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## A Sea of Change to Change the Sea: Stopping the Spread of the Pacific Garbage Patch with Small-Scale Environmental Legislation

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# NOTE

## A SEA CHANGE TO CHANGE THE SEA: STOPPING THE SPREAD OF THE PACIFIC GARBAGE PATCH WITH SMALL-SCALE ENVIRONMENTAL LEGISLATION

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## INTRODUCTION

*The last fallen mahogany would lie perceptibly  
on the landscape, and the last black rhino would be  
obvious in its loneliness, but a marine species  
may disappear beneath the waves unobserved  
and the sea would seem to roll on the same as always.*<sup>1</sup>

*I want to say one word to you. Just one word .... Plastics.*<sup>2</sup>

Swirling masses of plastic spanning hundreds of miles lurk just beneath the surface of the Pacific Ocean.<sup>3</sup> These ever-increasing plastic masses are tangible reminders of the oft-forgotten consequences of using disposable plastic. As plastic use has steadily increased in the past century, the northern Pacific Ocean has begun to resemble a giant aquatic garbage can.<sup>4</sup> Estimates of the size of this Pacific “Garbage Patch” vary, but most researchers agree it is at least as large as the state of Texas.<sup>5</sup> Currently, there are no international treaties or federal laws that effectively combat this problem.<sup>6</sup> There *are*, however, smaller scale laws that have promise

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1. G. Carleton Ray, *Ecological Diversity in Coastal Zones and Oceans*, in BIODIVERSITY: PAPERS FROM THE NATIONAL FORUM ON BIODIVERSITY 36, 45 (E. O. Wilson & Frances M. Peter eds., 2003).

2. THE GRADUATE (Embassy Pictures Corp. 1968).

3. Justin Berton, *Floating Mass of Trash—Can It Be Cleaned Up?*, S.F. CHRON., Oct. 30, 2007, at A1.

4. *Id.*

5. See, e.g., JANE HETHERINGTON ET AL., THE MARINE DEBRIS RESEARCH, PREVENTION AND REDUCTION ACT: A POLICY ANALYSIS 8 (2005) (“Referred to as the eastern garbage patch, the area of debris is roughly the size of Texas and is located in the middle of the Pacific Ocean, near the northwestern Hawaiian Islands.”), <http://www.columbia.edu/cu/mpaenvironment/pages/projects/> (follow “sum2005” hyperlink; then follow second “Marine Debris Final” hyperlink); *Navigating the Pacific’s “Garbage Patch”* (NPR radio broadcast Oct. 28, 2007) (“[I]f the entire continental United States had a million plastic particles per square mile, how would you propose to remove that?”). But note that the director of the National Oceanic and Atmospheric Association’s (NOAA) marine debris program describes the Pacific Garbage Patch as a collection of “hot spots” and “cold spots” of debris, not a cohesive mass. *The News Hour* (PBS television broadcast Nov. 13, 2008) (interview with Spencer Michels).

6. See *The News Hour*, *supra* note 5 (“A few federal and state laws, plus some international treaties, have targeted marine debris, but enforcement has been difficult, and spotty, and largely ineffective. The U.S. government does have a few research studies

for stopping the spread of the Pacific Garbage Patch. Because national and international solutions for this problem are unlikely to arise in the near future, two laws in California—one regulating the use of tiny plastic pellets (“nurdles”),<sup>7</sup> and one banning plastic shopping bags—are the most viable legislative prototypes available today for stopping the tentacles of the Garbage Patch from creeping outward.

This Note will analyze legal and political concerns for policymakers looking to plug the regulatory gap through which plastic slips into the Pacific. Lawsuits and political controversy over plastic use have forced policymakers to assess both environmental and economic costs and benefits of restricting the use of this ubiquitous material. A complete lack of action is no longer an option, as the growing plastic problem in the Pacific adds more ballast every day to the environmental cost side of a policy analysis, indicating that the economic benefits of plastic use cannot long outweigh environmental costs and concerns. And as environmental issues gain more public attention, legislators often add moral factors to their cost-benefit analyses. An environmental moral imperative supports mandatory environmental protection measures when voluntary measures are inadequate, even in the face of economic counter-arguments.

A moral imperative compels people to act a certain way. The environmental moral imperative described in this Note compels people to protect and preserve the natural environment. Monetary savings from using plastic do not counteract the immorality of polluting the Pacific Ocean and robbing future generations of the benefits of a plastic-free ocean. Accordingly, mandatory plastic control measures are necessary to remedy the garbage problem in the commons of the Pacific. Regulations like California’s nurdle law are a valuable policy tool for industrial change, and bans on plastic bags are a viable option for change on the consumer side. Such mandatory environmental measures would promote an appropriate sea

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underway, and they are encouraging voluntary beach cleanup. But the funding has been modest, at least thus far.”).

7. AMRF/ORV Alguita Projects, What’s a Nurdle?, <http://www.alguita.com/feature.html> (last visited Feb. 22, 2010) (“Nurdles are plastic resin pellets that represent the most economical way to ship large quantities of a solid material, that is, in a pelletized form.”).

change in the American environmental mindset; one that could, in turn, change the plastic-ridden sea.

## I. THE PROBLEM

### A. *Plastic, Plastic Everywhere*

The average American sees a parade of plastic products everyday and uses hundreds of pounds of plastic every year.<sup>8</sup> After being discarded, plastic often takes decades, even centuries to biodegrade,<sup>9</sup> and only 5 percent of plastics are ever recycled.<sup>10</sup> Downsides of using this nonbiodegradable material are tangible in the Pacific Ocean. In the Pacific Garbage Patch, there are roughly six pounds of plastic for every pound of naturally occurring organic matter.<sup>11</sup> Cleaning up the plastic would be a task of gargantuan, and likely impossible, proportions.<sup>12</sup>

Reducing the influx of plastic is important, however, because the Pacific Garbage Patch negatively affects animals living in and near the Patch. For example, sea animals often mistake plastics for food.<sup>13</sup> Worldwide, 86 percent of sea turtle species, 44 percent of sea bird species, and 43 percent of marine mammal species are prone to

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8. The average American used 223 pounds of plastic in 2001 and likely will use 326 pounds yearly by 2010. Kenneth R. Weiss, *Altered Oceans: Plague of Plastic Chokes the Seas*, L.A. TIMES, Aug. 2, 2006, at A1.

9. Plastics take even longer to breakdown in seawater than on land. Cool seawater and ultraviolet ray-blocking seaweed act as preservatives. In fact, every piece of plastic manufactured in the past fifty years that has been left in an ocean is still there. *Id.*

10. Algalita Marine Research Foundation, Pelagic Plastics, [http://www.algalita.org/pelagic\\_plastic.html](http://www.algalita.org/pelagic_plastic.html) (last visited Feb. 16, 2010).

11. *Interview with Captain Charles Moore* (KGO TV-ABC broadcast Nov. 12, 2002).

12. Captain Charles Moore, founder of the Algalita Marine Research Foundation, has spent the past decade conducting surveys of plastic marine debris across the northern Pacific. Moore published a survey of marine debris in 1999, reporting six times more plastic by weight than zoo plankton. He expressed doubt that the Pacific Garbage Patch could ever be cleaned up. Algalita Marine Research Foundation, Biography of Captain Charles Moore, [http://www.algalita.org/charles\\_bio.html](http://www.algalita.org/charles_bio.html) (last visited Feb. 16, 2010); *see also* Berton, *supra* note 3. For background on the Foundation, see Algalita Marine Research Foundation, About Us, <http://www.algalita.org/about-us.html> (last visited Feb. 16, 2010).

13. Lorena Rios et al., *Persistent Organic Pollutants Carried by Synthetic Polymers in the Ocean Environment*, 54 MARINE POLLUTION BULL. 1230, 1236 (2007).

ingesting marine plastic.<sup>14</sup> The aquatic plastic refuse has health implications for humans as well. Plastics release chemical additives, pesticides, and other pollutants into the tissues of marine organisms and the ocean itself. These substances then find their way up the food chain into the human diet.<sup>15</sup>

Most of the plastic in the Pacific Garbage Patch comes from land, not ships.<sup>16</sup> A sampling of the waste might include: diapers, six-pack rings, beverage bottles, fishing gear, and plastic bags.<sup>17</sup> This chunky debris is surrounded by nurdles: tiny pellets of preproduction plastic.<sup>18</sup> American manufacturers produce billions of pounds of nurdles every year, releasing many into the world's waterways during transport, packaging, and processing.<sup>19</sup> Because no single land-based consumer or producer of plastic owns the oceans, those who make and use plastic on land have little motivation to pay attention to what happens to that plastic in the sea.

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14. Jose G.B. Derraik, *The Pollution of the Marine Environment by Plastic Debris: A Review*, 44 MARINE POLLUTION BULL. 842, 844 (2002).

15. Thomas M. Kostigen, *The World's Largest Dump: The Great Pacific Garbage Patch*, DISCOVER MAG., July 10, 2008, <http://discovermagazine.com/2008/jul/10-the-worlds-largest-dump>.

16. See DAUD HASSAN, PROTECTING THE MARINE ENVIRONMENT FROM LAND-BASED SOURCES OF POLLUTION 15 (2006) (“[Land based sources of marine pollution] constitute 77 percent of marine pollution.”); ELIZABETH MACMILLAN, ASSEMBLY COMMITTEE ON NATURAL RESOURCES, BILL ANALYSIS OF AB 258, at 4 (2007), available at [http://info.sen.ca.gov/pub/07-08/bill/asm/ab\\_0251-0300/ab\\_258\\_cfa\\_20070413\\_112446\\_asm\\_comm.html](http://info.sen.ca.gov/pub/07-08/bill/asm/ab_0251-0300/ab_258_cfa_20070413_112446_asm_comm.html) (“Land based litter constitutes nearly 80% of the marine debris found on our beaches and oceans, and 90% of it is plastic.”); *The News Hour*, *supra* note 5 (“[W]ater is picking up whatever is in the street, whether it’s leaves, debris, like plastic bags, and we’re collecting it [in water runoff treatment and recycling plants].”).

17. See HETHERINGTON ET AL., *supra* note 5, at 8 (“The sheer amount and dispersal range of marine debris is daunting: 14 billion pounds of garbage is dumped annually into the oceans and travels across the globe.”).

18. Weiss, *supra* note 8 (“From his river sampling, [Captain Charles Moore] estimated that 236 million pellets washed down the Los Angeles and San Gabriel rivers in three days’ time. Also known as ‘nurdles’ or mermaid tears, they are the most widely seen plastic debris around the world.”).

19. Katherine Ellison, *The Trouble with Nurdles*, 5 FRONTIERS ECOLOGY & ENV’T 396 (2007); Berton, *supra* note 3.

*B. Tragedy of the Commons*

The Pacific Garbage Patch is a “tragedy of the commons” problem.<sup>20</sup> Many actors, working without a shared mission of preservation, have built up waste in a common area: the Pacific Ocean. When a person discards a plastic bag on land, or a shipping company accidentally loses part of a shipment of nurdles, those plastic articles easily can wash down a sewer drain or blow out to sea.<sup>21</sup> Individual consumers and manufacturers do not directly bear the costs of the negative externalities that result from plastic escaping into the sea. They do, however, realize benefits from plastic consumption,<sup>22</sup> such as convenient transportation of the perfect shoes from counter to car, or sanitary clean up after the daily canine constitutional. As long as the beneficiaries of plastic use need not pay for the negative externalities associated with that plastic, the Pacific Garbage Patch problem will continue.

The challenges to solving this tragedy of the Pacific commons are similar to those facing policymakers attempting to combat climate change. No single legal regime holds the regulatory and enforcement power necessary to address the causes and harms of climate change.<sup>23</sup> Just as there is no international framework that holds individual actors responsible for climate change, there is no international obligation for nations to compensate an injured party

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20. See generally William W. Buzbee, *Recognizing the Regulatory Commons: A Theory of Regulatory Gaps*, 89 IOWA L. REV. 1, 4 (2003) (“[M]any social ills, particularly in connection with natural resources, are attributed to the ‘tragedy of the commons.’ Here, a resource controlled or owned by no one is portrayed as vulnerable to overuse by individually rational actors collectively creating destruction in no one’s long term interest, to the ultimate ruin of the resource. Absent derivation of some cooperative mechanism by those threatening the commons resource, or a cure from ‘the state,’ individually rational users will overtax the resource.”).

21. See JENNA JAMBECK ET AL., A SURVEY OF MARINE DEBRIS MANAGEMENT AND RESEARCH 3 (2001), available at [http://www.crrc.unh.edu/marine-debris/awma\\_paper.pdf](http://www.crrc.unh.edu/marine-debris/awma_paper.pdf).

22. Adam Akullian et al., *Plastic Bag Externalities and Policy in Rhode Island*, 3 ROOSEVELT REV. 9 (2007).

23. See Buzbee, *supra* note 20, at 13. The lack of a single global environmental body does not prevent countries from tackling global environmental problems through multilateral treaties. In the 1980s, an international coalition agreed to eliminate the use of chemicals that depleted the ozone layer. See *North America Backs Islands’ Effort To Use Ozone Treaty To Cut Greenhouse Gases*, HAMILTON SPECTATOR, Sept. 17, 2009, at 61.

for damage incurred from land-based marine pollution.<sup>24</sup> Because no one nation has regulatory authority over or liability for waste problems in the Pacific Ocean, nations lack motivation to solve the problem alone.<sup>25</sup> There is consequently no international minimum threshold setting an unacceptable level of land-based marine pollution: no canary in the aquatic coal mine. Despite the lack of a single legal body with the power, motivation, or inclination to create laws that would solve the Pacific Garbage Patch problem, there are a myriad of smaller scale policies that tangentially address this issue. None of these policies has been sufficient to tackle the patch problem seriously, but these piecemeal attempts are worth examining as potential springboards for future efforts.

## II. REGULATORY STATUS QUO

International, national, state, and local laws implicate marine debris, both directly and indirectly.<sup>26</sup> A survey of these laws reveals potentially effective approaches to deal with plastic marine debris, but no silver bullet.<sup>27</sup>

### A. *International Agreements*

Because marine debris drifts across political boundaries, local, state, and national legislation can offer only partial solutions to the garbage problem in the Pacific.<sup>28</sup> In theory, a targeted international agreement would be the best remedy for this problem, but no such agreement exists. Several international agreements mention marine

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24. HASSAN, *supra* note 16, at 187.

25. See generally BRIAN D. SMITH, STATE RESPONSIBILITY AND THE MARINE ENVIRONMENT (1988).

26. INTERAGENCY MARINE DEBRIS COORDINATING COMM., INTERAGENCY REPORT ON MARINE DEBRIS: SOURCES, IMPACTS, STRATEGIES & RECOMMENDATIONS 13 (2008), available at <http://marinedebris.noaa.gov/about/pdfs/imdcreport.pdf>.

27. For extensive background on legislative treatment of marine debris issues, see generally COMM. ON THE EFFECTIVENESS OF INT'L & NAT'L MEASURES TO PREVENT & REDUCE MARINE DEBRIS & ITS IMPACTS, NAT'L RESEARCH COUNCIL, TACKLING MARINE DEBRIS IN THE 21ST CENTURY (2008) [hereinafter TACKLING MARINE DEBRIS].

28. See HASSAN, *supra* note 16, at 11-12 (“[A]lthough local action and solutions are the priority, there is a necessity of a global regime to effectively control [land-based sources of marine pollution.]”); HETHERINGTON ET AL., *supra* note 5, at 28.

debris, but none have the force required to curb the flow of plastic from land to sea. Existing treaties and conventions generally have inadequate dispute resolution mechanisms, inadequate economic instruments, and inadequate provisions for liability.<sup>29</sup>

The United Nations Convention on the Law of the Sea<sup>30</sup> (UNCLOS) is the only global treaty that specifically deals with land-based sources of marine debris.<sup>31</sup> UNCLOS falls short as a tool for improving ocean conditions in the northern Pacific for two reasons: the Pacific Garbage Patch is beyond any national water sovereignty line established in the treaty, and the treaty's provisions on marine debris are too vague to facilitate a comprehensive solution. UNCLOS established boundaries in the world's oceans, giving nations political sovereignty over waters within twelve miles of their shorelines.<sup>32</sup> Up to 200 miles from their shores, signatory nations have jurisdiction to protect and preserve their marine environments.<sup>33</sup> Even though the United States has not ratified UNCLOS,<sup>34</sup> it recognizes the same mile markers of sovereignty.<sup>35</sup> These marine sovereignty boundaries solidify the tragedy of the commons problem in the Pacific Garbage Patch. The patch is too far off any coast for a nation to use its 200-mile environmental protection authority to enforce a national law in this area.<sup>36</sup>

Secondly, UNCLOS is not a powerful tool for combating the Pacific Garbage Patch because it is essentially a "bare framework"

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29. HASSAN, *supra* note 16, at 6.

30. United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter UNCLOS].

31. HASSAN, *supra* note 16, at 3. There *are* international frameworks that deal with ocean pollution in general. *Id.* at 5.

32. UNCLOS, *supra* note 30, art. 3.

33. *Id.* arts. 56-57.

34. Status of the United Nations Convention of the Law of the Sea, [http://www.un.org/Depts/los/general\\_assembly/general\\_assembly\\_reports.htm](http://www.un.org/Depts/los/general_assembly/general_assembly_reports.htm) (last visited Feb. 16, 2010); *see also* Citizens for Global Solutions, Ratifying the United Nations Convention on the Law of the Sea, <http://www.globalsolutions.org/issues/unclos> (last visited Feb. 16, 2010).

35. *See* Robin Kundis Craig, *Taking the Long View of Ocean Ecosystems: Historical Science, Marine Restoration, and the Oceans Act of 2000*, 29 *ECOLOGY L.Q.* 649, 659 (2002).

36. The northern Pacific convergence zone is roughly 800 miles west of San Francisco. Donovan Hohn, *Sea of Trash*, *N.Y. TIMES*, June 22, 2008 (Magazine), at 41, 43; *see also* Berton, *supra* note 3 (describing the Pacific Garbage Patch as swirling "in a convergence zone located about 30 to 40 degrees north latitude and 135 to 145 west longitude").

for protecting the marine environment.<sup>37</sup> It does not have specific, binding provisions for reducing current levels of land-based marine debris in the ocean.<sup>38</sup> Article 207 of the treaty requires signatory states (of which the United States is not a member) to “adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources, including rivers, estuaries, pipelines and outfall structures.”<sup>39</sup> The only further guidance UNCLOS offers is that “[l]aws, regulations, measures, rules, standards and recommended practices ... shall include those designed to minimize, to the fullest extent possible, the release of toxic, harmful or noxious substances, especially those which are persistent, into the marine environment.”<sup>40</sup> UNCLOS thus set laudable goals for signatory nations, but created no specific policies to achieve those goals, and has not prompted effective legislation in this area.

Other international agreements also mention land-based marine debris without constructing effective policy frameworks for stopping its spread. After UNCLOS, the UN continued discussion of marine debris at the 1992 United Nations Conference on Environment and Development, eventually creating a document that called for states to “take action at the national level, and, where appropriate, at the regional and subregional levels” in order to stop marine degradation.<sup>41</sup> Again, international actors set a broad goal without implementing specific methods to curb plastic use. After further meetings, these same actors made several nonbinding international declarations, specifically calling on nations to reduce land-based sources of pollution. The Washington Declaration on Protection of the Marine Environment from Land-Based Activities<sup>42</sup> and the

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37. HASSAN, *supra* note 16, at 5 (“The Convention does not go into detail, set international standards, or resolve relevant questions in relation to marine environment protection from [land-based sources].”).

38. *Id.*

39. UNCLOS, *supra* note 30, art. 207(1).

40. *Id.* art. 207(5).

41. Conference on Environment and Development, Rio de Janeiro, Braz., June 3-14, 1992, *Agenda 21*, ch. 17-24, U.N. Doc. A/CONF. 151/26 (Vol. I) (Aug. 12, 1992).

42. Intergovernmental Conference To Adopt a Global Programme of Action for the Protection of the Marine Environment from Land Based Activities, Wash., D.C., Oct. 23-Nov. 3, 1995, *Washington Declaration on Protection of the Marine Environment from Land-Based Activities* (Nov. 1, 1995), available at [http://www.gpa.unep.org/documents/washington\\_](http://www.gpa.unep.org/documents/washington_)

Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities<sup>43</sup> both came out of a conference held in Washington, D.C. in 1995. Both specifically address land-based marine pollution, but neither is binding, and neither has been fully implemented.<sup>44</sup>

### *B. Federal Laws*

Several federal laws directly address marine debris, but none involve explicit regulatory authority for land-based marine debris.<sup>45</sup> However, “federal authority does exist for regulating certain items that *may be or have the potential to become* marine debris.”<sup>46</sup> For example, the Rivers and Harbors Appropriation Act of 1899<sup>47</sup> prohibits discharging waste from shores and wharfs, among other areas, into any navigable water or one of its tributaries.<sup>48</sup> Other federal laws relevant to marine debris either include regulatory authority for an agency to act without specifically charging the agency to work on marine debris or explicitly mention marine debris without giving an agency regulatory authority.

In addition to the Rivers and Harbors Act, the Clean Water Act (CWA),<sup>49</sup> the Resource Conservation and Recovery Act (RCRA),<sup>50</sup> and the Pollution Prevention Act of 1990 (PPA)<sup>51</sup> all have provisions potentially applicable to marine debris. The CWA requires the Environmental Protection Agency (EPA) to support state and local programs that monitor floatable material in order to protect public

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declaration\_english.pdf.

43. Intergovernmental Conference To Adopt a Global Programme of Action for the Protection of the Marine Environment from Land Based Activities, Wash., D.C., Oct. 23-Nov. 3, 1995, *Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities*, U.N. Doc. UNEP (OCA)/LBA/IG.2/7 (Dec. 5, 1995), available at [http://www.gpa.unep.org/documents/full\\_text\\_of\\_the\\_english.pdf](http://www.gpa.unep.org/documents/full_text_of_the_english.pdf).

44. See HASSAN, *supra* note 16, at 100.

45. INTERAGENCY MARINE DEBRIS COORDINATING COMM., *supra* note 26, at 34.

46. *Id.* (emphasis added).

47. Rivers and Harbors Appropriation Act, ch. 425, 30 Stat. 1121 (1899) (codified as amended in scattered sections of 33 U.S.C.).

48. 33 U.S.C. § 407 (2006).

49. *Id.* §§ 1251-1385.

50. 42 U.S.C. §§ 6901-6992k (2006).

51. *Id.* §§ 13101-13109.

health and safety in “coastal recreation waters.”<sup>52</sup> The CWA only applies in this context to the Great Lakes and waters that a state designates for “swimming, bathing, surfing, or similar water contact activities.”<sup>53</sup> The CWA also sets out permit requirements for discharges into waters up to 200 miles from United States shores.<sup>54</sup> The RCRA authorizes the EPA to encourage, cooperate with, and give financial assistance to “appropriate public (whether federal, state, interstate, or local) authorities, agencies, and institutions,” as well as private institutions and individuals, in order to study “adverse health and welfare effects of the release into the environment of material present in solid waste, and methods to eliminate such effects.”<sup>55</sup> The PPA declares a national policy that pollution “should be prevented or reduced at the source whenever feasible,” and that “disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.”<sup>56</sup> Together, the CWA, the RCRA, and the PPA do not specifically target marine debris, but they do contain standards potentially applicable to land-based marine debris.<sup>57</sup> Other federal laws that do not explicitly mention marine debris but do grant agencies regulatory authority include the Shore Protection

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52. 33 U.S.C. § 1346(f) (2006). “Floatable material” is “any foreign matter that may float or remain suspended in the water column.” *Id.* § 1362(22)(A). The CWA has more general provisions on monitoring waters for pathogens. *See id.* § 1346(a)(1)(A) (“[T]he Administrator shall publish performance criteria for ... monitoring and assessment ... of coastal recreation waters ... for pathogens and pathogen indicators.”).

53. *Id.* § 1362(21)(A).

54. *Id.* § 1342(a)(1) (“[T]he Administrator may ... issue a permit for the discharge of any pollutant.”); *see also id.* § 1343(c) (“The Administrator shall ... promulgate guidelines for determining the degradation of the waters of the territorial seas, the contiguous zone, and the oceans.”); Proclamation No. 7219, 64 Fed. Reg. 48,701 (Aug. 2, 1999) (“The contiguous zone of the United States extends to 24 nautical miles from the baselines of the United States determined in accordance with international law, but in no case within the territorial sea of another nation.”); Craig, *supra* note 35, at 660 n.66 (“Although the Act defines the ‘ocean’ to be ‘any portion of the high seas beyond the contiguous zone,’ the United States lacks the power under international law to regulate beyond the 200-mile [Exclusive Economic Zone]. Therefore ... the Clean Water Act’s ‘ocean’ stretches from the outer boundary of the contiguous zone (12 miles out under the original United Nations Convention on the Law of the Sea, 24 miles under the treaty resulting from UNCLOS III) out to 200 miles offshore.” (citations omitted)).

55. 42 U.S.C. § 6981(a)(1) (2006).

56. *Id.* § 13101(b).

57. INTERAGENCY MARINE DEBRIS COORDINATING COMM., *supra* note 26, at 35.

Act,<sup>58</sup> the Outer Continental Shelf Lands Act,<sup>59</sup> and the National Marine Sanctuaries Act.<sup>60</sup>

Two laws explicitly refer to marine debris but are not designed to stop the flow of plastic from land to sea. The Marine Protection, Research and Sanctuaries Act declared that Congress would regulate dumping of all materials into ocean waters, especially materials that adversely affect human health, the marine environment, ecological systems, or “economic potentialities.”<sup>61</sup> This Act focuses on materials that are purposefully transported to an ocean and left there, as opposed to materials that find their way into the ocean via wind or river flow.<sup>62</sup> The Coastal Zone Management Act of 1972<sup>63</sup> directly mentions marine debris but does not grant any federal agency regulatory authority. The Act only allows the Secretary of Commerce to authorize grants to coastal states for programs that aim to reduce marine debris “by managing uses and activities that contribute to the entry of such debris.”<sup>64</sup> The lack of overlap between specific mentions of marine debris and federal regulatory authority creates a regulatory gap through which land-based plastic can escape into the ocean.

This plethora of legislation on marine debris demonstrates that a tangled legal mess cannot fix a tangled marine mess. The National Resource Council (NRC) reported in 2008 that despite Congress’s effort to “charge[] federal agencies with addressing the marine

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58. 33 U.S.C. §§ 2601-2609 (2006); *id.* §2603(b)(1) (“The [EPA], in consultation with the Secretary of Transportation, shall prescribe regulations requiring that waste sources, receiving facilities, and vessels provide the means and facilities to assure that the waste will not be deposited into coastal waters during loading, offloading, and transport.”).

59. 43 U.S.C. §§ 1331-1356(a), 1801-1802, 1862-1866 (2006); *id.* § 1333(a)(1) (“The Constitution and laws and civil and political jurisdiction of the United States are extended to the subsoil and seabed of the outer Continental Shelf.”).

60. 16 U.S.C. §§ 1431-1445 (2006); *id.* §1436(1) (“It is unlawful for any person to destroy, cause the loss of, or injure any sanctuary resource.”); *id.* § 1432(8) (defining a “sanctuary resource” as “any living or nonliving resource of a national marine sanctuary that contributes to the conservation, recreational, ecological, historical, educational, cultural, archeological, scientific, or aesthetic value of the sanctuary”).

61. 35 U.S.C. § 1401(a) (2006).

62. Unless a person or vessel has a permit from the EPA, the Secretary of the Army, or the Secretary of the Coast Guard, that person or vessel may not “transport from the United States ... any material for the purpose of dumping it into ocean waters.” *Id.* § 1411.

63. 16 U.S.C. §§ 1451-1466 (2006).

64. *Id.* § 1456b(a)(4), (b)(1).

debris problem and ... [call] for interagency coordination, leadership and governance remain diffuse and ineffective.”<sup>65</sup> For example, no single agency or person heads federal efforts to combat marine debris.<sup>66</sup> The NRC further commented that “[i]t is not surprising that marine debris has not consistently received high priority given the complex framework of laws and agency responsibilities.”<sup>67</sup> To simplify this regulatory jumble, Congress tried to consolidate marine debris efforts in 1987.

The 1987 Marine Plastic Pollution Research and Control Act (MPPRCA) established the Interagency Marine Debris Coordinating Committee (IMDCC), requiring the IMDCC to coordinate marine debris research among federal agencies, nongovernmental organizations, universities, industries, states, Indian tribes, and other nations.<sup>68</sup> The Act also required the National Oceanic and Atmospheric Administration (NOAA), the EPA, and the Department of Transportation to conduct a joint public outreach program to educate members of the public about “the need to reduce the quantity of plastic debris in the marine environment.”<sup>69</sup> Since 1987, however, Congress has not made the IMDCC a high priority and the IMDCC has suffered from a lack of consistent funding.<sup>70</sup>

The Marine Debris Research, Prevention, and Reduction Act (MDRPA) of 2006 reactivated the IMDCC and called for the development of a “[f]ederal marine debris information clearinghouse.”<sup>71</sup> Reaffirming the need for its own existence in 2008, the IMDCC recommended that federal, state, and local actors increase coordination for effective efforts at curbing marine debris, because there is currently no “comprehensive understanding of all state authorities relating to marine debris and items that may become marine debris.”<sup>72</sup> Most of the requirements of the MDRPA are

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65. TACKLING MARINE DEBRIS, *supra* note 27, at 78.

66. *See id.* (“IMDCC or Congress should clearly designate a lead agency to expand cooperative marine debris programs, including ... land-based marine debris.”).

67. *Id.* at 77.

68. 33 U.S.C. § 1914(a) (2006).

69. *Id.* § 1915(a)(1)(D).

70. TACKLING MARINE DEBRIS, *supra* note 27, at 77.

71. 33 U.S.C. § 1951(2)-(3) (2006).

72. INTERAGENCY MARINE DEBRIS COORDINATING COMM., *supra* note 26, at 35. The MDRPA also established a marine debris program within NOAA “to reduce and prevent the occurrence and adverse impacts of marine debris on the marine environment and navigation

flexible, giving agencies wide latitude in determining how exactly to go about reducing marine debris.<sup>73</sup> The IMDCC's report demonstrated that the MDRPRA's measures have not yet resulted in a coordinated federal effort to reduce land-based marine debris.

### *C. State and Local Governments*

There is currently no consensus among state authorities on regulating land-based marine debris.<sup>74</sup> Some states have laws that restrict the release of debris into marine environments, such as litter fines, beach ordinances, and fees and prohibitions on items likely to become marine debris.<sup>75</sup> States and cities also conduct antilitter campaigns and sponsor clean up efforts.<sup>76</sup> State-based groups, sometimes even from landlocked states,<sup>77</sup> participate in shore cleanups, such as the International Coastal Cleanup (ICC).<sup>78</sup> In 2007, nearly 400,000 ICC volunteers picked up over six million pounds of beach debris across the globe.<sup>79</sup> These cleanups, although valuable, are reactive and not preemptive: cleanups focus on awareness, not solving the world's marine debris problem at its source.<sup>80</sup>

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safety." 33 U.S.C. § 1952(a) (2006). This mandate identifies the parties at which NOAA should aim its education and outreach programs, but does not set out specific methods for NOAA to increase awareness of marine debris issues. HETHERINGTON ET AL., *supra* note 5, at 21.

73. HETHERINGTON ET AL., *supra* note 5, at 17.

74. INTERAGENCY MARINE DEBRIS COORDINATING COMM., *supra* note 26, at 35.

75. *Id.*

76. Gainesville, Jacksonville, and St. Petersburg, Florida spent a total of \$5.5 million on clean ups, litter enforcement, and litter prevention in 1999. JAMBECK ET AL., *supra* note 21, at 6.

77. A group called Arizona Clean and Beautiful runs an adopt-a-shore program. *Id.* at 7.

78. See Ocean Conservancy, Ocean Conservancy's International Coastal Cleanup: A Single Effort Started a Sea Change, <http://www.oceanconservancy.org/site/News2?page=NewsArticle&id=10775> (last visited Feb. 16, 2010) (describing the ICC as a "worldwide movement ... with more than six million volunteers in 127 countries and all 55 U.S. states and territories over the last 23 years").

79. OCEAN CONSERVANCY, INTERNATIONAL COASTAL CLEANUP REPORT 3 (2007), available at [http://www.oceanconservancy.org/site/DocServer/ICC\\_AR07.pdf?docID=3741](http://www.oceanconservancy.org/site/DocServer/ICC_AR07.pdf?docID=3741).

80. Hohn, *supra* note 36, at 42 (quoting Seba Sheavly, marine-debris researcher and former head of the ICC).

States are free to legislate against marine debris on their own.<sup>81</sup> Given the lack of effective international and national policy in this area, state and local legislation offers a constructive avenue for finding solutions to the Pacific Garbage Patch problem. Even though a larger policy solution will ultimately be necessary, state and local governments have the power to initiate a push against plastic marine debris.

### III. SOLUTIONS

Plugging the regulatory gap through which plastic escapes into the Pacific Ocean will ultimately require an approach that is “local in scale and global in scope.”<sup>82</sup> The likelihood of global actors agreeing to implement a sufficiently aggressive treaty on land-based marine pollution is so low that local solutions must take priority in the short term.<sup>83</sup> This Note advocates two policy solutions on this smaller local scale: stricter regulations for industries that ship and use nurdles and restrictions on the use of certain types of consumer plastic bags. Industrial regulations like California’s nurdle law<sup>84</sup> are a necessary tool in the absence of effective voluntary programs. Plastic bag bans, though controversial, can reduce the amount of plastic in circulation<sup>85</sup> and are a better tool for the marine debris problem than conversion to biodegradables, voluntary recycling, and targeted taxes.<sup>86</sup> Although voluntary programs like industrial best management practices and bag recycling already exist, and similar programs that work to change attitudes about plastic use are important,<sup>87</sup> these measures are ultimately inadequate.

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81. See U.S. CONST. amend. X (delegating to states powers that the Constitution does not explicitly assign to the federal government).

82. INTERAGENCY MARINE DEBRIS COORDINATING COMM., *supra* note 26, at 14.

83. See *supra* Part II.A.

84. CAL. WATER CODE § 13367 (West 2009).

85. See MIRIAM GORDON, ELIMINATING LAND-BASED DISCHARGES OF MARINE DEBRIS IN CALIFORNIA: A PLAN OF ACTION FROM THE PLASTIC DEBRIS PROJECT, CAL. COASTAL COMMISSION 72 (2006), available at [http://www.plasticdebris.org/CA\\_Action\\_Plan\\_2006.pdf](http://www.plasticdebris.org/CA_Action_Plan_2006.pdf).

86. See *infra* Part III.B.1. But see Akullian et al., *supra* note 22, at 15 (analyzing the benefits of targeted taxes); Anne Barnard, *Council Votes for Recycling Plastic Bags*, N.Y. TIMES, Jan. 10, 2008, at B1; Shia Levitt, *Manufacturers Push Biodegradable Plastic Bags* (NPR radio broadcast Apr. 7, 2008).

87. See INTERAGENCY MARINE DEBRIS COORDINATING COMM., *supra* note 26, at 12 (“Successful prevention ... depends on changing attitudes and behavior which can be difficult

Stopping the spread of the Pacific Garbage Patch will require a sea change in industrial and consumer behavior, one that voluntary policies cannot provoke. This sea change is necessary because actions that exacerbate the Garbage Patch problem violate an environmental moral imperative: an imperative that directs us to consider more than the industrial or consumer convenience of the moment, to consider instead the value of the ocean to future generations. California acknowledged the need for mandatory plastic controls when it tightened its regulations on the use of nurdles.

*A. Nurdles—Tiny Pellets, Big Problem*

Nurdles are pellets of preproduction plastic.<sup>88</sup> They are an integral part of the inexpensive production process that makes plastic so accessible today.<sup>89</sup> In the United States alone, producers turn out about 120 billion pounds of nurdles per year.<sup>90</sup> Even the largest nurdles, only five millimeters across,<sup>91</sup> are too small for most American sewer systems to catch.<sup>92</sup> As nurdles find their way into oceans by washing down storm drains and blowing off of trains and trucks,<sup>93</sup> they become a major part of waste in the Pacific Garbage Patch.<sup>94</sup> Marine nurdles can choke sea animals and leach harmful chemicals into the water.<sup>95</sup>

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if the public and relevant stakeholders do not understand the links between their actions and marine debris.”)

88. See Rios et al., *supra* note 13, at 1230.

89. *Id.* (attributing the vast amount of plastic in the world today to “inexpensive production costs and the light weight and varied properties of plastics”).

90. Berton, *supra* note 3, at A1 (“The annual production of plastic resin in the United States has roughly doubled in the past 20 years, from nearly 60 billion pounds in 1987 to an estimated 120 billion pounds in 2007, according to a study by the American Chemistry Council, which represents the nation’s largest plastic and chemical manufacturers.”).

91. Ellison, *supra* note 19, at 396.

92. *Id.*

93. *Id.*

94. *Interview with Captain Charles Moore, supra* note 11 (“[Nurdles] are becoming the most common pollutant on our beaches. A three month study of Orange County beaches found three and a half million of these little plastic pellets.”).

95. JAMBECK ET AL., *supra* note 21, at 3 (“A more recently discovered problem with marine debris, particularly in plastic resins and pellets, is the transport of toxic chemicals in the marine environment. PCBs (Polychlorinated Biphenyls), DDE (Dichlorodiphenyldichloroethylene) and nonylphenols were detected in polypropylene pellets off the coast of Japan.” (footnote omitted)).

Plastics manufacturers have tried to address this problem. The Society of the Plastics Industry (SPI) and the American Chemistry Council (ACC) publicized a series of Best Management Practices under the name “Operation Clean Sweep” to encourage proper handling of nurdles.<sup>96</sup> These BMP suggestions included committing to making “zero pellet loss” a priority, auditing facilities for regulatory compliance, upgrading facilities, raising employee awareness and accountability, and following up with employees to maintain best practices in the future.<sup>97</sup> Operation Clean Sweep could be effective if adopted widely, but it is still a voluntary program, and according to the California legislature, many manufacturers do not follow its guidelines.<sup>98</sup> Interestingly, the IMDCC praised Operation Clean Sweep as “an effective example of industry best management practices,”<sup>99</sup> based on data received from the SPI and ACC.<sup>100</sup>

The State of California apparently disagreed with the SPI’s and the ACC’s assessment of the effectiveness of voluntary industrial measures. In 2007, California passed a law requiring companies that use nurdles to improve management techniques and decrease the amount of nurdles they release into the ocean.<sup>101</sup> This law included requirements for installing more effective screens in storm drains, improving coverings on plastic pellet containers, and

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96. CAL. S. RULES COMM., BILL ANALYSIS OF AB 258 4-5 (2007), available at [http://leginfo.ca.gov/pub/07-08/bill/asm/ab\\_0251-0300/ab\\_258\\_cfa\\_20070901\\_170845\\_sen\\_floor.html](http://leginfo.ca.gov/pub/07-08/bill/asm/ab_0251-0300/ab_258_cfa_20070901_170845_sen_floor.html); American Chemistry Council, Five Basic Steps for Management: Implementing Operation Clean Sweep, <http://www.opcleansweep.org/manual/implementingOCS.asp> (last visited Feb. 16, 2010) [hereinafter Five Basic Steps for Management]; American Chemistry Council, Operation Clean Sweep, <http://www.opcleansweep.org/overview/> (last visited Feb. 16, 2010).

97. Five Basic Steps for Management, *supra* note 96. For a list of companies that have pledged to follow Operation Clean Sweep, see Company Pledge To Prevent Resin Pellet Loss, <http://www.opcleansweep.org/companypledge/listpledges.asp> (last visited Feb. 16, 2010).

98. CAL. S. RULES COMM., *supra* note 96, at 5.

99. INTERAGENCY MARINE DEBRIS COORDINATING COMM., *supra* note 26, at 20.

100. *See id.* at 20, 58 (citing AM. CHEMISTRY COUNCIL & THE SOCIETY OF THE PLASTICS INDUS., OPERATION CLEAN SWEEP: PELLET HANDLING MANUAL 42 (2007), available at <http://www.opclean.sweep.org/manual/OCSmanual.pdf>).

101. *See* CAL. WATER CODE § 13367(b)(1) (West 2009) (“The state board and the regional boards shall implement a program to control discharges of preproduction plastic from point and nonpoint sources.”); *see also* CAL. S. RULES COMM., *supra* note 96, at 8 (“This bill will simply require all manufacturers of plastic products to use basic common sense housekeeping principles to control the discharge of nurdles. It evens the playing field of competition while protecting the oceans from irreparable harm.”).

introducing and improving vacuum clean up systems.<sup>102</sup> Opponents of this law argued that it would impose hidden taxes on California businesses, but the California legislature decided that the benefits of the program outweighed any associated costs.<sup>103</sup> In fact, the ACC supported California's nurdle law: "[W]e agree that even one piece of plastic in the ocean is too many .... In California last year, ACC worked with the state Legislature to enact a new state law ... that requires containment measures to reduce the release of plastic pellets into the marine environment."<sup>104</sup> California's nurdle law is a step in the right direction because it acknowledges that mandatory environmental measures are necessary and valuable when voluntary programs fall short.

Restrictions on nurdles are just one type of regulation that can help stop the flow of plastic into the Pacific when voluntary programs are insufficient. Voluntary programs have not made a substantial dent in consumer plastic use—a deficiency that mandatory plastic bag bans can remedy. Although the nurdle program went through the legislature with little fanfare,<sup>105</sup> similar measures in other parts of society, such as retail bag bans, will not be so easily enacted. For instance, policymakers attempting to pass bag bans have encountered opposition from the very same industry groups that did not oppose the nurdle law.<sup>106</sup> Even so, bans on plastic bags, like the nurdle law, are necessary to combat the Pacific Garbage Patch problem.

### *B. Plastic Bags*

The constant growth of the Pacific Garbage Patch indicates that some kind of land-based plastic regulatory scheme will be necessary

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102. CAL. S. RULES COMM., *supra* note 96, at 9.

103. The Stop Hidden Taxes Coalition objected to the provision of the law authorizing the State Water Quality Control Board to regulate the release of plastic pellets, arguing that this regulation would circumvent California's procedural requirements for creating new taxes. *Id.* at 9-10.

104. Press Release, Am. Chemistry Council, Chemistry Council Responds to Cal. Lieutenant Governor John Garamendi & Ocean Protection Council Report (July 25, 2008), available at <http://www.reuters.com/article/idUS17875+26-July-2008+PRN20080726>.

105. See Heal the Bay, Governor Schwarzenegger Signs AB 258, the "Nurdles Bill," (Oct. 18, 2007), [http://www.healthebay.org/news/2007/10\\_18\\_ab258signed/default.asp](http://www.healthebay.org/news/2007/10_18_ab258signed/default.asp).

106. See *infra* Part III.B.1.d.

to prevent a worsening of the garbage problem. Quantifying the individual impacts of different types of plastic debris in the Patch is difficult because of the sheer size of the problem, but bags definitely compose a large portion of the plastic that plagues the world's oceans and coasts.<sup>107</sup> In the 1999 ICC,<sup>108</sup> plastic bags made up 14 percent of the refuse volunteers collected on beaches around the world.<sup>109</sup> A cleanup of a catch basin in the Los Angeles River in 2004 yielded a pile of waste that was 43 percent plastic film and bags.<sup>110</sup>

Restrictions on plastic bags will be challenging because the bags are ubiquitous and useful.<sup>111</sup> Still, plastic bag recycling programs, taxes, and bans are becoming more popular each year around the world. Paris, Mexico City, Bangladesh, Ireland, South Africa, Rwanda, Taiwan, and China all either tax or completely ban plastic bags.<sup>112</sup> Converting to biodegradable plastics, introducing and funding recycling programs, and imposing targeted taxes would all be steps in the right direction for American lawmakers looking to make a positive environmental impact. For the Pacific Ocean debris problem, however, a ban is the best kind of regulatory measure.<sup>113</sup>

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107. ALGALITA MARINE RESEARCH FOUND., PLASTIC DEBRIS FROM RIVERS TO SEA, *available at* <http://www.algalita.org/pdf/PLASTIC%20DEBRIS%20ENGLISH.pdf> ("A large segment of what ends up as marine debris is single use disposable consumer items. A bottle cap or plastic bag that falls to the grounds will be blown or washed into a storm drain, where it will flow to the ocean.")

108. See JAMBECK ET AL., *supra* note 21, at 8.

109. *Id.* Plastic bags and food wrappers were the second most abundant type of waste in this cleanup. The first was cigarette filters, accounting for 22 percent of the waste collected. *Id.* at 11. Bags (14 percent) were followed closely by plastic pieces (11 percent), foam plastic pieces (9 percent), paper pieces (7 percent), glass pieces (7 percent), and various other plastic items, bottles, and lids. *Id.* This survey of debris, compiled from records kept by volunteers, does not follow strict scientific protocol, but it does provide a rough idea of the magnitude and nature of the plastic problem. *Id.* at 8.

110. GORDON, *supra* note 85, at 18.

111. Melissa Savage, *A Profusion of Plastic*, ST. LEGISLATURES MAG., May 2008, at 16, 16, *available at* [http://www.ncsl.org/magazine/articles/2008/08SLMay08\\_Plastic.htm](http://www.ncsl.org/magazine/articles/2008/08SLMay08_Plastic.htm) ("Despite the costs, plastic bag use is on the rise—in 1982 only 5 percent of shoppers used plastic bags compared to about 80 percent today.")

112. See Frank Convery et al., *The Most Popular Tax in Europe? Lessons from the Irish Plastic Bags Levy*, 38 ENVTL. & RESOURCE ECON. 1, 2-3 (2007); Charles Proctor, *Compostable Bags No Solution for L.A. Area*, L.A. TIMES, Apr. 10, 2007, at B1; Elisabeth Rosenthal, *With Irish Tax, Plastic Bags Go the Way of the Snakes*, N.Y. TIMES, Feb. 2, 2008, at A3; Elisabeth Malkin, *Unveiling a Plastic Bag Ban in Mexico City*, N.Y. TIMES GREEN INC. BLOG, Aug. 21, 2009, <http://greeninc.blogs.nytimes.com/2009/08/21/unveiling-a-plastic-bag-ban-in-mexico-city/>.

113. See *infra* Part III.B.1.e.

Bans on plastic bags are an admittedly extreme solution to the pollution problem, but extreme problems require extreme measures.

### 1. *Bans*

Banning nonbiodegradable, single-use plastic shopping bags is the most effective way to keep more bags from becoming part of the swirling vortex of trash in the Pacific Ocean.<sup>114</sup> Other countries bordering the Pacific are already running with this torch. For example, in 2008, the Chinese government banned plastic bags with a thickness under 0.025 millimeters and imposed a tax on thicker bags.<sup>115</sup> Though popular elsewhere, bans will not easily be enacted in the United States, where restrictions on consumer freedom are legally and politically thorny.

Cities and states that have banned bags have encountered strong opposition, at times from consumers and often from bag distributors and manufacturers.<sup>116</sup> Lawsuits have stopped some bans even before the bans took effect.<sup>117</sup> These suits usually employ a common argument: the governmental body enacting the ban failed to conduct an adequate environmental impact assessment because it failed to consider the adverse environmental impacts of paper bag use. A municipality that seeks to ban bags may thus be vulnerable to legal challenge, but as long as it complies with its state's procedural requirements for environmental regulation, it need only concern itself with proving that plastic is ultimately more harmful to the natural world than other disposable materials and that mandatory measures are therefore justified.

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114. In general, bans are useful when the very existence of a product is too dangerous to allow any use at all. See OFFICE OF TECH. ASSESSMENT, U.S. CONG., ENVIRONMENTAL POLICY TOOLS: A USER'S GUIDE 98 (1995) ("A product ban may be appropriate where product use is intrinsically sufficiently damaging that zero use is a desirable outcome.").

115. *China Bans Ultrathin Plastic Bags: Crackdown Focuses on 'White Pollution,'* INT'L HERALD TRIB., June 2, 2008, at 14.

116. See *infra* Part III.B.1.d.

117. See *infra* Part III.B.1.d.

*a. Rubric for Lawsuits*

Plastic bag bans have only been enacted on the local level in the United States. Consequently, there have been no lawsuits on this issue against the federal government, federal environmental laws provide a model of the types of state statutes that plaintiffs can use to challenge bag bans.

The National Environmental Policy Act of 1969<sup>118</sup> (NEPA) requires federal agencies to include an environmental impact statement in “every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment.”<sup>119</sup> This statement must include adverse environmental impacts of the proposed action and available alternatives to the proposed action.<sup>120</sup> State environmental laws often parallel these NEPA provisions. New York’s State Environmental Quality Review Act (SEQRA) and accompanying regulations require state agencies and local governments to prepare an impact statement when they undertake or fund an action that may have a significant adverse environmental impact.<sup>121</sup> Similarly, the California Environmental Quality Act (CEQA) requires California state agencies that regulate actions of private individuals to prepare reports identifying significant environmental impacts of proposed projects.<sup>122</sup> If a municipality bans bags without producing an adequate environmental impact assessment in states like New York and California, the decades-old paper versus plastic debate would give plaintiffs ample fodder for suing to invalidate the ban.

*b. Paper Versus Plastic*

When the plastic industry challenges a plastic bag regulation, its clarion call for plastic use usually highlights the environmental impacts of *paper* bag use. The “paper or plastic” debate has faded

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118. 42 U.S.C. §§ 4321-4347 (2006).

119. *Id.* § 4332(C).

120. *Id.* § 4332(C)(i)-(v).

121. N.Y. ENVTL. CONSERV. §3-0301(1)(b) (Consol. 2008); N.Y. COMP. CODES R. & REGS. tit. vi, § 617.1 (2009).

122. CAL. PUB. RES. CODE § 21002.1 (West 2007).

somewhat as reusable bags have become more fashionable, but the paper bag, with its history of economic and environmental controversy, still lurks in the background, ready to take over in the wake of a plastic bag ban.<sup>123</sup> Opponents of plastic bag bans argue that bans will force stores to turn to paper bags instead, an option they argue is equally harmful to the environment.

Opponents of bans can point to the drawbacks of paper bag production, including higher air and water pollution than is associated with producing plastic bags, high production costs, and deforestation.<sup>124</sup> They can further tout the benefits of plastic bags, such as decreased landfill space, cheap production, easy transportation, recyclability, and reusability.<sup>125</sup> On the other hand, paper bags come from a renewable resource, usually contain recycled material, and are themselves recyclable.<sup>126</sup> Plastic is usually made from nonrenewable resources such as oil, which can take up to 1000 years to decompose, and plastic kills marine animals who mistake the material for food.<sup>127</sup> This debate becomes relevant in court when a plastic bag ban plaintiff challenges a governmental body's evaluation of the environmental impacts of its bag policy. But to reach this point, a plaintiff must first show standing to sue.

### *c. Standing*

To challenge an environmental regulation, a plaintiff must show a concrete, particularized, and "actual or imminent" injury in fact.<sup>128</sup>

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123. See Cecelia Goodnow, *BYOB: Bring Your Own Bag*, SEATTLE POST-INTELLIGENCER, Apr. 19, 2007, at C1; John Roach, *Are Plastic Grocery Bags Sacking the Environment?* NAT'L GEOGRAPHIC NEWS, Sept. 2, 2003, [http://news.nationalgeographic.com/news/2003/09/0902\\_030902\\_plasticbags.html](http://news.nationalgeographic.com/news/2003/09/0902_030902_plasticbags.html).

124. Producing a paper bag can produce 70 percent more air pollution and fifty times the water pollution than plastic bag production. Goodnow, *supra* note 123; see also Joe Eskenazi, *Baggage*, S.F. WKLY., Jan. 7, 2009, available at <http://www.sfweekly.com/2009-01-07/news/baggage> (deeming San Francisco's 2007 plastic bag ban a failed policy because it encouraged a switch to disposable paper bags and made no significant reductions in the city's landfill needs).

125. Plastic bags generally cost one to two cents to produce, whereas paper bags can cost five to eight cents. Goodnow, *supra* note 123.

126. See *id.*

127. *Id.*

128. *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 560 (1992); see also *Friends of the Earth, Inc. v. Laidlaw Env'tl Servs. (TOC), Inc.*, 528 U.S. 167 (2000).

This injury must be “traceable to the challenged action of the defendant” and remediable by a favorable court decision.<sup>129</sup> Although individuals might theoretically sue a municipality that banned bags,<sup>130</sup> plaintiffs seeking to invalidate bag bans are usually coalitions of plastic bag manufacturers.<sup>131</sup> The plastic bag industry has, understandably, not responded favorably to municipal plastic bag bans and has been fighting such bans for decades. Nearly twenty years ago, a suit about a bag ban in New York state set out arguments about standing and the merits of bag use that would recur in many later suits.

In 1991, the Society of the Plastics Industry (SPI) challenged an ordinance banning certain types of plastic bags in Suffolk County, New York.<sup>132</sup> With a 1988 ordinance, the Suffolk County Legislature had prohibited retail food establishments from distributing non-biodegradable plastic bags.<sup>133</sup> The legislature found that these plastic products “constituted the largest single retail source of plastic bags in the waste stream, and were an impediment to recycling because they are neither recyclable nor compostable.”<sup>134</sup> The legislature also found that there were “readily available” alternatives to the banned plastic products.<sup>135</sup> SEQRA required the county to submit an environmental assessment form to the state’s Council on Environmental Quality (CEQ), which would then decide if the county needed to create a full environmental impact statement.<sup>136</sup> After the county submitted the requisite form for the ban, the CEQ decided that the ban would have “no significant environmental impact,” allowing the county to move forward with its

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129. *Lujan*, 504 U.S. at 560-61.

130. It is difficult to conceive of an injury that would get an individual plaintiff over the standing hurdle. The plaintiff would have to demonstrate a direct injury from a town’s ban on plastic bags. An employee of a bag manufacturing company might base a claim on any unemployment resulting from a ban, but this injury would require that a town or country that banned bags also be home to a bag manufacturing facility. Otherwise, a single municipality’s ban is not likely to be the sole cause of bag company layoffs.

131. *See, e.g., Soc’y of the Plastics Indus., Inc. v. County of Suffolk*, 573 N.E.2d 1034 (N.Y. 1991); *see also* David Gorn, *San Francisco Plastic Bag Ban Interests Other Cities* (NPR radio broadcast Mar. 27, 2008), *available at* <http://www.npr.org/templates/story/story.php?storyId=89135360> (follow “Listen to the Story” hyperlink).

132. *Soc’y of the Plastics Indus.*, 573 N.E.2d at 1034.

133. *Id.* at 1036.

134. *Id.*

135. *Id.*

136. *Id.*

plan.<sup>137</sup> SPI alleged that the city's environmentally motivated measure would either be ineffectual or actually harmful to the environment, facts the city would have discovered had it done a full environmental impact statement.<sup>138</sup>

The New York Court of Appeals held that SPI lacked standing to challenge the legislature's ban because SPI had not demonstrated that "the interests it assert[ed] in this litigation [were] germane to its purposes."<sup>139</sup> SPI is a nationwide nonprofit trade organization.<sup>140</sup> At the time of this case, SPI represented "at least eight unspecified member companies" in Suffolk County.<sup>141</sup> A local plastic manufacturer whose products were not affected by Suffolk County's ban, Wittman & Co., and SPI were the only plaintiffs who actually participated in the litigation.<sup>142</sup> SPI claimed it was asserting its members' rights to be free from adverse environmental impacts within Suffolk County: the Suffolk County bag ban would require businesses and citizens to use paper substitutes, which would increase waste volumes, in turn increasing "trucking traffic to and from disposal sites ... [and] waste in landfills, with attendant effects including possible hazardous leachate seeping into the aquifer."<sup>143</sup> Because such a claim would be personal to SPI's members,<sup>144</sup> and only one of its members, Wittman & Co., was a named party with a presence in Suffolk County, the court looked for a readily cognizable environmental injury to Wittman & Co.<sup>145</sup> The record indicated only that Wittman & Co. had an office in the county and that it manufactured fiberglass and plastic products not affected by the plastic law.<sup>146</sup> The court found no cognizable injury for Wittman & Co. and dismissed the suit for lack of standing.<sup>147</sup>

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137. *Id.*

138. *Id.* at 1037.

139. *Id.* at 1043.

140. *Id.* at 1037. *See generally* Society of the Plastics Industry, <http://www.plasticsindustry.org> (last visited Feb. 16, 2010).

141. *Soc'y of the Plastics Indus.*, 573 N.E.2d at 1037.

142. *Id.*

143. *Id.* at 1044.

144. *Nat'l Wildlife Fed'n v. Cleveland Cliffs Iron Co.*, 684 N.W.2d 800, 814 (Mich. 2004) ("Nonprofit organizations ... have standing to bring suit in the interest of their members where such members would have standing as individual plaintiffs.").

145. *Soc'y of the Plastics Indus.*, 573 N.E.2d at 1043.

146. *Id.*

147. *Id.*

This was a victory for the county, but the *Society of the Plastics Industry* decision demonstrates that a municipality considering a bag ban must dot its biodegradable i's and cross its compostable t's if it wants to ensure that its ban can withstand legal challenge. If the municipality is in a state that requires a NEPA-type of environmental review, it must adequately examine the impacts of a ban and the possible alternatives to a ban before eliminating plastic bags. If plastics manufacturers or other plaintiffs are able to find a particularized injury when a town bans plastic bags, the town must be ready to defend the procedure of adopting its ban. This has been an important lesson for cities across the country, especially several in California. Oakland, Fairfax, Manhattan Beach, and San Francisco, among others, all banned or attempted to ban plastic bags during 2007 and 2008.<sup>148</sup> Plastic manufacturers responded with the same kinds of arguments found in the *Society of the Plastics Industry* suit.

#### *d. Lawsuits in California*

Lawsuits can be a valuable persuasive tool for opponents of bag bans. In northern California, the town council of Fairfax abandoned its proposed bag ban in 2008 when plastic industry groups threatened to sue.<sup>149</sup> After the city of Oakland banned nonbiodegradable plastic bags in 2007, the Coalition to Support Plastic Bag Recycling<sup>150</sup> sued the city, alleging that the ban would force consumers to use more paper bags to generate more pollution and require more energy than recycling plastic bags.<sup>151</sup> The Alameda County Superior Court invalidated Oakland's ban, holding that "because of ... the unanimity of the uncertainty whether paper bags are less (or more) environmentally friendly than plastic bags,"

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148. See *infra* Part III.B.1.d.

149. See Gorn, *supra* note 131. Later that year, Fairfax residents approved a ballot measure enacting the ban, accomplishing the same policy result while insulating the town from a lawsuit. Rob Rogers, *Fairfax Bans Bags, Keeps Elected Clerk*, MARIN INDEP. J., Nov. 4, 2008, available at [http://www.marinij.com/ci\\_10900602?source=most\\_viewed](http://www.marinij.com/ci_10900602?source=most_viewed). Fairfax ballot measures do not require the same environmental review procedures that town council measures do. *Id.*

150. This group includes seven plastic bag manufacturers. Kari Huus, *Plastics Industry Battles Grocery Bag Bans*, MSNBC.COM, Mar. 14, 2008, <http://www.msnbc.msn.com/id/23596727>.

151. *Id.*

Oakland needed to create a full environmental impact report.<sup>152</sup> In southern California, Manhattan Beach banned all point-of-sale plastic bags in 2008.<sup>153</sup> The Save the Plastic Bag Coalition<sup>154</sup> successfully sued to invalidate the ban, and as of 2009, Manhattan Beach had appealed the decision.<sup>155</sup>

These failed bans may have discouraged many small cities from trying similar policies,<sup>156</sup> but at least ten other municipalities have pressed ahead, and not just in California: in Alaska, Connecticut, Hawaii, North Carolina, and Washington.<sup>157</sup> The flagship of bag bans came out of San Francisco. Enacted in March 2007,<sup>158</sup> San Francisco's ban on noncompostable bags is still in place. Plastics industry representatives vigorously fought San Francisco's ban. When the city began floating a proposition for a tax on plastic bags in 2004, plastics manufacturers began a campaign for measures based on personal responsibility instead of taxes, painting them-

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152. See Press Release, Progressive Bag Affiliates of the Am. Chemistry Council, Court Decision to Require Oakland to Examine Adverse Impacts of Banning Plastic Bags (Apr. 18, 2008), available at <http://www.reuters.com/article/pressRelease/idUS225218+18-Apr-2008+PRN20080418>.

153. See City of Manhattan Beach: Plastic Bag Ban and Reusable Bag Program, <http://www.citymb.info/Index.aspx?page=1589> (last visited Feb. 16, 2010).

154. See SavethePlasticBag.com, The Coalition, <http://www.savetheplasticbag.com> (last visited Feb. 16, 2010); see also Belinda Luscombe, *The Patron Saint of Plastic Bags*, TIME, July 27, 2008, available at <http://www.time.com/time/nation/article/0,8599,1827021,00.html>; Stephanie Rogers, *Who's Behind the 'Save the Plastic Bag' Campaign?*, EARTHFIRST.COM, Sept. 19, 2008, <http://earthfirst.com/whos-behind-the-save-the-plastic-bag-campaign> ("Save the Plastic Bag is an attempt to debunk 'misinformation' about plastic bags, and Stephen Jones is head of the campaign to bring their protests to the public.")

155. The Coalition argued that Manhattan Beach had violated CEQA by failing to conduct an environmental impact report for the ban. Phuong Le, *Battle in Seattle: A Vote on Plastic Bag Fees*, SAN JOSE MERCURY NEWS, Aug. 15, 2009, at A7; *Plastic-bag Lawsuit in Manhattan Beach*, S.F. CHRON., Aug. 20, 2008, at B7.

156. See Steve Hahn, *The Politics of Plastic: County Public Works Considers Regulating One-Time Use Plastic Bags*, SANTACRUZ.COM, [http://www.santacruz.com/The\\_Politics\\_of\\_Plastic/](http://www.santacruz.com/The_Politics_of_Plastic/) (last visited Feb. 16, 2010) (according to Save our Shores Marine Debris Coordinator Aleah Pine-Lawrence, "Jurisdictions around the state were considering a ban and beginning to move forward, but when they heard Oakland was being sued many of them stepped back and decided to wait to see how the lawsuit plays out").

157. As of December 2009, municipalities with bans in place or scheduled to begin in 2010 include Hooper Bay, Alaska; Bethel, Alaska; Westport, Connecticut; Maui Canty, Hawaii; three counties in North Carolina; and Edmonds, Washington. Mike Verespej, *Fairbanks and North Pole, Alaska, Tax Disposable Plastic Bags*, PLASTICSNEWS.COM, Sept. 14, 2009, <http://plasticsnews.com/headlines2.html?id=16602>.

158. Charlie Goodyear, *S.F. First City To Ban Plastic Shopping Bags*, S.F. CHRON., Mar. 28, 2007, at A1.

selves as responsible environmental stewards.<sup>159</sup> Meanwhile, the city's Department of the Environment conducted a study of San Francisco's single-use bag consumption.<sup>160</sup> In 2006, Governor Schwarzenegger signed a bill mandating in-store bag recycling programs at grocery stores and forbidding local agencies from imposing additional fees or regulations on bag distributors.<sup>161</sup> Unable to impose their planned tax, San Francisco's Board of Supervisors decided to bypass the state's fee restriction and ban bags altogether.<sup>162</sup>

San Francisco's ordinance requires grocery stores with gross annual sales over two million dollars and pharmacies with at least five locations within the city limits to provide their customers with only recyclable paper bags, compostable plastic bags, or reusable bags.<sup>163</sup> The law imposes fines of up to \$500 for each violation of the ban<sup>164</sup> and allows the City Attorney to seek "legal, injunctive, or other equitable relief" to enforce the ban.<sup>165</sup> The Board insulated the ordinance from a paper versus plastic attack by defining "recyclable paper bags" as those that "contain[] no old growth fiber," are "100% recyclable overall," and "contain[] a minimum of 40% post-consumer recycled content."<sup>166</sup> The paper bags that replaced nonbiodegradable plastic thus had to meet minimum requirements of environmental friendliness.

San Francisco's ban has so far demonstrated that this policy option can work without yielding to legal challenge. Ban opponents

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159. They called this campaign "sack the tax." Jennie Reilly Romer, Comment, *The Evolution of San Francisco's Plastic-Bag Ban*, 1 GOLDEN GATE U. ENVTL. L.J. 439, 452-53 (2007).

160. *Id.*

161. *See id.* at 455-56; Press Release, Cal. Integrated Waste Mgmt. Bd., State Kicks Off Progressive Plastic Bag Recycling Program: New Law Makes it Easier for Consumers To Recycle Their Plastic Bags (July 2, 2007), available at <http://www.ciwmb.ca.gov/Pressroom/2007/July/37.HTM>.

162. Romer, *supra* note 159, at 457.

163. S.F. CAL., ENV'T CODE §§ 1702(l), 1703(a) (2007), available at <http://www.municode.com/content/4201/14134/HTML/ch017.html>.

164. *Id.* § 1705(a) ("Any person who violates this Ordinance shall be guilty of an infraction. If charged as an infraction, upon conviction thereof, said person shall be punished by (1) a fine not exceeding \$100.00 for a first violation, (2) a fine not exceeding \$200.00 for a second violation within the same year, and (3) a fine not exceeding \$500.00 for each additional violation within the same year.").

165. *Id.* § 1705(c).

166. *Id.* § 1702(j).

have not initiated a lawsuit against San Francisco like the suits against Oakland and Manhattan Beach. The California Assembly's prohibition of bag fees gave San Francisco's leaders added impetus to jump straight to the ban option, but other cities working without such a restriction should still favor bans over fees.

*e. Bans Are the Best Option*

San Francisco's ban is still in effect, even though opponents have plenty of ammunition for criticizing the policy. Bans have some definite downsides. Most obviously, plastic bags are useful. For certain tasks, such as sanitary storage of meat and produce, their benefits seem to outweigh negative consequences.<sup>167</sup> American plastics producers employ over one million workers,<sup>168</sup> and forcing the industry to switch to all biodegradable production could be costly and endanger jobs. Enforcing a ban can be difficult. Even though the Suffolk County ban ultimately survived a legal challenge, enforcement was its undoing. The county legislature put off enforcement efforts as retail food stores and fast food chains kept requesting more time to find cost-effective, environmentally friendly substitutes for traditional plastic bags.<sup>169</sup> The legislature eventually eliminated the ban and instead called for more recycling.<sup>170</sup> Cost is another downside. Especially during a recession, Americans are not likely to look favorably on a governmental measure that they believe may increase their cost of living. Suffolk County banned bags in the midst of a recession, when citizens were especially concerned about regulations that increased cost of living in even small ways.<sup>171</sup> Finally, banning plastic bags, but not disposable

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167. See Akullian et al., *supra* note 22, at 13.

168. See SPI: The Plastics Industry Trade Association, About SPI, <http://www.plasticsindustry.org/aboutspi/?navItemNumber=1009> (last visited Feb. 16, 2010).

169. John T. McQuiston, *Suffolk Legislators Drop a Ban on Plastic Packaging for Foods*, N.Y. TIMES, Mar. 9, 1994, at B1. But note that a regulation that required large retail chains to eliminate plastic bags from their check out lines would be easier to enforce than a regulation that simply prohibited consumers from having the bags. See Christopher Bodeen, *China Banning Free Plastic Shopping Bags*, S.F. CHRON., Jan. 10, 2008, at C4 ("Christopher Flavin, president of Worldwatch Institute ... said: 'China ... [has] had problems enforcing programs in the past, but this [ban] is easy to enforce because it has to be implemented on the retail level.'").

170. McQuiston, *supra* note 169, at B1.

171. *Id.*

paper bags, eliminates the harmful externalities of plastic, but perpetuates the environmental problems associated with using paper bags.<sup>172</sup>

Local governments that seek to ban bags must be ready to respond to these criticisms, especially because plastic bag bans are not yet a norm across the country and inspire so much controversy. Local governments that ban bags can encounter first-mover type disadvantages when they enact a ban without surrounding towns adopting similar measures. They may become lightning rods for the lawsuits and negative publicity that can follow restricting plastic bags. A lone municipality imposing a ban might also encounter free-rider problems.<sup>173</sup> If a city or state bans plastic bags while the surrounding region keeps the plastic stream flowing, then the former will be paying for the environmental benefits of reduced plastic use, while the latter enjoys the same benefits for no cost.<sup>174</sup> This free-rider issue should concern policymakers, but it can be overcome.

The Montreal Protocol provides an international example of an environmentally motivated product ban that safeguards against free riders.<sup>175</sup> This multilateral agreement requires signatories to eliminate consumption and production of ozone-depleting substances (ODS).<sup>176</sup> After the Protocol was signed in 1987, ODS

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172. Akullian et al., *supra* note 22, at 9.

173. See, e.g., Fredrik Buström & Jouni Korhonen, *Municipalities and Industrial Ecology: Reconsidering Municipal Environmental Management*, 9 SUSTAINABLE DEV. 36, 39 (2001).

174. See Richard L. Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553, 561 (2001) (discussing Mancur Olson's theories on collective action, including the free rider problem where a group pays for a benefit but an individual member avoids paying and enjoys a free ride: "the logic of collective action establishes that a rational individual will not contribute to the formation of groups that provide collective benefits").

175. Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, S. TREATY DOC. NO. 100-10, 1522 U.N.T.S. 3 (entered into force Jan. 1, 1989); Press Release, United Nations Sec'y Gen. Dep't of Pub. Info., Montreal Protocol on Ozone-Depleting Substances Effective, but Work Still Unfinished, Says Secretary-General in Message for International Day (Sept. 7, 2006), available at <http://www.un.org/News/Press/docs/2006/sgsm10620.doc.htm> ("Since the entry into force of this multilateral environmental agreement, there has been tremendous progress in global efforts to repair the ozone layer. As a consequence, there are now early signs that we are on the road to recovery of this precious life-support system.").

176. United Nations Development Programme, Phasing Out Ozone Depleting Substances and Safeguarding the Global Climate, <http://www.undp.org/chemicals/montrealprotocol.htm> (last visited Feb. 16, 2010).

concentrations in the atmosphere stopped increasing and eventually stabilized.<sup>177</sup> The effort was successful for many reasons, including the internationally recognized urgency of the problem.<sup>178</sup> More importantly for this Note, the Protocol was successful because it prohibited trade of ODS between signatories and nonsignatories, providing for sanctions against violators.<sup>179</sup> This prevented nonsignatories from producing and selling ODS to signatory countries. The Protocol's success demonstrates that product bans can work on a larger scale.

A smaller governmental body seeking to ban plastic bags in the current American regulatory climate would likely not have access to an overarching authority that could enforce similar sanctions on plastic trade between regions, but this should not automatically deter local and state authorities. Plastic bag bans have to start somewhere. The more local authorities that ban plastic bags, the more clout local legislators will have to encourage others in their region to follow suit.

Bans are worthwhile goals for lawmakers, and should be enacted despite the possibility of legal challenge,<sup>180</sup> the threat of negative publicity, and the possibility that other regions will be free riders.<sup>181</sup> Legal challenges can usually be overcome if municipalities follow proper state environmental impact assessment procedures. Negative publicity is unpleasant but a flimsy justification for avoiding a necessary policy. Free-rider issues will only justify continued plastic

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177. Thomas Dietz et al., *The Struggle To Govern the Commons*, 302 SCIENCE 1907 (2003).

178. JAMES G. SPETH, RED SKY AT MORNING: AMERICA AND THE CRISIS OF THE GLOBAL ENVIRONMENT 94 (2004) (noting the discovery of the hole in the Ozone layer).

179. Scott Barrett, *Montreal v. Kyoto: International Cooperation and the Global Environment*, in GLOBAL PUBLIC GOODS: INTERNATIONAL COOPERATION IN THE 21ST CENTURY 192, 210 (Inge Kaul et al. eds., 1999).

180. Cf. CAL. OCEAN PROTECTION COUNCIL, CAL. MARINE DEBRIS STEERING COMM. & GORDON ENVTL. CONSULTING, AN IMPLEMENTATION STRATEGY FOR THE CALIFORNIA OCEAN PROTECTION COUNCIL RESOLUTION TO REDUCE AND PREVENT OCEAN LITTER 6 (2008), available at [http://www.opc.ca.gov/webmaster/ftp/pdf/opc\\_ocean\\_litter\\_final\\_strategy.pdf](http://www.opc.ca.gov/webmaster/ftp/pdf/opc_ocean_litter_final_strategy.pdf) ("The Steering Committee has identified three priority actions for reducing and preventing litter, including .... prohibitions on specific types of packaging that commonly become litter, such as single-use grocery bags.").

181. *But see* Kathleen Segerson & Thomas J. Miceli, *Voluntary Approaches to Environmental Protection: The Role of Legislative Threats*, in VOLUNTARY APPROACHES IN ENVIRONMENTAL POLICY 105, 114 (Carlo Carraro & François Lévêque eds., 1999) (discussing free-rider problems in environmental regulation and favoring voluntary measures over mandatory regimes).

use if bans continue to be spotty. Because plastic regulation must start somewhere and the federal government is unlikely to join the fray in the near future, local and state policymakers cannot allow the current scarcity of plastic bag bans to deter environmental preservation.

As further motivation for policymakers, the Pacific Garbage Patch lurks behind the downsides to bag bans: a massive, wet, tangible problem that will not be remedied by stop-gap measures. In just fifty years, humans have released enough plastic into the Pacific to cover an area at least as large as Texas,<sup>182</sup> creating dangers for sea life and human health.<sup>183</sup> The size of the patch demonstrates humanity's power to alter the natural environment—a power that could be channeled into preserving resources through mandatory environmental measures. San Francisco's bag ban is too recent for explorers and scientists to have data on its effectiveness in deterring ocean pollution, but eliminating the use of the pollutant remains the best logical tool to reduce the amount of the pollutant in the environment. Bans of plastic bags have some disadvantages, but in weighing those disadvantages against a state-sized waste problem, there is no contest. Moreover, plastic bag bans are a better solution for this problem than many alternatives proposed by opponents, such as biodegradable bags, recycling programs, and targeted taxes.

## 2. *Less Viable Alternatives*

### a. *Biodegradable Plastics*

Requiring stores to distribute only biodegradable bags is a more environmentally friendly option than maintaining the current petroleum- and gas-based system. Biodegradable plastic is made from plant polymers<sup>184</sup> that would break down faster in ocean water than traditional bags.<sup>185</sup> However, these bags have several drawbacks.<sup>186</sup> Biodegradable bags look and feel like traditional plastic

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182. See *supra* note 5 and accompanying text.

183. See Derraik, *supra* note 14, at 844; Kostigen, *supra* note 15.

184. HETHERINGTON ET AL., *supra* note 5, at 32.

185. Levitt, *supra* note 86.

186. Because many bioplastics include a portion of nonbiodegradable synthetic material, a bioplastic bag could still end up contributing to the Pacific Garbage Patch problem. See HETHERINGTON ET AL., *supra* note 5, at 34.

bags, but may be weaker when wet than traditional bags.<sup>187</sup> They cost about eight times as much as traditional bags to produce,<sup>188</sup> and a massive switch to biodegradable plastics would require new waste management systems that could incorporate compostable materials.<sup>189</sup> Recycling these bags can be logistically difficult as well: mixing biodegradable and nonbiodegradable plastic makes a batch of recycled material structurally unstable, forcing the producer to send the product to a landfill.<sup>190</sup>

Converting to biodegradable bags is more of a stop-gap measure than a solution for the Pacific Garbage Patch. Even if biodegradable bags take months to break down, sea animals have plenty of opportunities to snack on the plastic during that process. This policy option does not aim to stop the release of garbage into the environment, it merely aims to make that garbage less harmful.

#### *b. Recycling*

Recycling is another option for reducing both plastic production and pollution. Many large stores have their own plastic bag recycling programs, but governmental bodies are also taking up this cause. The California Assembly requires certain large retail stores to provide in-store recycling facilities for plastic carry-out bags.<sup>191</sup> New York City adopted a similar measure in 2008, requiring stores that give customers plastic bags to provide recycling bins in a “prominent” place in the store.<sup>192</sup> These recycling programs are

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187. Romer, *supra* note 159, at 448.

188. See Proctor, *supra* note 112, at B8.

189. HETHERINGTON ET AL., *supra* note 5, at 33; Proctor, *supra* note 112, at B8.

190. Proctor, *supra* note 112, at B5.

191. See CAL. PUB. RES. CODE §§ 42250-42257 (West 2007); 2006 Cal. Legis. Serv. 5023 (West). In exchange for requiring recycling, the Assembly agreed to remove plastic bag fees for those stores that had to institute recycling programs. See At-Store Recycling Program: Plastic Carryout Bags, <http://www.ciwmb.ca.gov/LGCENTRAL/Basics/PlasticBag.htm> (last visited Feb. 16, 2010) [hereinafter Recycling Program]. This concession forced San Francisco to scrap its proposed bag tax. Romer, *supra* note 159, at 456-57.

192. Barnard, *supra* note 86 (“[U]nder the ... bill, which had a surprising amount of support from retailers and plastic-bag manufacturers, stores that give the bags to customers must provide recycling bins for the bags in a prominent place in the store. The legislation applies to stores of 5,000 square feet or larger, as well as all branches of chains with more than five locations in the city.”). Notably, a plastic bag trade group, the Progressive Bag Affiliates, supported this bill. *Id.*

positive steps but not guaranteed to be effective at eliminating the distribution of plastic bags which cause the sea accumulation.

Recycling is a worthy goal and a sound idea, but it ultimately depends on voluntary action. Consumers must remember not to trash their bags and to drop them off at an appropriate facility. Less than 5 percent of California's plastic bags were being recycled when the State passed its recycling law,<sup>193</sup> which made mandatory the recycling programs that many stores already had in place. As a country, Americans only recycle 10 percent of the nine billion pounds of bags they use annually.<sup>194</sup> Moreover, used plastic bags can be transformed into other plastic products, but those products are often not themselves recyclable. Plastic bags are not even easily recyclable into more bags.<sup>195</sup> Recycling could help reduce the amount of plastic that exists in the world, but like a switch to biodegradables, it merely perpetuates the existence of a dangerous material.

### *c. Taxes*

In a less extreme alternative to a flat out ban on plastic bags, some environmentalists suggest instituting a consumer tax on the types of plastic that end up polluting the ocean, forcing consumers to internalize external environmental costs of plastic use. A typical environmentally-focused tax would apply to pollution itself. For example, a factory might have to pay a tax for every unit of pollution it emits. Optimally, this kind of tax, proposed by economist Arthur Pigou, would impose just enough costs to balance environmental degradation against market efficiency.<sup>196</sup> A Pigouvian plastic bag tax imposed on consumers would ideally curb unnecessary environmental degradation, forcing consumers of plastic bags to pay just enough to account for the externalities of plastic use.<sup>197</sup> A tax on

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193. See Recycling Program, *supra* note 191 (citing the Progressive Bag Alliance).

194. Levitt, *supra* note 86.

195. Romer, *supra* note 159, at 445-46 ("Because plastic bags can only be 'down-cycled' and not truly recycled, plastic bags ... are made into other plastic products that are not further recyclable.")

196. For more on this theory, see HAL R. VARIAN, INTERMEDIATE MICROECONOMICS: A MODERN APPROACH 613-14 (6th ed. 2003).

197. See Akullian et al., *supra* note 22, at 15 ("Overall, a Pigouvian tax on plastic bags is much more effective if placed on consumers [rather than retailers] because the goal of the tax is to affect consumer behavior, not raise revenue from retailers."); Hohn, *supra* note 36 ("The

retailers who distribute plastic bags could have similar results. Denmark's plastic tax on retailers reduced plastic bag consumption in that country by 66 percent.<sup>198</sup> Finding a balance between economic efficiency and environmental preservation is difficult, but to be effective, a plastic bag tax need not be precisely Pigouvian.<sup>199</sup>

Ireland's bag tax demonstrates that an environmentally motivated tax can change consumer behavior without severe negative economic impacts. Customers at Irish stores pay thirty-three cents per plastic bag.<sup>200</sup> Weeks after the tax began, plastic bag use dropped 94 percent.<sup>201</sup> This is not a strictly Pigouvian tax. It does not specifically take into account externalities associated with plastic bag use. It simply aims to charge customers enough to make them stop and think about using plastic bags.<sup>202</sup> Revenues from the tax pay for cleanup initiatives and environmental enforcement.<sup>203</sup> Retailers initially opposed this tax, but changed their position after the average supermarket enjoyed increased sales of reusable bags and saved fifty million euros annually from reduced bag stocking costs.<sup>204</sup>

Seattle became America's ground zero for plastic bag tax controversy in 2008. Seattle passed an ordinance in July 2008 levying a 20-cent tax on paper and plastic bags.<sup>205</sup> In August of 2009, Seattle voters rejected the tax via a referendum initiated by the plastics

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time for voluntary measures has long since passed,' says Steve Fleischli, president of Waterkeeper Alliance .... Fleischli would have us tax the most pervasive and noxious plastic pollutants—shopping bags, plastic-foam containers, cigarette butts, plastic utensils—and put the proceeds toward cleanup and prevention measures .... Such levies shouldn't be seen as criminalizing the makers and sellers of plastic disposables, he argues; they merely force those businesses to 'internalize' previously hidden costs, what economists call 'externalities.'").

198. Akullian et al., *supra* note 22, at 15.

199. Researchers at Brown University estimate that the ultimate social cost of a single plastic bag is \$0.1052, accounting for CO<sub>2</sub> emissions, landfill costs, and costs associated with litter and improper recycling. *Id.* at 17.

200. Rosenthal, *supra* note 112.

201. *Id.*

202. Convery et al., *supra* note 112, at 3.

203. *Id.* at 6.

204. Akullian et al., *supra* note 22, at 15.

205. Kathy Mulady & Amy Rolph, *Effort To Overturn 20-Cent Bag Tax Moves Forward*, SEATTLE POST-INTELLIGENCER, Aug. 25, 2008, at A1. One month after the ordinance passed, the Coalition To Stop the Seattle Bag Tax turned in a petition to the City Clerk to include the ordinance on a ballot for voters to approve. The American Chemistry Council funds most of the Coalition's activities. *Id.*

industry.<sup>206</sup> Opponents of Seattle's tax claimed that fees on retail shopping bags would decrease use of those bags, but increase purchases of other disposable plastic bags.<sup>207</sup> They also argued that taxing plastic bags would encourage customers to simply fill up a cart and leave the store without paying for their goods.<sup>208</sup> Continuing debate about such a tax's consequences in other cities illustrates the challenges of plastic taxation.<sup>209</sup> Although taxes can dramatically reduce plastic bag use, they are, like recycling and biodegradable plastics, an inadequate solution. As long as nonbiodegradable plastic bags are available to consumers, they have the potential to end up as a part of the Pacific Garbage Patch. This is why plastic bag bans are a good environmental option. For policymakers serious about crafting effective policy to fight the Pacific Garbage Patch problem, plastic bag bans are the only real option.

### *C. Moral Imperative*

The political and legal controversy swirling around the plastic problem poses a daunting challenge to those who join the policy fray. The costs of effectively addressing the garbage problem in the Pacific provide ample fodder for opponents of environmental preservation efforts. A myriad of economic considerations weigh against many kinds of environmental protection. For many, the ability to compete economically in a global market trumps environmental concerns.<sup>210</sup> But monetary cost is not necessarily the only consideration when global environmental resources are at stake. A growing body of environmental regulatory theory classifies environmental

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206. Jay Yarow, *Seattle Rejects Its Plastic Bag Tax*, BUS. INSIDER, Aug. 19, 2009, available at <http://www.businessinsider.com/seattle-rejects-its-plastic-bag-tax-2009-8>.

207. See Press Release, Am. Chemistry Council, Seattle Mayor's Proposal Counters National Recycling Trend Bag Tax, Product Ban Risk the Environment (Apr. 4, 2008), available at [http://www.americanchemistry.com/s\\_acc/sec\\_news\\_article.asp?CID=206&DID=7208](http://www.americanchemistry.com/s_acc/sec_news_article.asp?CID=206&DID=7208).

208. *Id.*

209. In 2009, Washington D.C. passed a 5-cent fee on plastic bags, while New York City dropped its proposed 5-cent bag fee. Yarow, *supra* note 206.

210. See generally Albert Bandura, *Impeding Ecological Sustainability Through Selective Moral Disengagement*, 2 INT'L J. INNOVATION & SUSTAINABLE DEV. 8 (2007).

preservation as a moral imperative that cannot be overridden through a simple cost-benefit analysis.<sup>211</sup>

Debate about climate change now highlights the intersection of morality and environmental preservation. Climate change crusader and former Vice President Al Gore claims that the climate change issue is “a question of right versus wrong. Put simply, it is wrong to destroy the habitability of our planet and ruin the prospects of every generation that follows ours.”<sup>212</sup> When environmental protection becomes a moral imperative, the relative costs and benefits of makeshift remedies, such as bag taxes and voluntary best management practices, become less persuasive in choosing a policy. In the issue at hand, morally unacceptable environmental harms associated with plastic bag use override the relative merits of plastic and paper disposable bags. Because plastic use is inherently unacceptable, the drawbacks of paper bag use are less important than curtailing plastic use, and measures that only slightly reduce plastic use are insufficient. California’s nurdle law and San Francisco’s bag ban reflect this attitude. These two policies are short term waves in a movement that could swell into a long-term political, legal, and environmental sea change.

#### CONCLUSION

Even though the scale of this Pacific tragedy of the commons indicates that international and national policies are in order, the most realistically effective policy weapons for combating the spread of the Pacific Garbage Patch are currently found in state and local laws. California’s nurdle restrictions and San Francisco’s plastic bag ban are models for the type of legislation that provide the best

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211. See, e.g., ANDREW DOBSON, *CITIZENSHIP AND THE ENVIRONMENT* (2003) (discussing how “ecological citizenship” prioritizes environmental concerns over financial incentives); SPETH, *supra* note 178, at 192; Douglas A. Kysar, *Climate Change, Cultural Transformation, and Comprehensive Rationality*, 31 B.C. ENVTL. AFF. L. REV. 555, 556 (2004) (discussing Speth’s belief that the inadequacies of cost-benefit analysis in crafting climate change policy means that “an entirely new model of global environmental governance is required, one in which ... a fundamentally transformed culture ... views environmental sustainability and global equity as moral imperatives to be implemented through dynamic local, regional, and nongovernmental initiatives, as well as through a well-funded and well-respected World Environmental Organization”).

212. Al Gore, *Moving Beyond Kyoto*, N.Y. TIMES, July 1, 2007, at 413.

short-term options for preventing plastics from reaching the ocean. Strict industrial plastic management guidelines and bans on plastic bags acknowledge that every piece of plastic has the potential to end up as sea litter, and that environmental regulation must acknowledge more than basic economic costs. Effective environmental legislation embodies the notion that mankind is a steward of natural resources, especially globally important resources like the Pacific Ocean. Small policies can encourage widespread acceptance of the environmental moral imperative, beginning a positive sea change in American social and political thought: a sea change that could change the sea.

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