

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HOUSING OPPORTUNITIES IN FLORIDA: THE STATE HOUSING TRUST FUND

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I. INTRODUCTION

This article examines the emerging role of the states in the face of federal devolution by testing the degree to which state housing trust funds meet legislated goals and target identified local housing needs. After outlining defining characteristics based on a review of the literature, this article assesses implementation of the largest housing trust fund in the country. Florida's State Housing Initiatives Partnership (SHIP) program represents a noteworthy model due to its relative longevity, significant level of assistance, and legislated commitment to flexibility and to coordination with housing planning. Do local governments effectively target housing needs given specific trust fund characteristics: facilitating public-private partnerships, particularly with non-profits; flexibly meeting critical housing needs, and informing funding decisions based on local housing plans?

Based on the assessment of state housing trust funds across the country, Florida has not only the largest but also the only such form of housing assistance available as a guaranteed block grant to

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local governments throughout the state. After defining the term and outlining housing needs in Florida, this study reviews a qualitative analysis of 30 local governments in the state undertaken to determine the type and nature of certain trends in implementing SHIP during the program's first 10 years.

A. State Housing Trust Funds Defined

Since Delaware established the first state housing trust fund in 1968, the number of states adopting this flexible form of assistance has grown considerably, especially given the federal government's declining support of affordable housing. In addition to the social benefits associated with addressing lower income households' housing needs, such assistance contributes to economic health in several ways: leveraging public assistance with private funds, creating jobs, paying for goods and services associated with the development of such housing, and increasing property values and thus local tax revenue. A national study conducted in 2001 estimates that on average every dollar of housing assistance leverages nine times that amount from private and other governmental sources and that a \$5 billion construction and rehabilitation program would generate approximately 184,300 jobs.¹

Due in part to their touted flexibility and the resources they provide, housing trust funds have been accepted across the nation as a powerful tool to augment federal programs and attract private sector partners. Statewide oversight offers the opportunity to more effectively address local resistance to affordable housing programs and to require that adopted comprehensive plans and housing needs assessments inform implementation of local housing strategies. Currently, thirty-nine states maintain housing trust funds, and several of these have multiple statewide programs.²

1. Center for Community Change, *Home Sweet Home: Why America Needs a National Housing Trust Fund* 19 (2001).

2. The author is working on a related study that assesses state housing trust funds across the country. Mary Brooks at the Center for Community Change completed a study in January 2007 that assesses state, regional, and local housing trust funds. While the author and Brooks include both funded and unfunded state trust funds in their respective studies, Brooks includes Washington, D.C. as a state housing trust fund while this author does not. Further, this author includes New York, which has had a consistently funded state housing trust fund program since 1985, while Brooks does not because New York's fund receives revenue from appropriations instead of a dedicated funding source. This author maintains that unlike several states, such as California, that have housing trust funds without any current revenue, New York has been funded throughout its history and should be included. Further, New York's situation is not unique. For instance, Georgia's constitution prohibits use of dedicated funding sources, so the state appropriates general revenue every year to its state housing trust fund. With the exception of Delaware's program, the next state housing trust fund was not established until 1982. In fact, the majority (61%) of state housing trust

Further, efforts continue to establish such a program at the national level.³

Housing trust funds should be understood as just one incentive-based strategy that in combination with other forms of assistance and regulatory tools represent an effective comprehensive approach. Though substantive differences exist among state housing trust funds, the term is generally defined based on the following characteristics: maintaining permanency, providing a critical match for federal assistance, offering flexibility, facilitating public-private partnerships, and choosing funding targets based on local housing plans.⁴

After reviewing housing needs in Florida, a comparative case study analysis is conducted of 30 randomly selected eligible cities and counties to assess whether local governments effectively meet housing needs given these defining characteristics. In addition, this study includes a temporal component to determine how implementation within each of these communities has changed during the first 10 years of the program. These findings suggest issues and opportunities associated with this increasingly popular form of housing assistance and pave the way for a more detailed survey of Florida and a broader understanding of state housing trust funds across the country.

B. Current Conditions in Florida

Among households earning 80% or less of area median income,

funds have been established over the past 17 years.

3. See Nancy Bernstine & Irene Basloe Saraf, *New Rental Production and the National Housing Trust Fund Campaign*, 12 *Journal of Affordable Housing* 389 (2003). Bernstine and Saraf provide a detailed account of efforts to establish a national housing trust fund from an initial campaign in the mid-1990s to more recent efforts beginning with legislation introduced in 2000. While various bills have moved forward since that time in both the House and the Senate, they have never been approved. The National Low Income Housing Coalition is currently advocating passage of legislation that, like previous proposals, creates a national trust fund that targets extremely low income households (those earning 30% or less of area median income) and that is funded through government sponsored enterprise legislation. The Federal Housing Finance Reform Act of 2007, H.R. 1427, includes language for such a fund and recently was discussed at a hearing of the House Financial Services Committee. See National Low Income Housing Coalition, *Memo to Members*, 2007(11), http://www.nlihc.org/detail/article.cfm?article_id=3992&id=40.

4. Mary E. Brooks, *Housing Trust Fund Progress Report 2007* (2007); Mary E. Brooks, *Housing Trust Fund Progress Report 2002* (2002); Mary E. Brooks, (1997) *Housing Trust Funds: A New Approach to Funding Affordable Housing*, in: W. van Vliet (Ed) *Affordable Housing and Urban Redevelopment in the United States* 229 (1997); Justin Linker, Chris Shay, & Christine Hall, *Affordable Housing Trust Funds*, November Fannie Mae Foundation Issue Brief (2001); Michael A. Stegman, *State and Local Affordable Housing Programs: A Rich Tapestry* (1999); Charles E. Connerly, *A Survey and Assessment of Housing Trust Funds in the United States*, 59 *Journal of the American Planning Association* 306 (1993); David Rosen, *Housing Trust Funds* (1987).

Florida's 2005-2010 statewide Consolidated Plan projected housing needs across the state based on cost burden as 769,977 units for renter households, with 60.1% of extremely low income households (earning 0-30% of area median income) in need of rental housing, and as 711,048 units for owner households.⁵ The 2004 hurricanes significantly exacerbated these conditions with 708,631 primary residences (roughly 10% of the non-seasonal housing stock) in the state sustaining some kind of damage.⁶ Almost 36% of these households had incomes of \$20,000 or less with 57% at incomes of \$30,000 or less.⁷

While the need is more critical among the lowest income households, even working class households (those earning up to 120% of area median income) are struggling with housing payments. In some parts of the state, the median value of a home has increased in recent years ten times as fast as the area's median income. A 2005 study ranks several of the state's metropolitan areas as some of the most price-inflated housing markets in the country, among them Naples, Port St. Lucie, Miami, West Palm Beach, Sarasota, and Fort Lauderdale.⁸

The situation is worse for low-income renters. In Florida, the fair market rent (FMR) for a one-bedroom unit is \$687, meaning that a wage earner would have to earn \$13.21 per hour — much more than the minimum wage — in order to afford a standard rental unit in Florida.⁹ Over 60% of extremely low income households (those earning 0-30% of area median income) lack affordable rental housing.¹⁰ Further, the state is losing affordable rental units. During the next 15 years, over 17% of Florida's assisted rental units are expected to be lost.¹¹

5. Florida Department of Community Affairs, *State of Florida Consolidated Plan, Federal Fiscal Years 2005-2010* 23 (2004).

6. Florida Hurricane Housing Work Group, *Recommendations to Assist in Florida's Long Term Housing Recovery Efforts*, 9, 32 (2005), <http://www.floridahousing.org/Home/Newsroom/Publications/Hurricane+Housing+Work+Group.htm>.

7. Florida Hurricane Housing Work Group, *Recommendations to Assist in Florida's Long Term Housing Recovery Efforts*, 9, 12 (2005), <http://www.floridahousing.org/Home/Newsroom/Publications/Hurricane+Housing+Work+Group.htm2005>. Compare these incomes with the median income for the state in 2004, which was \$49,461.

8. R. J. DeKaser & J. G. Charamonde, *House Prices in America: Valuation Methodology and Findings*, (2005), <http://www.nationalcity.com/corporate/EconomicInsight/default.asp>.

9. National Low Income Housing Coalition, *Out of Reach 2005*, (2005), <http://www.nlihc.org/oor2005/data.php?getstate=on&state%5B%5D=FL>. As defined by the U.S. Department of Housing and Urban Development (HUD) for purposes of its rental programs, FMR reflects rent and utilities for a modest unit based on local conditions.

10. Florida Department of Community Affairs, *State of Florida Consolidated Plan, Federal Fiscal Years 2005-2010*, (2004).

11. Florida Affordable Housing Study Commission, *Final Report — 2005*, (2005). The majority of this loss among assisted units will occur due to the expiration of affordability

What solutions are available to address these challenges? Adequate, affordable housing should be considered essential to accommodate Florida's growing population, just like adequate roads, sewer, water, and schools. This approach "makes provision of affordable housing an explicit responsibility of local governments, with such responsibility tied to a local comprehensive plan prepared under a set of rules and regulations established by the state."¹² Thus the state maintains oversight, but the local government designs the specifics of the program and implements it so that sufficient affordable housing is in place as new residents arrive. Florida's housing trust fund, SHIP, is intended to function in this fashion.

II. FLORIDA'S HOUSING TRUST FUND

In 1988, the Florida Legislature stated — "[b]y the year 2010, this state shall ensure that decent and affordable housing is available for all of its residents."¹³ Four years later, they adopted the SHIP program.¹⁴ As a housing production program that meets the needs of lower income households,¹⁵ the dual purposes of the program were clear from the outset — creating jobs while striving to meet the state's housing mandate.

The State Housing Initiative Partnership Program is created for the purpose of providing funds to counties and eligible municipalities as an incentive for the creation of local housing partnerships, to expand production of and preserve affordable housing, to further the housing element of the local government comprehensive plan specific to affordable housing, and to increase housing-related employment.¹⁶

All 67 counties and entitlement cities, which are the largest cities in the state and receive federal housing assistance directly, are eligible.¹⁷ Monies in the trust fund are generated by an in-

periods associated with various state and federal housing programs.

12. Marc Smith & Ruth Steiner, *Affordable Housing as an Adequate Public Facility*, 36 Valparaiso University Law Review 443, 444 (2002).

13. FLA. STAT. § 420.0003(2) (1988). This goal remains in the 2006 Florida Statutes.

14. FLA. STAT. § 420.907 (1992).

15. SHIP assists very low- (earning 50% or less of area median income), low- (earning 80% or less of area median income), and moderate- (earning 120% or less of area median income) income households. See FLA. STAT. § 420.9071 (2006).

16. FLA. STAT. § 420.9072 (1992, 2006).

17. Entitlement cities are cities that receive Community Development Block Grant and HOME funds directly from the federal government. In 1992, 40 communities in the

crease in the state documentary stamp tax on deeds, and the program was fully funded in May 1995.¹⁸ Funding is allocated on a per capita basis with the exception that smaller counties, some with under 10,000 residents, are guaranteed a minimum of \$350,000 annually.¹⁹

Program requirements reflect the broad coalition of housing advocates, realtors, home builders, bankers, and city and county officials that came together to provide the non-partisan support for its passage. This coalition has been challenged recently by an unsuccessful proposal in 2004 to sunset the program entirely, by the recapture over the past three years of a portion (39%) of the trust fund, and the 2005 legislative decision to make these cuts permanent as of fiscal year 2007-2008.²⁰ Currently the amount of funding available annually through SHIP is \$166.4 million.²¹

Funds must be used as follows: 30% must assist very-low income households, another 30% must assist low income households, 65% must target homeownership strategies, and 75% must be used for new construction or rehabilitation.²² Assistance towards the purchase of a home (downpayment assistance) qualifies under new construction or rehabilitation if the household receives the funding to move into a recently constructed or rehabilitated home.²³ A small percentage of funds can be used for program administration.²⁴ The legislation also includes restrictions on the timeline for

state were entitlement communities. In 2007, the total is 51.

18. With passage of the Sadowski Act in 1992, an additional ten-cent tax per \$100 was collected as part of the documentary stamp tax with 50% designated to the state for a variety of housing initiatives and the remaining 50% designated through SHIP to local governments. As of July 1995, an existing 10 cents of the tax was redirected from general revenue to the trust fund. This additional dime was split with 12.5% going to the state and 87.5% to local governments, resulting in an overall split of the housing trust fund of 31% to the state and 69% to local governments in the form of the SHIP program. See FLA. STAT. § 201.15 (2006).

19. FLA. STAT. § 420.9073(3) (2006). This guaranteed amount for smaller counties was initially \$250,000.

20. Jaimie Ross & Mark Hendrickson, *What Happened to Housing in the 2006 Session?* 22 (2) Housing News Network 1 (2006).

21. *Id.* Please note that the total amount of funding available in fiscal year 2006-2007 through the state's housing trust fund is \$433 million. The remainder of the funding goes to ongoing statewide programs such as the State Apartment Incentives Loan program (\$42.4 million with a one-time additional \$30 million targeting extremely low income households) and temporary programs such as those targeting hurricane relief (\$92.9 million). This article focuses on the SHIP program, which represents the majority of this funding and whose structure and targets have remained virtually unchanged since passage of the trust fund legislation in 1992.

22. FLA. STAT. § 420.9075(5) (2006).

23. F.A.C. 67-37.007(3)(f) (2006).

24. FLA. STAT. § 420.9075(7) (2006). Up to 5% of the amount received can be used for administrative expenses except that cities and counties receiving \$350,000 or less can use up to 10% for such purposes as can those local governments whose governing boards

encumbering (targeting) and expending these funds.²⁵

To receive SHIP assistance, all participating local governments must submit a Local Housing Assistance Plan (LHAP). In addition to specifying housing strategies and income groups targeted, the LHAP also identifies participating private sector partners, especially non-profits, and outlines the ways in which the program “furthers” the local Housing Element.²⁶ Thus a critical component of the LHAP is its consistency with and its implementation of the adopted Housing Element, the community’s housing plan.

Since 1985, Florida has been a model of state-mandated planning, requiring each local government to adopt a Housing Element, with objectives and policies based on data outlining local housing needs, as part of its broader Growth Management Plan. Beginning in 1993, the state required all local governments to apply a “uniform approach to identifying local housing needs in the context of projected growth.”²⁷ This top-down, one-size-fits-all approach to growth management in Florida has been rightly criticized.²⁸ Further, to be effective these plans must also contribute to a broader, integrated local and regional planning strategy.²⁹ Still, the LHAP together with the local Housing Element and the Consolidated Plan, which is required of all local governments receiving direct federal assistance from HUD, outline housing needs, policies, and funding targets and thus meet many of the criteria for useful local housing plans.³⁰ Thus, the SHIP program’s touted flexibility is intended to be responsive to distinct and divergent local housing needs and to implement or “further” adopted policies.

III. DESCRIPTION AND ANALYSIS OF THE THIRTY SAMPLED LOCAL GOVERNMENTS

Given the climate of increasing housing needs across Florida,

adopt a resolution allowing up to 10% to be used for administration.

25. F.A.C. 67-37.005(6)(f)1 (2006). Local governments must encumber SHIP funds within one year of receiving them and expend those funds within another two years.

26. FLA. STAT. § 420.9072(2)(a)1 (2006).

27. Paul F. Noll et al., *Florida’s Affordable Housing Needs Assessment Methodology*, 63 *Journal of the American Planning Association* 495, 507 (1997).

28. See *Id* and Judith E. Innes, *Group Processes and the Social Construction of Growth Management: Florida, Vermont, and New Jersey*, 58 *Journal of the American Planning Association* 440 (1992).

29. See Philip R. Berke & Maria M. Conroy, *Are We Planning for Sustainable Development? An Evaluation of 30 Comprehensive Plans*, 66 *Journal of the American Planning Association* 21 (2000) and Dennis E. Gale, *Eight State-Sponsored Growth Management Programs. A Comparative Analysis*, 58 *Journal of the American Planning Association* 425 (1992).

30. See David P. Varady & Charlotte T. Birdsall, *Local Housing Plans*, 6 *Journal of Planning Literature* 115 (1991).

especially among the lowest income households,³¹ in the face of continuing reductions in federal dollars,³² alternative forms of assistance, such as state housing trust funds, offer a particularly critical resource. A comparative qualitative study of program implementation was conducted to gain a greater understanding of key issues and to determine how local governments have adjusted their strategies and targets over time. The methodology involved analyzing material based on the defining characteristics of trust funds in general and the requirements of the SHIP program in particular for fiscal year 1992-1993 (FY 92-93), the first year of the program, and fiscal year 2001-2002 (FY 01-02). This material included the following documents:

- the LHAPs,
- Annual Reports that document how the funding was actually expended,
- Housing Elements, and
- Consolidated Plans, only available if the local government receives direct federal assistance — some of the smaller counties do not.

For this study, 30 Florida cities and counties that participate in the SHIP program were randomly selected. The sample is representative of the range of funding distributions — small, medium and large — and the percentage of cities and counties that participate in the program. The mandated \$350,000 minimum for rural counties establishes the limit for the small category, which includes cities that fall at or below this amount; distributions of \$1 million or more represent the large cities and counties with medium communities falling in between.

A. Overview of Comparative Findings

Based on analysis of the sample data, certain trends are evident when comparing percentage of funds expended in FY 92-93 to

31. In assessing progress toward meeting the state's 2010 goal of ensuring decent and affordable housing is available for all its residents, the 1999 Florida Affordable Housing Study Commission noted that "the additional 22,134 housing units provided with 1998 program funds allowed Florida to keep up with only two-thirds of the growth of cost burdened households during that year, and did not provide for the backlog of 1.35 million cost burdened households." See Florida Affordable Housing Study Commission, *Final Report — 1999* 13 (1999), http://www.dca.state.fl.us/fhcd/ahsc/1999%20Report/99_ahsc_rep.pdf.

32. The amount of federal assistance declined from \$83.6 billion in 1976 to \$34.3 billion in 2002. See Cushing Dolbeare & Sheila Crowley, *Changing Priorities: The Federal Budget and Housing Assistance, 1976-2007* (2002).

FY 01-02 (see Figure 2). Owner strategies are consistently the primary focus, with well over the 65% minimum devoted to these types of assistance. Due to the significant increase in total distributions that the communities realized with the designation of the additional dime from general appropriations to the trust fund in 1995, the slight decrease in percentages for FY 01-02 versus FY 92-93 masks practically a tenfold increase in SHIP dollars between the two periods. Among the thirty communities, rental strategies increased slightly during the 10-year period, because less funding is devoted to SHIP administration, but still lie well below the maximum possible. The percentage of funds targeting the strategy "Rehabilitation or Construction" remained steady. A much higher percentage of very-low income units were assisted relative to moderate income units in FY 92-93 as compared to percentage of funds targeting strategies for very-low relative to moderate income in FY 01-02.³³ Thus the relative emphasis on very-low income has declined somewhat, which is not surprising given the focus on homeownership.

While SHIP might be the sole source of guaranteed assistance many rural counties receive, the entitlement cities and larger counties all receive federal assistance in the form of CDBG and HOME program funds. Developers in all these communities also can apply for the competitive federal Low Income Housing Tax Credits (LIHTC) and State Apartment Incentive Loan (SAIL) funds. As noted in the introduction to this article, SHIP represents just one incentive-based strategy that can be combined with other forms of assistance and regulatory tools to establish a more comprehensive approach to local housing needs. Those communities receiving HOME funds that target ownership strategies use SHIP as the required match for this federal program. Further, SHIP can be combined with LIHTC or SAIL, both of which target construction and rehabilitation of lower income rental housing, to augment the smaller percentage of SHIP funding that can be used for rental strategies. In fact, based on this sample, local governments (22 in FY 92-93, 21 in FY 01-02) appear to be using SHIP with a broad range of other housing programs so that they leverage SHIP funds to make these housing strategies viable. The federal HOME and CDBG programs are the most commonly used out-

33. In FY 92-93, income targets were measured based on units assisted. In FY 01-02, income targets were measured based on percentage of funds devoted to strategies targeting very-low, low, and moderate income households respectively. Due to this change in program requirements tying income targets to funding expended (FY 01-02) rather than units assisted (FY 92-93), it is difficult to clearly compare this data between the two years. Thus this discussion compares the very-low income to moderate income ratio for each of the two program years.

side sources of assistance. None of these programs specifically target extremely low income households — those earning 30% or less of area median income.

B. Income Targets

Based on this sample, while the legislation allows all the funds to be targeted at very-low and low-income households, quite a few local governments target moderate income households — serving those who earn above 80% to 120% of median income. In FY 92-93, 57% of the sampled communities assisted moderate income households; in FY 01-02, that percentage had risen to 80%. Further in FY 01-02 only seven of the thirty sampled governments targeted a majority of their funds at very-low income housing assistance. Another study of twenty-two local governments found a significant lack of SHIP assistance committed to extremely low-income households.³⁴

C. Homeownership Strategies

Given the emphasis on homeownership, it is not surprising that so many local governments target moderate income households. In FY 01-02, with the exception of two counties — both of them large — all sampled local governments spent significantly more than the 65% minimum on homeownership activities with almost half (13 out of 30) targeting all their funding on such strategies. Overall, 83.9% of the SHIP funding among the sampled governments benefits homeownership, down slightly from FY 92-93 when 86.5% of the funding was devoted to homeownership (see Figures 2 and 3). The number of assisted owner units has fallen more dramatically from 94.4% in FY 92-93 to 75.6% in FY 01-02.

In FY 92-93, 73.3% had offered downpayment or purchase assistance, and all had offered some form of owner rehabilitation. By FY 01-02, all of the thirty sampled local governments funded purchase assistance and owner rehabilitation. Targeting downpayment assistance exclusively at first-time homebuyers was a common strategy in FY 01-02 used in ten of the thirty communities, and in most cases, this assistance could be combined with repairs to existing homes under contract. Further, half of the local governments (15 of the 30 sampled) offered or required housing counseling as part of the purchase assistance strategy.

34. Stanley Fitterman, (2004) *Serving the Extremely Low Income with SHIP*, 20 (2) Housing News Network 13 (2004).

Downpayment and rehabilitation incentives were often in place prior to passage of SHIP, so local governments simply used the trust fund to augment these ongoing strategies. The emphasis on these two resident-based strategies translates into the majority of FY 01-02 SHIP funds (63%) directly benefiting eligible households — providing a dollar-for-dollar reduction in costs directly to the eligible household — as opposed to targeting developers, where a percentage of the funding provides an incentive for developer participation.

D. Rental Strategies

Despite the emphasis on homeownership, the number of communities among the random sample targeting rental strategies has increased 62.5% since FY 92-93 (from 8 to 13). While practically half devoted less than 10% of their FY 01-02 funds to these housing strategies, the percentage of funds targeting these strategies still reflected a slight increase from that in FY 92-93 (see Figures 2 and 3). Once again, the significant increase in total funds available for participating local governments in 1995 and thereafter translated into greater absolute amounts distributed to each government and often a much higher number of units assisted. In addition, more local governments reported the use of LIHTC and SAIL funds with SHIP to assist low income rental units. Still, only one local government among the 30 in FY 01-02 began to approach the maximum percentage allowable, devoting 32.2% of its funding to rental housing strategies.

E. Depth of Subsidy

In its LHAP, each local government must indicate the maximum amount of assistance per unit available under each housing strategy. Given the increase in housing costs across the state, this amount, which reflects depth of subsidy for strategies such as downpayment assistance and owner rehabilitation, was expected to be higher among the 30 sampled communities in FY 01-02 as compared to FY 92-93. Instead the maximum amount of assistance per unit designated for particular strategies did not change or fell among the 30 communities when comparing the first year of the program, FY 92-93, and FY 01-02. A recent study of FY 99-00 and FY 00-01 SHIP assistance also assessed depth of subsidy.³⁵

35. Stanley Fitterman & Wight Gregor, *Purchase Assistance Programs: The Role of Housing Costs and Area Incomes in Determining Subsidy*, 19(1) Housing News Network 13

The authors specifically focused on one strategy — purchase (downpayment) assistance — and examined whether a relationship exists between the depth of subsidy for the purchase assistance offered and the affordability index they constructed for that area based on sales price data and median income. Using regression analysis they found that the subsidy amount did *not* vary based on widening gaps between house prices and incomes.³⁶ These findings indicate that local governments have tended not to adjust depth of subsidy sufficiently as housing costs have increased.³⁷

F. Implementation of the Ship Program

In their LHAPs for FY 01-02, only two of the sampled local governments clearly outlined how their Housing Element and/or Consolidated Plan, the two planning documents that outline local housing needs and the resulting policy directions, informed their SHIP funding targets. Another two communities referred to general housing needs assessments. Of the remaining 26 sampled local governments, 20, or over 66% of the total, made no mention of the Housing Element or Consolidated Plan. Of the six that did, in most cases the relevant policies were simply listed with no discussion of how these policies, some quite broad and vague, informed targeting and expenditure of SHIP funds. This is not a significant improvement from the first year of program implementation when administrators were still trying to ascertain exactly what the program required. For FY 01-02, most of the communities did discuss their partnerships with private sector housing agencies, many of them nonprofits, as a means to implement the program, so that this goal of the legislation was much more clearly implemented.

IV. FINDINGS AND IMPLICATIONS

Study findings suggest that within the broad parameters of their defining characteristics, housing trust funds can offer a wide variety of housing assistance. Local housing administrators have clearly used SHIP consistently with program requirements, assisting a total of 141,324 eligible housing units to date.³⁸ As a produc-

(2003).

36. *Id.*

37. Reviews of more recent SHIP LHAPs indicate that many communities have increased their depth of subsidy significantly.

38. Governor's Affordable Housing Study Commission, *Draft of the 2007 Report on the SHIP Program*, (2007).

tion program targeting home ownership and augmenting construction related employment in the state, SHIP been particularly effective. In addition, it is providing a critical match for the HOME program, a federal mandate. While the diversity of homeowner rehabilitation and downpayment assistance strategies has increased since FY 92-93, other strategies are rarely implemented, or if they are, funded at minimal rates. Minimal evidence exists to indicate that local administrators are informing their expenditure of SHIP funds based on local goals, objectives, and policies as outlined in planning documents such as the Housing Element. Further, the focus on assisting moderate income households has increased since the inception of the program, raising the question of whether these funds target a local community's most critical housing needs. Altogether, these findings suggest a more narrow local focus than that encouraged by the legislation.

The increasing number of state housing trust funds attests to the federal devolution of housing programs in the face of ongoing, and often increasing, housing need at the state and local levels and the adaptability of this program type. Yet, lack of resources, political constraints, and in many cases failure to address the most pressing housing challenges continue to characterize these programs, despite their flexible program design. Specifically in Florida, though the state housing trust fund accommodates a range of housing strategies, local governments often narrowly focus the program, failing to implement housing plans and needs assessments in their funding decisions. While Florida's program could be amended to create greater assurances that the most pressing housing challenges are addressed, local governments can make significant adjustments within the program's existing parameters to more successfully target these needs. As certain states have realized, state housing trust funds that mandate coordination with and implementation of relevant housing plans while accommodating local flexibility benefit from the strengths of both levels of government. The proposal for a national housing trust fund, which is gaining strength, should adopt this approach.

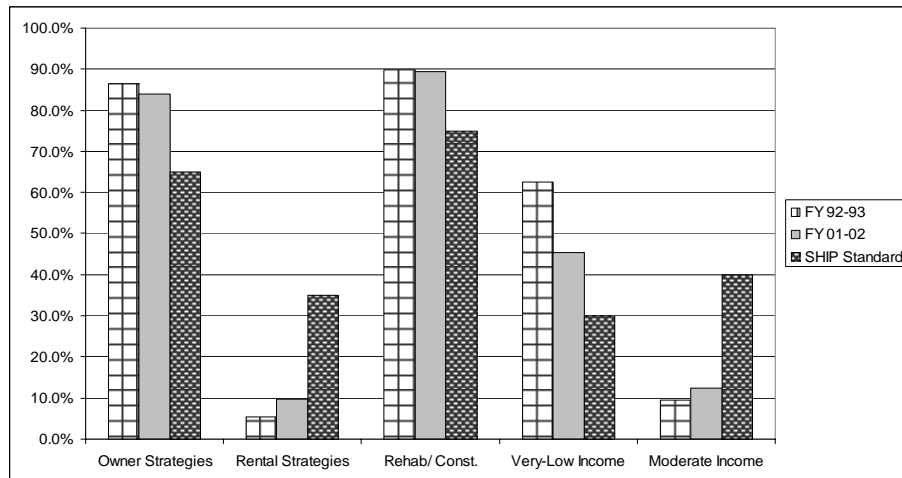


Figure 1. Comparison of Percentages of SHIP Funding Expended among the 30 Sample Communities, FY 92-93, FY 01-02, and the Standards Established in the SHIP Legislation.

Please note: During this 10-year period, the absolute amount of SHIP dollars expended increased dramatically due to the additional funding committed to the SHIP program in 1995. For this reason, the bar chart here shows percentages expended not absolute dollar amounts. The “SHIP Standard” for each housing strategy or income target group reflects the minimum percentage of overall funding that must be devoted to this activity or group, with the exception of Rental Strategies and the Moderate Income category. These two standards reflect the maximum percentage of funding allowed. While Owner Strategies and Renter Strategies cannot overlap, Rehabilitation or Construction (Rehab/Const) can in fact be for rental or owner occupied units.

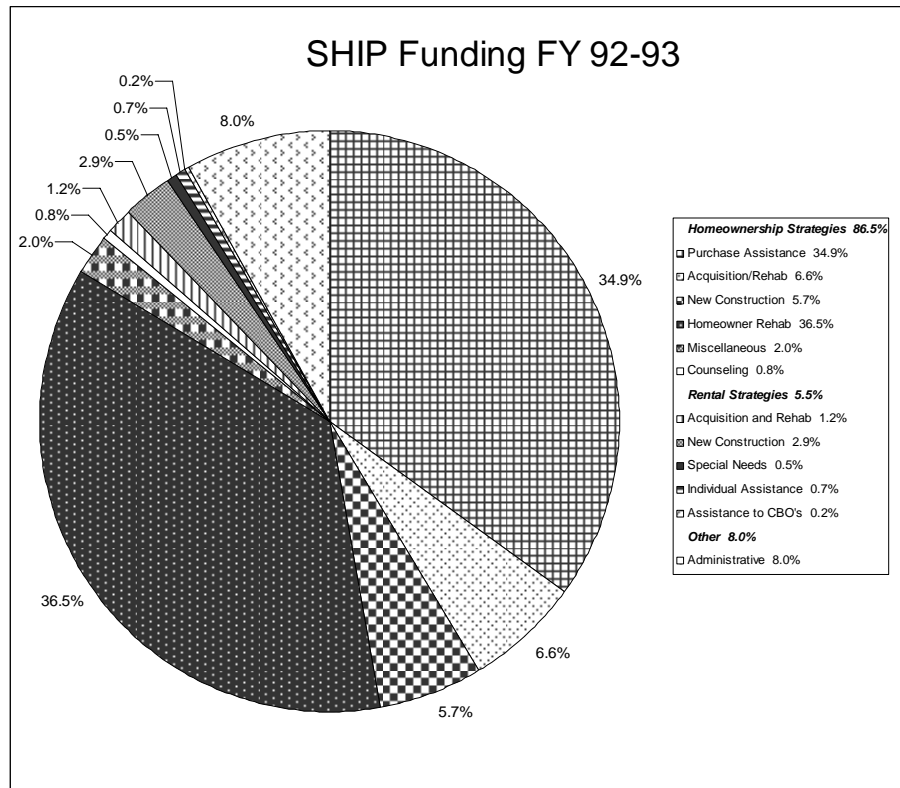


Figure 2. Percentage of Funding for SHIP strategies in Fiscal Year 1992-1993 for the 30 sampled local governments.

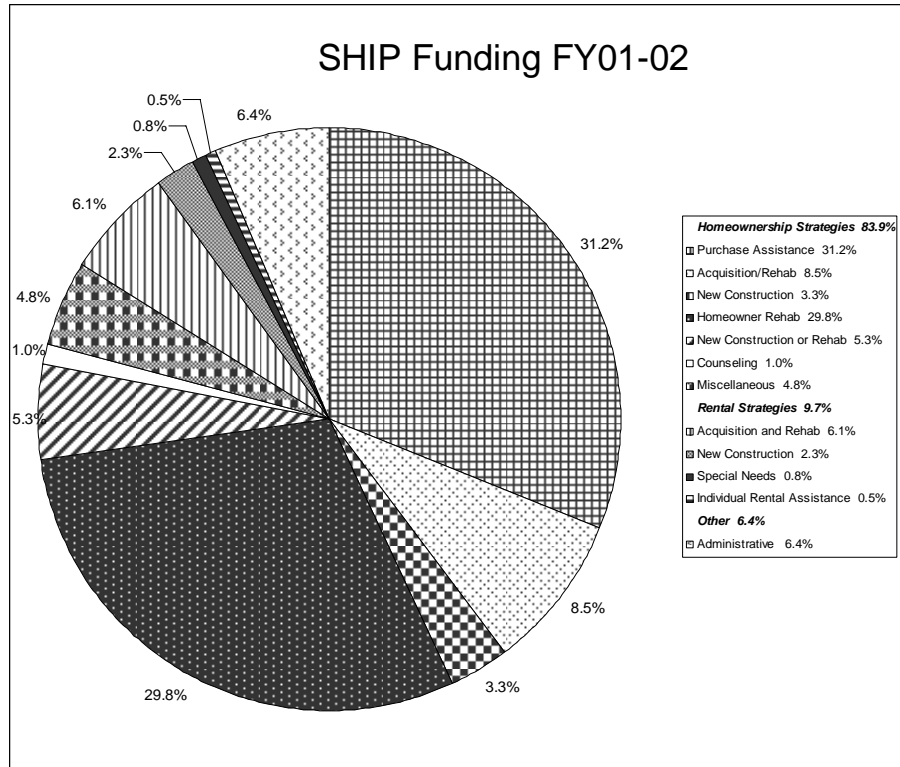


Figure 3. Percentage of Funding for SHIP strategies in Fiscal Year 2001-2002 for the 30 sampled local governments.

GOVERNMENT PAYMENTS FOR ECOSYSTEM SERVICES—LESSONS FROM COSTA RICA

BRIAN C. STEED*

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I. INTRODUCTION

Programs establishing payment for ecosystem services¹ (PES) have become an increasingly popular addition to the environ-

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1. The term “payment for ecosystem services” is taken to be synonymous with the phrase “payment for environmental services.” Both terms refer to payment to landowners to encourage them to engage in land use practices which promote the production of natural services. Most experts conclude that the substantive differences between the terms are minimal. See Sven Wunder *Payments for Environmental Services: Some Nuts and Bolts*. Center for International Forestry Research (CIFOR) Occasional Paper No. 42, 8 (2005), available at http://www.cifor.cgiar.org/publications/pdf_files/OccPapers/OP-42.pdf. But see Scherr, et al. who argue that the terms are substantively different. Sara Scherr, et. al., For Services Rendered. Current Status and future potential markets for ecosystem services of tropical forests: an overview, ITTO Technical Series No. 21 (2004) available at http://www.itto.or.jp/live/Live_Server/724/TS21e.pdf

mental toolbox. Generally speaking, PES programs involve a voluntary transaction where a external entity purchases an ecosystem service from a participating landowner² whose land provides benefits to the local, regional or global environment (and the benefits those environments provide to humans).³ Such programs frequently involve private ecosystem purchasers including individuals, corporations, and non-governmental organizations, while other programs rely on direct governmental payments for ecosystem services.⁴ Recent years have witnessed a proliferation of PES activities worldwide as private and government actors have moved to encourage conservation.⁵

This paper focuses on programs involving direct governmental PES activities in light of what they contribute to environmental conservation generally. To do so, the article draws evidence from a governmental PES designed to promote forest conservation and reforestation in the Central American nation of Costa Rica. There, governmental payments to landowners who have contracted to engage in forest-friendly practices have helped encourage conservation activities over the last 10 years.⁶ As such, the Costa Rican program provides a useful focal point to understanding how PES programs can work in concert with other governmental programs to help landowners conserve.

Before delving into specifics, the paper introduces PES programs by discussing what ecosystem services are and explaining why such services may be underprovided in society without governmental intervention. Section III reviews other governmental efforts to ensure the continued supply of ecosystem services and introduces PES programs generally. Section IV sets out the Costa Rican case and illustrates how the PES program operates and is funded. Section V provides analysis of the Costa Rican case including current enrollment and impacts. Section VI provides conclusions regarding the lessons of Costa Rican program.

2. As used in this context, private land owners may consist of individuals, collective groups, and corporations.

3. *See generally*, Wunder, *supra*, note 1

4. *Id.* at 7-8.

5. *See generally* STEFANO PAGIOLA, ET. AL., EDS., *SELLING FOREST ENVIRONMENTAL SERVICES* (2004).

6. Stefano Pagiola, *Payment for Environmental Services in Costa Rica*, MPRA Paper No. 2010 (2007), http://mpra.ub.uni-muenchen.de/2010/01/MPRA_paper_2010.pdf

II. ECOSYSTEM SERVICES INTRODUCED

A. *Ecosystem Services Defined*

It may be beneficial to first provide conceptual definitions for what is meant by the term “ecosystem services.” In a recent publication, Boyd and Banzhaf state, “[e]cosystem services are components of nature, directly enjoyed, consumed, or used to yield human well-being.”⁷ Other authors have provided more general terms. Geoffrey Heal, for instance, states that biologists refer to ecosystem services as “life-supporting and life enhancing services of natural ecosystems”⁸ Another influential and oft cited definition states:

Natural ecosystems perform critical life-support services, upon which the well-being of all society depends. These include:

- purification of air and water
- mitigation of droughts and floods
- generation and preservation of soils and renewal of their fertility
- detoxification and decomposition of wastes
- pollination of crops and natural vegetation
- dispersal of seeds, cycling and movement of nutrients
- control of the vast majority of potential agricultural pests
- maintenance of biodiversity
- protection of coastal shores from erosion by waves
- protection from the sun’s harmful ultraviolet rays
- stabilization of the climate
- moderation of weather extremes and their impacts
- provision of aesthetic beauty and intellectual stimulation that lift the human spirit.⁹

7. James Boyd and Spencer Banzhaf, Resources for the Future, *What are Ecosystem Services?* DP 06-02, 8 (2006), available at: <http://www.rff.org/rff/Documents/RFF-DP-06-02.pdf>

8. GEOFFREY HEAL, NATURE AND THE MARKETPLACE: CAPTURING THE VALUE OF ECOSYSTEM SERVICES, 1 (2000).

9. GRETCHEN DAILY, ED., NATURE’S SERVICES: SOCIETAL DEPENDENCE ON NATURAL ECOSYSTEMS (1997).

Despite differences in the specific language used, all agree that ecosystem services refer to the benefits stemming from natural systems which are necessary for humans to prosper.¹⁰ Without these services performed, nature can be significantly altered, and life as we currently enjoy it, become more difficult.¹¹

B. The Economics of Ecosystem Services

Private individuals often lack sufficient incentives to maintain property in ways conducive to the production of ecosystem services. Most would consider ecosystem services public goods,¹² which are goods defined by several characteristics—non-rivalry in consumption and difficulty in exclusive ownership.¹³ Basic economics predicts that individuals acting on their own will undersupply public goods.¹⁴

This result occurs precisely because it is difficult to exclude others from using the good.¹⁵ Private supply of public goods involves certain externality problems where a private provider of a public good bears all cost of production, but only gains a portion of the benefits. Those benefiting from the provision, on the other hand, have the temptation to free ride on any individual willing to provide the good. To overcome this problem, groups often form

10. While differences in definitions are glossed over here, many argue precise definitions are required in order to adequately produce ecosystem accounting systems necessary to rightly compensate those producing the services. Boyd and Banzhaf state “[l]oose definitions undermine accounting systems. They muddy measurement and lead to difficulties in interpretation...Accordingly, we seek more rigorously and consistently defined ecosystem service units.” Boyd & Banzhaf, *supra* note 7, at 1-2.

11. To emphasize this point, Duke Law Professor James Salzman points to the experience of Biosphere II, where the models of earth’s natural functions failed to adequately provide the atmospheric cleansing and other ecosystem services usually associated with life on earth. Due to these failings, the Biosphere II experiment prematurely shutdown to ensure the health and welfare of the human participants. This event presented disturbing implications for the real world where if ecosystem services failed to adequately function, we would have no real option to simply shut down the “experiment.” James Salzman, *A Field of Green? The Past and Future of Ecosystem Services*, 21 J. LAND USE & ENVTL. LAW 133 (2006).

12. See generally Heal *supra* note 6 at 31-33. “Public good,” also occasionally referred to as a “collective goods” in the theoretical literature are distinct from private or individually consumable goods. DAVID WEIMER AND AIDAN VINING, (2005) POLICY ANALYSIS, 72 (4TH ED 2005).

13. Rivalry in consumption refers to the ability of one to consume the good without impacting another’s consumption of the same good. Excludability of ownership refers the ability of one user’s ability to exclude another from consuming the good. Public goods are held in contrast to other types of goods: private goods, which are easily excludable and rivalrous in their use consumption; common pool goods, which are not easily excludable, but rival in their use and consumption; and toll goods, which are excludable, but generally not rivalrous in their consumption. *Id.* at 72-78.

14. *Id.* at 78.

15. *Id.*

and act collectively to ensure the continued provision of a desired public good. Indeed, according to many economists and policy theorists, ensuring an adequate supply of a public good is one of the justifications of government intervention.¹⁶ Through collective action, the inequities of the system can be overcome, and each pay their share for the public good.¹⁷

C. Ecosystem Services as Public Goods

To better understand the implications of ecosystem services as public goods, consider a property owner with forested land. The wooded areas on the land perform certain ecological services including, among other things, carbon sequestration, topsoil stabilization, reduced flooding, and aesthetic beauty. The landowner represents one of many individuals who benefit from these services. For example, the landowner's neighbors may draw direct benefits from the aesthetically pleasing nature of the intact woods or may enjoy the wildlife they sustain. Those downstream from the landowner benefit from decreased flooding and water free from the topsoil which may otherwise pollute local streams. Still others in the global community benefit from the carbon sequestration services performed by those woods in conjunction with others globally.

Each of these services does not generally involve rivalry in consumption—aesthetic beauty may be appreciated by many without affecting other's enjoyment,¹⁸ clean stream water can be equally enjoyed by all those downstream,¹⁹ and the benefits from carbon sequestration can be equally enjoyed by many in the global community.²⁰ Additionally, it is difficult or potentially impossible for

16. *Id.*

17. Take for instance, the classic example of national defense as a public good. Once the defense mechanisms are put in place, one individual's reliance on those mechanisms does not impact another individual's (non-rivalry), but it is very difficult to provide the benefits of such security to one individual and not provide the benefits to another living in close proximity (non-excludability). This provides little incentive for private actors to provide for national defense. Rather, many would simply prefer to free ride off the efforts of others. To overcome this problem, individuals have formed collectives which have created rules and mechanisms whereby sufficient resources (from taxation, inscription, or other means), can be accumulated to provide for the general welfare of all. Further rules are put into place to limit the temptation to free ride on other's provision of defense through, inter alia, penalties for failure to pay taxes or not registering for the selective service.

18. Clearly, this argument can only be carried so far. Congestion arising from too many individuals "enjoying" the aesthetic beauty may eventually impact a viewers enjoyment.

19. However, some may benefit disproportionately from the clean stream water. For example, those who rely directly from the stream for consumption, industry, or other uses may benefit more than others who do not rely on the stream for these purposes.

20. Similar to FN 18 & FN 19, the benefits of carbon sequestration may have certain

the landowner to claim exclusive ownership of the services provided. The landowner likely cannot claim compensation from each of the beneficiaries of the services. A bill sent to neighbors to collect for the aesthetic enjoyment of the woods would almost certainly be ignored. There is simply no legal authority which would require the neighbors to pay. Similarly, no authority exists for the landowner to collect from downstream beneficiaries from the clean water or the various beneficiaries of the carbon sequestration performed.

However, in keeping the land in its current condition, the landowner faces various private costs. These may include tax obligations, maintenance costs, management costs, and other expenses found in performing upkeep on the property. In addition to these costs, the landowner forgoes other opportunities in keeping the property in its current condition. These opportunity costs include the lost profits from alternative uses of the property such as revenue generated from non-sustainable intensive forest management,²¹ farming land cleared of trees, or developing the property in other ways for residential, commercial, or industrial use.

The property owner bears the majority of the cost in allowing the ecosystem services to be performed by the wooded area, but only receives a portion of the benefits. In viewing these tradeoffs, many property owners may view it to be in their interest to change the use of the property and claim more private benefits. Doing so may result in a net loss of ecosystem services. But, the landowner only pays a portion of these costs. The total cost is spread across the other local, regional, and global beneficiaries of the wooded area.

III. AVOIDING ECOSYSTEM SERVICE LOSS

A. Traditional Governmental Approaches Promoting Delivery of Ecosystem Services

Governmental intervention has long been used as a means to

disproportionate impacts. For instance, climate experts recently concluded that the world's poorest communities may suffer more from global warming than richer communities. Rahendra Pachauri, the chairman of the United Nations' Intergovernmental Panel on Climate Change recently stated regarding a forthcoming UN report on global warming, "It's the poorest of the poor in the world, and this includes poor people even in prosperous societies, who are going to be the worst hit." Alan Zarembo and Thomas H. Maugh II, *Earth faces a grim future if global warming isn't slowed, U.N. Report Says*, LOS ANGELES TIMES (April 6, 2007) Located at: <http://www.latimes.com/news/science/la-ex-warming6apr06,0,4921051.story?coll=la-home-headlines>

21. Although, intensive forest management including cutting timber may simply be part of management costs if these activities are undertaken in a sustainable manner.

ensure the continued supply of ecosystem services.²² One long established method of ensuring continued provision of ecological services involves designation of protected areas— properties dedicated to conservation such as parks (national, state, and local), wildlife reserves, forestry reserves, conservancy areas, and a variety of other land management designations. In the ideal case, rules are created and enforced in such a way that the incentives to use the property in manners not conducive to the continued provision of ecosystem services are removed. Many protected areas have been created worldwide with significant success that have resulted in continued ecosystem services.²³ Yet, there have also been problems with displaced communities,²⁴ insufficient habitat protection,²⁵ and lack of funding, regulation, and mismanagement.²⁶

A second traditional mechanism involves regulation. There, governments make and enforce rules regarding the use of land which increase costs for undesirable behavior through the imposition of substantial civil or criminal sanctions. Examples of this tool at play in the United States include the Endangered Species Act (ESA) of 1973,²⁷ where United States lawmakers and administrators have sought to protect species through making rules against changing habitats in ways which may harm threatened and endangered species. Despite successes, some have criticized regulations such as the ESA with failing to provide adequate positive incentives for conservation and are inequitable.²⁸

22. People have over the years acted to set up protected areas, regulate, provide incentives for conservation, or otherwise manage land toward natural resource conservation. These activities have often not explicitly stated ecosystem services as their goal. Nonetheless, it is clear that conservation of ecosystem services was often at least an implicit goal of the collective action.

23. One recent United Nations report listed over 11.5% of global surface in protected areas. United Nations, *United Nations List of Protected Areas*, IUCN/UNEP (2003).

24. Government purchase is a best case scenario, but not always the norm. Charles Geisler points out that 70 percent of protected areas globally are inhabited by at least some humans. Government rules make life for locals living in and near the protected areas' boundaries very difficult and may create eco-refugees as populations exit to find areas where they can survive. Charles Geisler *Endangered Humans* FOREIGN POLICY, No. 130 (May-Jun. 2002) pp. 80-81.

25. See Ana S. L. Rodrigues, et. al., *Effectiveness of the Global Protected Area Network in Representing Species Diversity*, 428 NATURE 641-642 (April 2004).

26. The World Commission on Protected Areas (WCPA) notes that despite a large percentage of the earth under protected status, many of these areas "are not effectively managed" while others face "growing financial difficulties as governments cut subventions, forcing protected area managers to raise their own revenue." WCPA *Protected Areas Benefits and Boundaries*, 2 (2000).

27. The Endangered Species Act of 1973, 16 U.S.C. § 1531-1544

28. The incentives offered by the ESA have led to significant discussion regarding the operation of the Act. Some have alleged that landowners who encounter a listed species on their property may have the incentive to "shoot, shovel, and shut up." See generally Gar-

Incentives programs represent a third tool for governmental intervention promoting ecosystem services. These tools have included permitting systems such as tradable development rights, tax credits, ecosystem banking initiatives, and other incentive based programs leading to conservation. Each of these programs relies on providing a carrot in addition or instead of presenting the stick for non-compliance.

B. Payment for Ecosystem Services

Direct government payments for ecosystem services (PES) represent one type of incentive program aimed at stopping the loss of ecosystem services by offering increased direct benefits from conservation activity. Wunder defines PESs as:

- 1) A voluntary transaction where
- 2) A well-defined ES (or a land-use likely to secure that service)
- 3) Is being 'bought' by a (minimum one) ES buyer
- 4) From a (minimum one) ES provider
- 5) If and only if the [ecosystem] service provider secures ES provision (conditionality).²⁹

A variety of PES programs exist and it is important to clearly identify governmental programs as simply one type of PES activity. Private actors (generally corporations and private not for profit entities) have increasingly entered into contracts with landowners to pay for the continued production of an ecosystem service in recent years.³⁰ Examples abound—particularly in the context of payment contracts undertaken by large environmental organizations such as the Nature Conservancy and the World Wildlife Fund. For instance, in one well developed PES program, the World Wildlife Fund is helping to conserve forests on Mt. Rinjani, on the Island of Lombok, Indonesia.³¹ Other examples of private PES programs include various situations where corporations have entered into contracts with private landowners to keep their for-

diner M. Brown Jr. & Jason F. Shogren *Economics of the Endangered Species Act*, 12 Journal of Economic Perspectives 3, (Summer 1998).

29. Wunder, *supra* note 1, at 3. Note that the original text refers to "payment for environmental services." By Wunder's own statement, however, the "substantive difference [between 'payment for ecological services' and 'payment for environmental services'] for our purposes is minimal." *Id.* at 8.

30. *Id.*

31. World Wildlife Fund, *Payment for Ecosystem Services*, (2007) <http://www.worldwildlife.org/pes/>

ested land intact to provide carbon sequestration.³²

Governments or other local collectives, too, have increasingly acted as buyers of ecosystem services. Government programs are generally more expansive than the private programs listed above,³³ but need not be.³⁴ Substantial public programs have been undertaken in a variety of countries for a variety of ecosystem services. Examples of widespread governmental programs involving direct payments can be found throughout Latin America. (i.e. Mexico, Colombia, El Salvador, and Guatemala),³⁵ in the United States,³⁶ China,³⁷ and a variety of other nations worldwide.

IV. THE COSTA RICAN PES PROGRAM

Costa Rica, long renowned for its biological wealth³⁸ and progressive policies promoting conservation,³⁹ began developing a nation-wide PES program in 1997 to encourage private landowners to

32. Id.

33. Wunder *supra* note 29

34. Some local governments and local collectives may become involved to protect the local watershed or other natural feature providing desired ecosystem services. See, for example, John Kerr, *Sharing the Benefits of Watershed Management in Sukhomajri, India* in SELLING FOREST ENVIRONMENTAL SERVICES, MARKET-BASED MECHANISMS FOR CONSERVATION AND DEVELOPMENT 63-72 (PAGIOLA ET AL, EDS 2004), which details the efforts of several local communities in protecting a watershed through an ecosystem payment program.

35. Paul J. Ferraro & R. David Simpson, *The Cost-Effectiveness of Conservation Payments*, 78 LAND ECONOMICS 3 354 (August 2002). The majority of these programs is designed to stay deforestation, although other goals are often considered.

36. Perhaps the best example of this activity in the U.S. is the Conservation Reserve Program on the U.S. Department of Agriculture. In this program, the United States government contracts with agricultural producers "to retire highly erodible and other environmentally sensitive cropland and pasture" for a period of 10-15 years with the intent that the lands are converted to native grasslands, forests, or other "conservation uses providing environmental benefits." USDA, *Conservation Reserve Program: Summary and Enrollment Statistics, FY 2006*, 2 (2006) available at http://www.fsa.usda.gov/Internet/FSA_File/06rpt.pdf.

37. The Chinese government recently set up the Forest Benefit Compensation Fund to restore forests. Forest Trends, *Developing Markets and Payments for Forest Ecosystem Services*, 2 (2007) http://www.forest-trends.org/documents/publications/tech_briefs/7forestservices.pdf

38. Located on the isthmus connecting North and South America, Costa Rica contains an incredible variety of life. Experts assume that despite occupying only .03% of the global land mass, the nation houses over 4% of global biodiversity. Costa Rica is estimated to contain approximately 500,000 species (including 300,000 species of insect) and ranks in the top twenty most biodiversity-rich countries world-wide. Instituto Nacional de Biodiversidad (Inbio), *Biodiversidad en Costa Rica* (2007), available at http://www.inbio.ac.cr/es/biod/bio_biodiver.htm. Other species counts show that Costa Rica contains 850 known species of birds, over 350 known species of reptiles and amphibians, 208 known species of mammals, and over 9000 known species of vascular plants. MARIO BOZA, PARQUES NACIONALES COSTA RICA 7 (1987).

39. Author Sterling Evans, for instance refers to Costa Rica as "the Green Republic" in reference to its storied tradition of pursuing environmental conservation. See STERLING EVANS, *THE GREEN REPUBLIC*, 64-71 (1999).

conserve forested land and reforest cleared land.⁴⁰ Since the inception of the program, it has enrolled approximately ten percent of the nation (532,668 hectares of private land),⁴¹ and is touted as contributing to an increase in forest cover throughout the nation.⁴²

A. Previous Governmental Efforts

The PES program does not represent the first governmental efforts to protect Costa Rica's natural heritage.⁴³ As seen below, Costa Rican government officials have actively sought mechanisms to protect ecosystems and the services they provide since the late 1960s.⁴⁴ In 1969, lawmakers authorized the creation of national parks, forest reserves, national monuments, wildlife refuges, and national conservation zones.⁴⁵ Protected areas were quickly established throughout the country.⁴⁶ By 1999, approximately 28 percent of Costa Rica was contained in protected areas.⁴⁷ These areas encompass a wide variety of ecosystems including cloud forest, lowland wet forest, lowland dry forest, mangroves and other wetlands, and sub alpine paramo (tropical alpine grasslands located above treeline).⁴⁸ Indeed, one leading expert has concluded that if managed appropriately, approximately 95% of Costa Rican biodiversity would be protected in the listed areas.⁴⁹

40. Stefano Pagiola, Paying for Water Services in Central America: Learning from Costa Rica, in *SELLING FOREST ENVIRONMENTAL SERVICES, MARKET-BASED MECHANISMS FOR CONSERVATION AND DEVELOPMENT*, 37 (PAGIOLA, ET. AL. EDS. 2004).

41. FONAFIFO, *Distribución de las hectáreas y árboles contratadas en Pago de Servicios Ambientales, por año y por modalidad*, 2006, http://www.fonafifo.com/text_files/servicios_ambientales/distrib_ha_Contratadas.pdf

42. Estaban Oviedo, País recupera bosque perdido, *La Nación*, 30 de Noviembre, 2006. Available at: http://www.nacion.com/ln_ee/2006/noviembre/30/pais913190.html

43. See generally, EVANS *supra* note 39.

44. *Id.*

45. Lawmakers took this step in the wake of protracted deforestation due to agricultural use and logging. *Id.* at 64-71. Previous governmental efforts at creating protected areas in 1939 and 1945 had largely failed due to absence of monetary and institutional commitment from the government. See DAVID R. WALLACE, *THE QUETZAL AND THE MACAW* 28-35 (1992).

46. See generally EVANS *supra* note 39

47. *Id.* at 7. There has been some debate over the actual amount of protected land, however. In 2003, World Resources Institute recorded some 158 individual protected areas representing 23.4 percent of national area. WRI Biodiversity and Protected Areas—Costa Rica, *Earthtrends Country Profiles*, 1 (2003), available at: http://earthtrends.wri.org/pdf_library/country_profiles/bio_cou_188.pdf. Regardless of the exact percent of protected areas alleged, all concur that approximately a quarter of the nation is currently listed in a government protected area.

48. LES BELETSKY, *THE ECOTRAVELLER'S WILDLIFE GUIDE: COSTA RICA*, 14-18 (1998). It should be pointed out that this list is partial. The topography of Costa Rica allows for a wide variety of habitats found in the protected areas.

49. Alvaro Umana, a leading Costa Rican conservationist, made this judgment with the caveat that this biodiversity could be protected if these areas were managed in accordance with the laws establishing them. Charles D. Brockett & Robert R. Gottfried, *State*

The government of Costa Rica has also developed a significant regulatory regime to encourage conservation. These regulations have provided rules regarding forest protection,⁵⁰ wildlife and endangered species protection,⁵¹ topsoil conservation,⁵² protection of water,⁵³ coastal and mangroves protection,⁵⁴ biodiversity preservation,⁵⁵ and a variety of other regulations.⁵⁶ Many of the regulatory regimes have been formed, shaped, and amended in response to societal and ecological necessity.

Notwithstanding these governmental efforts at environmental protection, Costa Rica maintained one of the fastest deforestation rates in the world throughout the 1970s and 1980s, with the majority of deforestation occurring on private lands.⁵⁷ Image 1 illustrates the deforestation ravaging the country through 1986, with the dark images illustrating the decline in forest cover.

Policies and the Preservation of Forest Cover: Lessons from Contrasting Public-Policy Regimes in Costa Rica, 37 LATIN AMER. RESEARCH REV. 10 (2002).

50. For example, La Ley Forestal, Ley No. 7575, as amended

51. For example La Ley de Conservacion de la Vida Silvestre, Ley No. 7317 as amended

52. For example La Ley de Uso, Manejo y Conservacion de Suelos, Ley No. 7779

53. For example, La Ley de Aguas, Ley No. 276

54. For example, La Ley Sobre la Zona Maritimo Terrestre, Ley No. 6043

55. For example, La Ley de Biodiversidad, Ley No. 7788

56. Some of these regulations include NEPA-like provisions regarding requirements for environmental assessments and impact statements. La Ley Organica del Ambiente, Ley No. 7554, as amended.

57. Evans *supra* note 37 at 49-50.

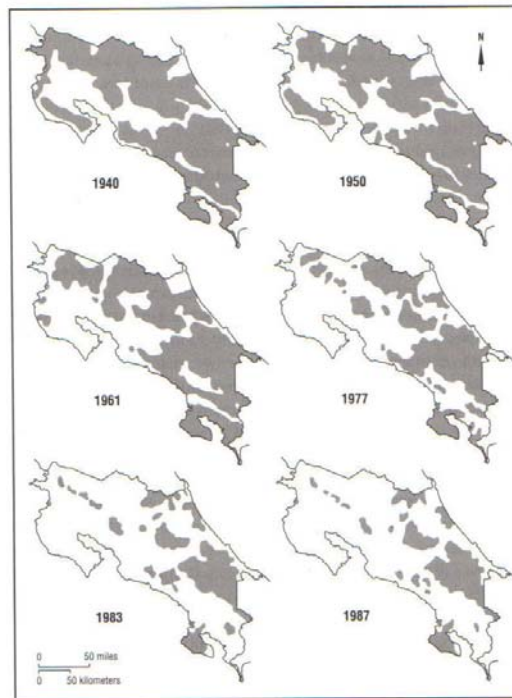


Figure 1—Decline in Forest Cover⁵⁸

Officials began to seek ways to curb this trend by providing positive incentives for private forest conservation and reforestation in the late 1970s.⁵⁹ The first foray into incentives began in 1979 with the introduction of income tax incentives to those landowners practicing reforestation.⁶⁰ In the mid 1980s, policy makers began to search for other incentive based programs. These efforts led to the introduction of the CAF (Certificado de Abono Forestal—Forest Payment Certificates) program in 1986.⁶¹ This program served as a tax credit for those who were engaged in conservation activity on their property. The credit could be applied to any tax owed to the Costa Rican government or could be sold to other individuals. The CAF program attracted a great deal of interest and by 1996, had enrolled over 40,541 hectares of land into the program.⁶²

58. Evans *supra* note at 40. Evans included this image originally created by the Fundacion Neotropica.

59. Ronnie de Camino Et Al, The World Bank, *Costa Rica Strategy and the Evolution of Land Use* 30-31 (2000).

60. *Id.* Income tax incentives were plagued with problems in that the incentive only rewarded reforestation and not conservation. Moreover, income tax in Costa Rica was only paid by the very wealthy. As such, the program did not affect the decisions made by the majority of landowners.

61. *Id.* at 31

62. Marco Vinicio Araya B., *Financiamiento de Bosques y Plantaciones Forestales:*

Based on the success of the CAF program, the CAFA (Certificado de Abono Forestal Adelantado—Advanced Forest Payment Certificates) program was introduced.⁶³ CAFA functioned similarly to CAF, but was specifically designed to provide a prepayment to landowners wishing to undertake reforestation efforts. Like its predecessor, CAFA had a great deal of success and by 1997 had been credited with reforestation of 36,887.80 hectares of land.⁶⁴

Both the CAF and CAFA programs were set to be phased out by the Forestry Law of 1996.⁶⁵ In lieu of these programs, the law established the CCB (Certificados para la Conservacion del Bosque—Forest Conservation Certificates) program which worked similarly to the other programs listed above, but include a 20 year conservation commitment by those who participate, and require that the land not be harvested for a time prior to enrollment.⁶⁶

B. The Costa Rican PSA Program

Building on the incentive programs listed above, Costa Rican governmental officials also began searching for other programs in the mid-1990s to encourage forest conservation and regeneration on private lands. In 1997, the Costa Rica government created the PSA (Pagos por Servicios Ambientales—Payment for Environmental Services) program.⁶⁷ In many ways the PSA program represented a direct continuation of the CAF and CAFA programs listed above.⁶⁸

The PSA program seeks to promote four ecosystem services performed by Costa Rican forests.⁶⁹ These include: 1) Mitigation of greenhouse gas emissions; 2) hydrological services which help protect water for human consumption, irrigation, and energy production; 3) protection of biodiversity; and 4) provision of scenic beauty.⁷⁰ To promote these services, the PSA program allows private property owners to enter contracts with the government to

Pago por Servicios Ambientales, REVISTO FORESTAL CENTROAMERICANA, enero-marzo 17 (1998).

63. de Camino, Et. Al. supra note 59 at 30

64. Araya supra note 62 at 17.

65. Ley No. 7575 passed Feb. 5, 1996, as amended. This Forestry law represented an overhaul of the nation's forestry laws and practices.

66. de Camino, et. al. supra note 59 at 33

67. Ley No. 7575 supra note 65.

68. For instance, the PSA program borrowed the same payment structure listed by the CAF program. Indeed, the first payments came in the form of CAF certificates. Pagiola, supra note 6 at 2.

69. Ley No. 7575, supra note 65 at Art. 3(k).

70. Id.

undertake those land use practices which enable the continued provision of the listed forest ecosystem services. The details of the program are discussed below.

1. *Eligibility and Contracting*

Enrollment in the PSA Program is completely voluntary, but regulations may restrict the amount of land an individual landowner can enroll in the program. An individual landowner is allowed to enroll up to 300 hectares in the program.⁷¹ Landholdings by an NGO are not subject to any enrollment cap for the number of hectares in the program.⁷² Enrollment of land by indigenous groups within Indigenous Reserves is capped at 600 hectares.⁷³

Private landowners can individually contract with the government to enroll their land, or the landowners can cooperate with larger NGOs.⁷⁴ If the private party acts alone, he/she is responsible for undertaking a private contract. If the landowner acts in concert with others through an NGO, the program allows for a global contract covering several listed properties.⁷⁵ Indigenous groups enter the program through a contract specific to indigenous reserves with the contracting entity as an entity representing the reserve.⁷⁶

Not all private land in Costa Rica is in similar condition and not all landowners share the same land management goals. In light of these facts, the PSA program offers several types of contracts. The principle contract types which have existed since the creation of the PSA program include forest conservation contracts and reforestation contracts.⁷⁷ A third type of contract targeting sustainable forest management and sustainable forestry was available prior to 2000.⁷⁸ An agro-forestry contract was introduced

71. Edgar Ortiz Malavasi & John Kellenberg, *Program of Payments for Ecological Services in Costa Rica*, IUCN Forest Conservation Program, 4 (2002) available at: http://www.iucn.org/themes/fcp/publications/files/flr_costarica/flr_ortiz_kellenberg_ext.doc

72. *Id.*

73. Indigenous reserves are treated as a special category in that land within the reserves is generally not owned by individuals, but is rather held collectively by members of the indigenous group.

74. Malavasi & Kellenberg, *supra* note 71

75. *Id.*

76. *Id.*

77. Pagiola, *supra* note 6 at 3. Pagiola, notes that while the Costa Rican government uses the term “reforestation” contract, the actual intent of governmental operations seems geared toward promoting timber plantations with the use of this type of contract. Pagiola chooses to refer to these types of contract as “timber plantation contracts” to avoid any confusion as to this intent. While I understand this reasoning, I have chosen to keep the language used by the Costa Rican officials.

78. These contracts committed property owners to sustainable forestry over a 15 year period and entailed payouts of approximately \$327 U.S. for each hectare enrolled dispersed

in 2004 and efforts are currently ongoing to create a contract for natural forest regeneration.⁷⁹

Each of these contracts has different management goals and payout schemes. For instance, a forest conservation contract has the goal of protecting established primary secondary growth forests.⁸⁰ Property owners contract to leave their property in its current condition for a period of five years—with the possibility of renewing the contract for future five year periods.⁸¹ In consideration of these conservation efforts, the government of Costa Rica pays enrollees in forest conservation contracts approximately 42.00⁸² dollars per year for each hectare enrolled, with payments continuing over a five year period (210.00 from the five-year total). These contracts account for the majority of participants in the PSA program.⁸³

In contrast to forest conservation contracts, a reforestation contract is designed to promote tree growth in areas previously degraded or abandoned agricultural land, with particular emphasis on the establishment of timber plantations.⁸⁴ These contracts are considerably more lucrative—with payments totaling about \$550.00 U.S. per enrolled hectare distributed over a five year period.⁸⁵ The contract, however, also requires a larger commitment with the landowner contracting to maintain the reforested area for a period of fifteen to twenty years—depending on the tree species selected for reforesting.⁸⁶ Due to more stringent enrollment requirements these contracts represented less than 10% of all PSA program participants in 2002.⁸⁷

In 2006, the government of Costa Rica announced a new payment scheme.⁸⁸ Forest conservation contracts now pay \$64 dollars

over each five year period of the 15 year commitment. Malavasi and Kellenberg note that nine percent of PSA contracts in 2002 involved sustainable forestry. Malavasi & Kellenberg *supra* note 71 at 4

79. Pagiola *supra* note 6 at 3.

80. Malavasi & Kellenberg, *supra* note 71 at 4

81. *Id.*

82. The actual amount has until recently been placed in Colones, the national currency of Costa Rica. The figure given represents the exchange rate value *Id.*

83. *Id.* at 5

84. Pagiola, *supra* note 6 at 3.

85. *Id.* at 7. The payment scheme for reforestation contracts dictates a 50% distribution in year one, 20% distribution in year two, 15% distribution in year three, 10% distribution in year four, and 5% distribution in year five. Malavasi & Kellenberg, *supra* note 71 at 5. This distribution occurs in this fashion to account for the frontloaded capital investment required to replant trees, which diminishes once the trees are established.

86. *Id.*

87. *Id.*

88. This change was announced in Decree No. 22336 Decreto No. 22336—MINAE, Artículo 2. Available online at: http://www.fonafifo.com/text_files/servicios_ambientales/Decretos/Dec32226.pdf

per year/ hectare enrolled for each year over a five year period.⁸⁹ Reforestation contracts now bring \$816 paid out over the duration of ten years.⁹⁰ Some experts fear that the increase in payment represented in the forest conservation contracts exceeds the money available.⁹¹ Accordingly, the increases in payouts may actually reduce the amount of contracts which can be offered in the future.⁹²

2. *Planning, Monitoring, and Enforcement*

Once the type of contract is selected, the landowner submits an application to enter the PSA program.⁹³ Before the land is enrolled, each landowner is required to develop a sustainable forest management plan for the property in accordance with the contract sought.⁹⁴ The plan is prepared by a certified private forester known as a "regente."⁹⁵ Each plan includes information regarding:

land tenure and physical access; topography, soils, climate, drainage, actual land use, and carrying capacity with respect to land use; plans for preventing forest fires, illegal hunting, and illegal harvesting; and monitoring schedules.⁹⁶

In the application, the landowner specifically promises to undertake the specific practices laid out in the plan.⁹⁷ From the government side, applications, contracting, and monitoring within the PSA program is handled by the National Forest Financing Fund, known by its acronym FONAFIFO (Fondo Nacional de Financiamiento Forestal).⁹⁸ This government agency operates eight regional offices throughout the country to facilitate local outreach for the Program.⁹⁹ FONAFIFO officials accept the application. If the

89. Id.

90. Id.

91. Pagiola, *supra* note, 6 at 7-8.

92. Id.

93. Applications for entry in the PSA program can be obtained at any of the FONAFIFO regional offices or online. Examples of the applications can be found at http://www.fonafifo.com/paginas_espanol/servicios_ambientales/sa_requisitos.htm

94. Simon Zbinden and David R. Lee, *Paying for Environmental Services in Costa Rica: An Analysis of Participation in Costa Rica's PSA Program*, 33 *WORLD DEVELOPMENT* 2, 257 (2005).

95. Id.

96. Pagiola *supra* note 6 at 7.

97. Zbinden & Lee *supra* note 94 at 257.

98. Pagiola, *supra* note 6 at 7. FONAFIFO undertook this task in 2003. Prior to that time, SINAC (Sistema Nacional de Areas de Conservacion—National System of Conservation Areas) managed the contracts in conjunction with several not for profit agencies.

99. Participants must contact the regional office closest to the property to be enrolled. FONAFIFO, *ESPP Processes and Requirements*, available at: <http://www.fonafifo.com/>

plan contained in the application is deemed satisfactory, the land is enrolled in the program.

The first payment from the PSA generally occurs when the plan is accepted. However, further payments come only after verification that the plan is being carried out.¹⁰⁰ The regente who helped develop the land management plan generally also performs the monitoring to ensure that the plan is acceptably placed into action.¹⁰¹ Various documents are submitted verifying compliance to the terms of the contract throughout its duration.¹⁰²

As payment for development of the plan and monitoring to ensure that the plan is placed in action, the regentes usually receive 15 percent of all payments on the land.¹⁰³ If violations are found by the regente, they must be reported to the government and payments cease.¹⁰⁴ If a regente is found to be falsifying management plans or not reporting violations of those plans, the government may remove the regente's professional forester license as well as face other legal sanctions.¹⁰⁵ FONAFIFO performs occasional audits on regentes' work to ensure that no fraud is being perpetrated.¹⁰⁶

3. *Funding for the Program*

While FONAFIFO now oversees the PSA program, the original function of the agency was to gather and distribute funds for the PSA program.¹⁰⁷ As designed, the PSA program was to obtain funding from a variety of sources. Particular focus was placed on the beneficiaries of the ecosystem services performed by Costa Rican forests with the intent that these beneficiaries carry the brunt of the responsibility to finance the fund.¹⁰⁸ To date, this end has not been met.¹⁰⁹ Yet, significant steps have been made toward beneficiaries paying for the services provided.

Interestingly, the government of Costa Rica has sought to fund the PSA program by generating income for the beneficiaries of the

[paginas_english/environmental_services/sa_requisitos.htm](#)

100. Pagiola, *supra* note 6 at 7

101. Zbinden & Lee, *supra* note 94 at 257

102. *Id.*

103. *Id.*

104. *Id.*

105. *Id.*

106. Pagiola, *supra* note 6 at 7

107. See generally Pagiola, *supra* note 40, at 41

108. *Id.* at 41-42.

109. As discussed below, a significant amount of funding for the PSA program comes from international donors, including the World Bank.

ecosystem services noted in the Forestry Law. As noted above, these ecosystem services are:

Mitigation of gas emissions [leading to] the greenhouse effect (fixation, reduction, sequestration, storing and absorption);

Water protection for urban, rural or hydroelectric uses;

Protection of biodiversity for its conservation, sustainable, scientific and pharmaceutical uses; research and genetic improvement; protection of ecosystems and life forms; and

Natural scenic beauty for tourism and scientific purposes.¹¹⁰

Funding sources have been sought from beneficiaries from each of these services.

a. Mitigation of Greenhouse Gas

Various funding mechanisms have been created to receive payment from the beneficiaries from the mitigation of greenhouse gases. These have included the imposition of a fossil fuel tax, the international sale of carbon bonds, and carbon offset payments. Of these, the fossil fuel tax has to date provided the majority of funding for the PSA program.¹¹¹ Since 2001, Costa Rica has charged a 3.5% tax on all fossil fuels sold. This translates into an inflow of approximately ten million dollars annually into the PSA fund. While significant, the money generated by the fossil fuel tax represents a lower figure than the sum originally envisioned in the 1996 Forestry Law, which created a 15% fossil fuel tax, with a third of all revenue generated from the tax presented to FONAFIFO.¹¹²

A second source in funding for the PSA program is generated through the international sale of carbon bonds and other carbon offsets. Initially, the government of Costa Rica placed a great deal of hope on such sales as a mechanism to finance the forestry fund. In 1997, this hope was realized when the government of Norway purchased \$2 million dollars worth of carbon bonds to offset 200,000 tons of Carbon Dioxide produced in the Scandinavian na-

110. FONAFIFO, *Environmental Services, Concept*, available at: http://www.fonafifo.com/paginas_english/environmental_services/sa_concepto.htm

111. Pagiola, *supra* note 6 at 3

112. Brockett & Gottfried, *supra* note 49, at 29

tion.¹¹³ Despite the hopes of Costa Rica, the Norway purchase has been the largest such transaction to date.¹¹⁴

The government of Costa Rica maintains hope that increased interest in global warming will only increase international desire for carbon offsets. Indeed, these hopes have been partially borne out through global commitments financed through the World Bank's BioCarbon Fund which is currently providing over 2 million dollars to finance reforestation and conservation of over 4,000 hectares of agricultural land in the Brunca region of Costa Rica.¹¹⁵

Further efforts have involved the sale of carbon services to private corporations. Examples include Tenaska, a Nebraska-based energy company which provided \$500,000 to the government of Costa Rica to offset the CO₂ produced by a power plant operating in Washington State¹¹⁶ Similarly, Italian company Lifegate recently purchased sizeable quantities of carbon services from the Costa Rican government.¹¹⁷ Most recently, FONAFIFO officials floated the idea that tourists visiting Costa Rica could contribute to the forestry fund through voluntarily opting to offset the carbon produced by their journeys.¹¹⁸ One airline operating in Costa Rica, Nature Air, is currently considering such a voluntary payment to offset carbon production.¹¹⁹ It is likely that similar purchases will proceed in the future providing further funding to the program.

b. Water Protection, Protection of Biodiversity, and Protection of Scenic Beauty

Costa Rican officials have also targeted beneficiaries of the other types of ecosystem services mentioned. These included, water protection, biodiversity protection, and the protection of scenic beauty. First, Officials have also sought to garner funding for the PSA program from those who benefit from the water protection offered by Costa Rican forests. Five types of beneficiaries of the water protection have been identified: hydroelectric power genera-

113. Id. at 30

114. Although, the Netherlands did purchase 334,000 dollars in carbon bonds in 1999. Id.

115. Jorge M. Rodriguez, FONAFIFO, *Carbon Sequestration in Small and Medium Farms in the Brunca Region, Costa Rica*. Available online at <http://carbonfinance.org/docs/FONAFIFO-COOPEAGRI.pdf>.

116. Laura Tangle & Doug Fine, *Rainforests for Profit: Businesses Sell Nuts, Tourism, and 'Carbon Storage'* U.S. NEWS AND WORLD REPORT, Apr. 20, 1998, at 40.

117. Pagiola supra note 6 at 6.

118. Alejandra Vargas M., *Pais quiere ser primera nacion con balance neutron de carbono*, LA NACION, 21 de febrero 2007, available at http://www.nacion.com/ln_ee/2007/febrero/21/aldea1002694.html

119. Id.

tors, municipal water supply systems, irrigation systems, industrial users, and inhabitants of flood zones.¹²⁰ Of these, Hydroelectric producers have historically been the most involved in payment into the forestry fund.¹²¹ However, newer programs have sought a wider array of water beneficiaries. In 2005, Costa Rican officials announced a new water tariff program targeting water users throughout the country.¹²² When fully operational, the program will generate over four million dollars annually for the PSA program.¹²³

Reaching the beneficiaries of biodiversity services and scenic beauty has been more difficult. Domestic programs targeting ecotourism and other beneficiaries have to date not borne fruit.¹²⁴ However, the World Bank and the Global Environmental Facility have donated approximately 18 million dollars to FONAFIFO to carry out conservation activities which benefit biodiversity.¹²⁵ These payments in many ways appear to compensate Costa Rica for the biodiversity Costa Rican forests provide to sustaining global biodiversity.¹²⁶

V. THE COSTA RICAN PES PROGRAM ANALYZED

A. Participation and Increased Forest Cover

In the years since its creation, demand for enrollment in the PSA has been constant. Between 1997 and 2001, the program had enrolled more than 284,000 hectares of land—over five percent of total national territory.¹²⁷ Since that time, participation has steadily increased. By 2006, the PSA program had enrolled 532,668 hectares of land through contracts with over 6000 landowners (or collectives of landowners).¹²⁸ This amount totals approximately 10 percent of national area. Table 1 shows the steady increase in PSA program participation since 1997.

120. Pagiola, *supra* note 40 at 47

121. *Id.*

122. Pagiola *supra* note 6 at 4-5

123. *Id.*

124. Pagiola, *supra* note 6, at 6

125. *Id.* at 5

126. *Id.*

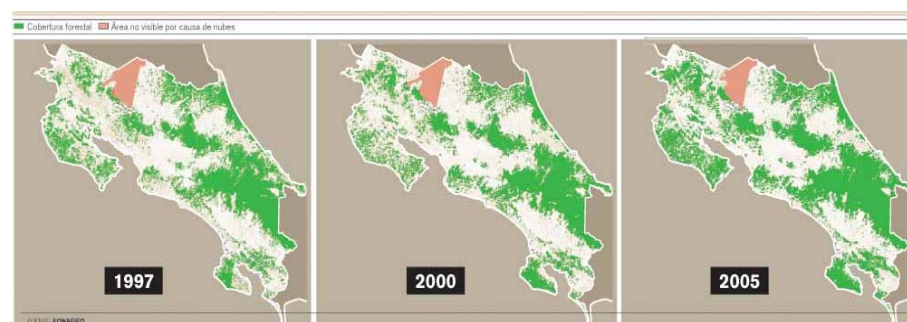
127. Zbinden & Lee *supra* note 94 at 258.

128. FONAFIFO *Distribución de las hectáreas y árboles contratadas en Pago de Servicios Ambientales, por año y por modalidad en el periodo 1997-2006*, 2006, available at: http://www.fonafifo.com/text_files/servicios_ambientales/distrib_ha_Contratadas.pdf

Table 1 PSA Hectares and Contracts by Year¹²⁹

<u>Year</u>	<u>Hectares Added</u>	<u>Number of Contracts</u>
1997	102,784	1,200
1998	59,916	597
1999	64,781	622
2000	29,040	271
2001	27,907	297
2002	24,904	279
2003	68,765	672
2004	72,638	760
2005	57,095	755
2006	24,838	619
Total	532,668	6,062

In addition to the actual enrollment figures into the program, there are other indicators that the PSA program has had a positive impact on Costa Rican forests. One metric testifying of the success of the PSA program is the changing degree of forested area in the country. Satellite imagery has consistently shown an increase in forest cover on private land since the creation of the PSA program.¹³⁰ This increase in forest cover can be seen in the darker areas represented in Figure 2 below.¹³¹

**Figure 2—Satellite Imagery Showing Increase in Forest Cover¹³²**

129. Id.

130. Estaban Oviedo, Pais recupera bosque perdido, La Nacion, 30 de Noviembre, 2006. Available at: http://www.nacion.com/ln_ee/2006/noviembre/30/pais913190.html

131. Although, clearly the satellite images also capture forest cover changes which may be occurring on public as well as private lands.

132. LA NACION, *Crecimiento del area Boscosa*, 30 de Noviembre 2006 Available at:

The most recent satellite imagery indicates that between 1997 and 2006, overall forest cover throughout Costa Rica had increased by over ten percent.¹³³ Areas around Guanacaste, the northern Caribbean, and some areas in the southern parts of the nation increased forest cover by proportionally larger amounts.¹³⁴ For instance, forest cover in the province of Guanacaste, located in the Northwest portions of the country had increased by eighteen percent.¹³⁵

B. Potential Issues and Future Directions

While it is clear that current trends in Costa Rica are garnering environmental benefits, understanding the causes leading to those trends is somewhat more difficult. Recent academic efforts have found that lands enrolled in the PSA program have larger forested areas than lands not participating in the programs.¹³⁶ However, it is unclear how much this aspect has resulted from self-selection bias—where those who are most interested in conservation, may already be conserving.¹³⁷

Further evidence suggests that different types of individuals are attracted to the program, testifying that it has not produced uniform incentives. In summing up some of the differences observed between program participants and non-participants, Zbinden and Lee state, “three major influences appear to determine participation in Costa Rica’s PSA program: farm size, human capital and economic factors, and information.”¹³⁸ Of these, farm size and human capital and economic factors may prove difficult for the program.

As for farm size, those with large landholdings were more interested in participating in the PSA program. With regard to hu-

http://www.nacion.com/ln_ee/2006/noviembre/30/crecimiento.jpg

133. Oviedo *supra* note 119

134. *Id.*

135. It should be noted that this reforestation figure accounts for reforestation which occurred over a 20 year period. Alejandra Vargas M., *Guanacaste recupero 18% de bosque en 20 años*, LA NACION, 6 de mayo 2006. Available at http://www.nacion.com/ln_ee/2006/mayo/06/aldea1.html

136. See eg. Zbinden & Lee, *supra* note 94 at 265 and Rodrigo Sierra and Eric Russman, *On the efficiency of environmental service payments: A forest conservation assessment in the Osa Peninsula, Costa Rica*, 138 59 *ECOLOGICAL ECONOMICS* 131 (2006).

137. For instance, Ortiz et al. found that a portion of their survey respondents stated that they would have conserved their land with or without the PSA program. See Edgar Ortiz Malavasi, et. al. *Impacto del Programa de Pago de Servicios Ambientales en Costa Rica como medio de reduccion de la pobreza en los medios rurales*, RUTA, available at http://www.ruta.org/admin/biblioteca/documentos/ImpactoProg_PagoServAmbientales.pdf

138. Zbinden & Lee *supra* note 94 at 269

man capital and other economic factors, participants relied on non farming income for the majority of their income, were more highly educated, and employed more intensive agricultural mechanisms on their property when they farmed. One potential implication of the Zbinden and Lee study is that the PSA program was only entered by those who could afford to. In other words, the program did not appeal to smaller landowners or those who relied on their properties for the principle source of income. The incentive program simply provided too little incentive.

Other studies have called into question the effectiveness of the PSA program in effectively changing existing land use patterns. One such study in the Osa Peninsula found little evidence that the PSA program had induced changes in land use practices.¹³⁹ A second study found that the PSA payments were insufficient to alleviate poverty—one factor leading to deforestation in Costa Rica.¹⁴⁰

Moreover, the PSA program has been implemented at the same time as a series of other changes in Costa Rica. As noted, a variety of other regulatory means are in effect to limit environmental degradation. It is difficult to disentangle reforestation due to the PSA from reforestation due to these regulations.¹⁴¹ Furthermore, some of the most environmentally degrading practices, such as conversion for free range cattle production have become less economically profitable as a result of the regulations.¹⁴² The decline in beef cattle profitability has certainly contributed to the reforestation rates of areas around the country, including Guanacaste, which has experienced 18% forest regeneration in recent years.¹⁴³ It is difficult at this early stage to effectively gauge the stand-alone impact to the PSA program.¹⁴⁴

VI. THE LESSONS FROM COSTA RICA—CONCLUSIONS

Three lessons are contained in the Costa Rican case. These include: 1) Landowners often face insufficient incentives to maintain their property; 2) Government intervention (or other collective action intervention) can change the incentives driving the loss of eco-

139. Sierra & Russman *supra* note 136

140. Edgar Ortiz Malavasi, et. al. *Impacto del Programa de Pago de Servicios Ambientales en Costa Rica como medio de reduccion de la pobreza en los medios rurales*, RUTA, available at http://www.ruta.org/admin/biblioteca/documentos/ImpactoProg_PagoServAmbientales.pdf

141. Pagiola, *supra* note 6 at 10

142. Vargas M. *supra* note 135

143. *Id.*

144. Pagiola notes that a variety of studies have come to mixed results on this very question. See Pagiola *supra* note 6 at 8-11.

system services; and 3) Direct government payments for ecological services is a promising tool for changing the incentives driving ecosystem service loss, but cannot be viewed as a panacea for conservation. Each of these will be discussed below.

- 1) *Landowners may face incentives to use their property in ways which reduce the ecosystem services performed.*

Economic theory surmises that all things equal, individuals will face insufficient incentives to provide a public good. Ecosystem services as a public good are no exception. In seeking private benefits, landowners may undertake actions which reduce the ecosystem services performed on their land. The history of Costa Rica has borne this out. Landowners there long undertook land use practices to capitalize on private benefits. These private benefits, however, came at the cost to ecosystem services as forests were cleared. Figure 1 illustrates the reduction of Costa Rican forests through 1986. It is understood that rapid deforestation reduced the ecosystem services in Costa Rica.

- 2) *Government intervention (or other collective action intervention) including PES programs can alter the incentives driving the loss of ecosystem services.*

As stated above, economists assert that governmental intervention or other collective action can overcome the individual incentives leading to undersupply of public goods. In the case of ecosystem services, governmental intervention can change the incentive structure leading to the loss of ecosystem services and create incentives for increased production of ecosystem services. Governmental tools frequently used to facilitate production of ecosystem services include protected areas, regulations, and incentive programs. PES programs represent a newly popular tool to change the incentive structure.

Governmental intervention has effectively changed the incentive structure leading to the decline in ecosystem services in Costa Rica through the creation of protected areas, regulations, incentive programs. Over the last ten years, previous governmental efforts have been supplemented with a governmental PES system—the PSA program.

In the program, landowners who contract with the government to maintain land practices favorable to the continued production of or new generation of ecosystem services receive a direct payment from the government. In the time since its creation, the PSA pro-

gram has faced consistent demand from landowners wishing to enroll. Currently, approximately ten percent of the country is enrolled in the program.

To date, it is clear that the PSA program represents an interesting approach to encouraging forest conservation. In the ten years since the inception of the PSA program, the country has increased in forested land by approximately 10 percent. While it is unclear what percentage of the increase is directly attributable to the program, it stands to reason that payments for ecosystem services factors into the increase in forest cover.

Furthermore, even if the stand-alone impact is not fully understood, it is clear that Costa Rica has established a program whereby landowners can contract to preserve their land in promise of payment. Mechanisms have been established for monitoring and enforcement of contract obligations. Importantly, practices have been put in place to fund the program and meet governmental payment obligations. While these practices have not fully become self sufficient to date, Costa Rican officials have made changes to the program to attempt to innovatively fund the program. Also, in seeking funding, the officials have focused collection efforts on those individuals and organizations which benefit most from the ecosystem services provided by Costa Rican forests.

3) *Direct government payments for ecological services is a promising tool for changing the incentives driving ecosystem service loss, but cannot be viewed as a singular panacea for conservation.*

The PSA program appears to have contributed to giving incentives to landowners to engage in land use practices which promote the ecosystem services performed there. The Costa Rican case, however, also warrants some caution. As noted above, the singular impact of the PSA program remains unproven at this juncture. Indeed, it is clear that the incentives offered have been insufficient to change land use practices of certain groups of individuals.

Additionally, the Costa Rican case illustrates that governmental programs to pay for ecosystem services require significant governmental resources. These resources include infrastructure to monitor and enforce, make payments, and coordinate the contracting activities. These items have not been straightforward in Costa Rica, and have changed over the years in response to needs. The resources also include actual financial ability to make the payments as required by the program. Meeting the financial obligations undertaken has proved difficult. Today, the PSA program

could not meet its financial obligations without international help.

The overall lesson, then, is that governmental PES programs are a theoretically sound mechanism to encourage to the production of ecosystem services on private land, but can be difficult to implement. Caution is warranted in creating adequate incentives for targeted payment recipients. Care must also be taken to establish solid funding mechanisms and institutions to ensure that the program continues and is effective. Future research is needed to more clearly spell out how these challenges can be overcome.