Snakes on a Plain, or in a Wetland: Fighting Back Invasive Nonnative Animals—Proposing a Federal Comprehensive Invasive Nonnative Animal Species Statute

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This Article argues for the establishment of a federal comprehensive invasive nonnative animal statute. Scholars and regulators have advised the federal government to create a comprehensive scheme, but no such statute or proposed statute exists. Part I examines the problems nonnative invasive species pose to the United States, laying the groundwork for the "purpose" section of the statute. Part II crafts a rubric that could be utilized to create a comprehensive invasive species statute in the United States, including prevention, punishment, cost recovery and liability, and incentives. Part III looks at the strengths and deficiencies of the current federal statutes and frameworks for regulating nonnative invasive species, analyzing the Lacey Act and Executive Order 13,112, as well as the National Invasive Species Act (which addresses only aquatic nuisance species) and statutes related to single species. Part IV explores other tools currently available in federal and state laws that may apply to invasive species under certain circumstances. The evaluation will demonstrate that the invasive animal law puzzle has missing pieces and illuminate what would be needed to create a comprehensive statute. Part V consolidates these ideas, returns to the rubric, crafts a framework, and offers suggestions for a model federal statute.

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Forget the war on drugs. What the United States needs is a war on invasive animal species. Burmese pythons swallowing American alligators in the Everglades, Asian carp invading the Great Lakes, and Zebra Mussels in California and the Great Lakes: this is just a sampling of nonnative invasive animal species horrors in the United States. Nonnative invasive animal species create a host of problems, such as environmental degradation, economic waste, public health risks, and personal injuries to humans. Unlike New Zealand, the United States does not have a federal comprehensive invasive species statute that regulates the invasive species problem in a centralized framework.[1] A variety of federal, state, and local laws regulate nonnative invasive species, but they are not well coordinated and do not fully address all the problems associated with invasive species.[2]

This Article argues that there should be a federal, comprehensive invasive nonnative animal species statute and recommends certain requirements for this scheme. Scholars and regulators have advised the federal government to create a comprehensive scheme, but have yet to recommend specific requirements for such a statute.[3] Part I examines the

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1. *See* Biosecurity Act 1993 (N.Z.). The Bahamas also has a draft National Invasive Species Strategy. *See* BAH. ENV'T, SCI., & TECH. COMM'N, THE NATIONAL INVASIVE SPECIES STRATEGY FOR THE BAHAMAS (2003), http://www.invasivespeciesinfo.gov/international/mexcarib.shtml (follow "The National Invasive Species Strategy For The Bahamas" hyperlink).

2. Robert B. McKinstry Jr. et al., *Legal Tools That Provide Direct Protection for Elements of Biodiversity*, 16 WIDENER L.J. 909, 928 (2007).

3. *See id.*; WORKING GRP. & SCI. COORDINATION GRP. OF THE S. FLA. ECOSYSTEM RESTORATION TASK FORCE, INVASIVE EXOTIC ANIMALS: MANAGING A THREAT TO EVERGLADES RESTORATION (Apr. 2010), *available at* www.sfrestore.org/information_brief/Final_Apr_06_10_Exotics.pdf.

problems nonnative invasive species pose in the United States, providing material for the "Purpose" section of the statute. Part II crafts a rubric that could be utilized to create a comprehensive invasive species statute, including prevention, punishment, cost recovery and liability, and incentives. Part III analyzes the strengths and deficiencies of the current federal statutes and frameworks for regulating nonnative invasive species, including the broadly-scoped Lacey Act and Executive Order 13,112, as well as narrowly scoped laws, such as the National Invasive Species Act (for aquatic nuisance species) and statutes related to single species. Part IV explores other tools currently available in federal and state laws that may apply to invasive species under certain circumstances. The evaluation will demonstrate that the puzzle has missing pieces and will illuminate what would be needed to create a comprehensive statute. Part V consolidates these ideas, returns to the rubric, and then crafts a framework and offers suggestions for a model federal comprehensive invasive species statute.

The scope of discussion will be limited to invasive animal species. Executive Order 13,112 defines invasive species as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health."[4] An alien species with respect to a particular ecosystem includes "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem."[5] While invasive plants fall within this definition, they pose slightly different problems to ecosystems.[6] As such, tools to manage and regulate invasive animal species may not be appropriate for invasive plant species, and vice versa. Additionally, laws on controlling invasive plant species already exist.[7] "Whereas invasive exotic plants have been the focus of various planning, prevention, and management activities for the past [thirty-five] years, the focus on invasive animals . . . began within the past decade."[8]

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4. Exec. Order No. 13,112, 64 Fed. Reg. 6183, 6183 (Feb. 8, 1999); NAT'L INVASIVE SPECIES COUNCIL, INVASIVE SPECIES DEFINITION CLARIFICATION AND GUIDANCE WHITE PAPER 1 (2006), http://www.invasivespeciesinfo.gov/docs/council/isacdef.pdf.

5. Exec. Order No. 13,112, 64 Fed. Reg. at 6183.

6. *See* David Pimentel et al., *Economic and Environmental Threats of Alien Plant, Animal, and Microbe Invasions*, 84 AGRIC., ECOSYSTEMS & ENV'T 1 (2001).

7. *See, e.g.*, Plant Protection Act, Pub. L. No. 106–224, 114 Stat. 438 (2000) (codified as amended at 7 U.S.C. §§ 7701-7786 (2006)). The Plant Protection Act created a detailed framework to regulate plant "pests," known both as invasive species or weeds, through different methods such as inspection, prohibition, and biological control. *Id.*

8. WORKING GRP. & SCI. COORDINATION GRP. OF THE S. FLA. ECOSYSTEM RESTORATION TASK FORCE, *supra* note 3, at 1.

I. THE SCOURGE OF INVASIVE SPECIES

The spread of nonnative invasive animal species in the United States is correlated with a plethora of problems. The environmental impacts are well known but there are also numerous less obvious impacts related to economic loss, crime and national security, and public health and safety.[9] For example, the removal of marine nonnative species such as zebra mussels costs hundreds of millions of dollars.[10] Recent data shows that "[w]ildlife trafficking is thought to be the third most valuable illicit commerce in the world, after drugs and weapons."[11] This Part examines the link between nonnative species with these harmful impacts.

A. Environmental Degradation

Some nonnative species cause wide-ranging ecological harms to ecosystems.[12] In extreme cases, the proliferation of a nonnative species in an area contributes to the decline and ultimate extinction of native fauna.[13] However, under different circumstances, a nonnative species could have barely any harmful impacts on an ecosystem.[14] This Part looks at the range of different environmental impacts on ecosystems, both direct and indirect.

1. Changes in the Ecosystem Balance

A new species can wreak havoc on an ecosystem's balance. The introduction of a predator can be devastating, especially on islands, lakes, and other isolated areas where native species have evolved in the absence of other predators.[15] In Guam, for example, the nonnative brown

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9. *See* BIOLOGICAL INVASIONS: ECONOMIC AND ENVIRONMENTAL COSTS OF ALIEN PLANT, ANIMAL, AND MICROBE SPECIES (David Pimentel ed., 2002); THE ECONOMICS OF BIOLOGICAL INVASIONS (Charles Perrings et al. eds., 2000).

10. James T. Carlton, *Environmental Impacts of Marine Exotics*, ACTION BIOSCIENCE (May 2004), http://www.actionbioscience.org/biodiversity/carlton.html.

11. Charles Bergman, *Wildlife Trafficking*, SMITHSONIAN, Dec. 2009, at 34, 37.

12. *See* Piran C.L. White et al., *Alien Invasive Vertebrates in Ecosystems: Pattern, Process and the Social Dimension*, 35 WILDLIFE RES. 171 (2008), *available at* http://fnicsearch.nal.usda.gov/bitstream/10113/16174/1/IND44063688.pdf.

13. *Id.* at 174.

14. *Id.*

15. *Invasive Non-Native Species*, ROYAL SOC'Y FOR THE PROTECTION OF BIRDS (last published July 15, 2011, 3:01 PM), http://www.rspb.org.uk/ourwork/policy/species/nonnative/index.aspx; *see* NAT'L INVASIVE SPECIES COUNCIL, 2008-2012 NATIONAL INVASIVE SPECIES MANAGEMENT PLAN 7 (Aug. 1, 2008), http://www.invasivespeciesinfo.gov/council/mp2008.pdf. For the impacts of the lionfish, see *Filleting the Lion*, NAT'L OCEAN SERV., http://oceanservice.noaa.gov/news/weeklynews/june10/eatlionfish.html (last updated June 21, 2010) ("This invasive species has the potential to harm reef ecosystems because it is a top predator that competes for

treesnake "has eliminated most native vertebrates (birds, bats, and lizards) that pollinate trees and flowers."[16] The discovery of a thirteen-foot Burmese python, which died trying to swallow a whole, live, six-foot alligator, caused biologists in Florida to fear "that the nonnative snakes could threaten a host of other animal species in the Everglades."[17] Giant constrictors (snakes) are capable of eating almost every type of land-dwelling vertebrate, so if a bird or mammal is already rare, a novel predator could tip the balance against the native prey species.[18] Ultimately, this could mean that entire food webs could change through the elimination or depletion of vulnerable native prey species.

Nonnative species may compete with native species for food and breeding habitat.[19] Moreover, they enjoy an advantage over native species in their new habitat because their natural enemies may not be in the area.[20] They can multiply unchecked, competing for valuable resources such as sunlight, water, and nutrients.[21] For example, a single Cuban Tree Frog can lay four thousand eggs at a time, three times more than native tree frogs in Florida.[22] Native species suffer from this intense competition from nonnative invaders. Invasive nonnative species "are the primary cause of species endangerment and have contributed to 68 percent of extinctions in the U.S."[23]

2. Physical Destruction of Habitat

Nonnative species can also alter the physical environment and modify or destroy natural habitats.[24] A prime example is the nutria, a

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food and space with overfished native stocks such as snapper and grouper. Scientists fear that lionfish will also kill off helpful species such as algae-eating parrotfish, allowing seaweed to overtake the reefs.").

16. *Giant Constrictor Risk Assessment: Frequently Asked Questions*, U.S. GEOLOGICAL SURV., http://www.fort.usgs.gov/FLConstrictors/FAQ.asp (last visited Oct. 7, 2011).

17. *See* Associated Press, *Gator-Guzzling Python Comes to Messy End*, MSNBC.COM (Oct. 5, 2005, 4:42:28 PM), http://www.msnbc.msn.com/id/9600151/.

18. Pimentel et al., *supra* note 6, at 10.

19. *Invasive Non-Native Species*, supra note 15.

20. *See id.*

21. *Id.*

22. SANDY BECK ET AL., NAT'L PARK SERV. & FLA. FISH & WILDLIFE CONSERVATION COMM'N, FLORIDA INVADERS: UNDER SIEGE BY PLANT AND ANIMAL INVADERS, NATURE AND OUR ECONOMY ARE AT RISK! 5 (2008), http://www.nps.gov/ever/naturescience/upload/2008%20Florida%20Invaders%20For%20Web.pdf.

23. *Nonnative Species: Burmese Pythons*, NAT'L PARK SERV., http://www.nps.gov/ever/naturescience/nonnativespecies.htm (last updated Aug. 13, 2010, 12:03 PM).

24. PETER T. JENKINS ET AL., DEFENDERS OF WILDLIFE, BROKEN SCREENS: THE REGULATION OF LIVE ANIMAL IMPORTS IN THE UNITED STATES 16 (2007), *available at* http://www.defenders.org/resources/publications/programs_and_policy/international_conservation/broken_screens/broken_screens_report.pdf.

South American semiaquatic rodent that has invaded parts of the U.S. Gulf Coast.[25] Like wild hogs, they burrow underground for food, which destabilizes the soil, uproots or weakens native vegetation, damages crops and lawns, and causes erosion on the banks of rivers and canals in the bayous of coastal Louisiana and other fragile ecosystems.[26]

B. Economic Waste

Economic losses resulting from invasive species are extensive. A 1999 study estimated that the fifty thousand invasive species contribute to approximately $137 billion per year in damages.[27] More recent commentaries suggest this was a conservative estimate, considering the study did not account for the invasive species damages reported to the U.S. Department of Agriculture Wildlife Services and underestimated populations of invasive swine.[28] Although there is extensive research and scholarship on the economic impacts of invasive species,[29] calculating precise values of economic loss can be prohibitively expensive. Investigators assessing past and projected economic damages associated with uncontrolled nutria populations in Maryland, for example, admitted that a precise tally would require additional resources in the thousands—if not millions—of dollars.[30] It is important to keep this in mind for the

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25. *Id.* at 15.

26. *Id.*; *see Hog Wild in Florida: UF Experts Say Feral Pig Problem Here To Stay*, SCI. DAILY (June 7, 2005), http://www.sciencedaily.com/releases/2005/06/050607012122.htm.

27. David Pimentel et al., *Environmental and Economic Costs of Nonindigenous Species in the United States*, 50 BIOSCIENCE 53, 53 (2000), *available at* http://www.tcnj.edu/~bshelley/Teaching/PimentelEtal00CostExotics.pdf.

28. David L. Bergman et al., *The Economic Impact of Invasive Species to Wildlife Services' Cooperators*, *in* NAT'L WILDLIFE RESEARCH CTR., U.S. DEP'T OF AGRIC., HUMAN CONFLICTS WITH WILDLIFE: ECONOMIC CONSIDERATIONS 169, 177 (Larry Clark ed., 2000), http://www.aphis.usda.gov/wildlife_damage/nwrc/symposia/economics_symposium/bergmanHR.pdf (citing Pimentel et al., *supra* note 27).

29. In fact, the USDA's National Invasive Species Information Center has web pages devoted to listing numerous studies of the economic impacts on national, state, and international levels. *See Economic Impacts*, U.S. DEP'T AGRIC., http://www.invasivespeciesinfo.gov/economic/us.shtml (last modified Sept. 21, 2011); Jeffrey Davis, *Invasive Exotic Animals Costing U.S. Billions of Dollars*, MOTHER NATURE NETWORK (Feb. 2, 2010, 6:49 PM), http://www.mnn.com/lifestyle/pets-animals/stories/invasive-exotic-animals-costing-us-billions-of-dollars; DAVID LODGE & DAVID FINNOFF, INVASIVE SPECIES IN THE GREAT LAKES: COSTING US OUR FUTURE: ANNUAL LOSSES TO GREAT LAKES REGION BY SHIP-BORNE INVASIVE SPECIES AT LEAST $200 MILLION (July 2008), http://www.glu.org/sites/default/files/lodge_factsheet.pdf. At the state level, most studies look at the impact of specific species. Most of these, however, are plant species, with the exception of a few dealing with specific animal species and geographic locations. *See, e.g.*, SOUTHWICK ASSOCS., MD. DEP'T OF NATURAL RES., POTENTIAL ECONOMIC LOSSES ASSOCIATED WITH UNCONTROLLED NUTRIA POPULATIONS IN MARYLAND'S PORTION OF THE CHESAPEAKE BAY (Nov. 2, 2004), http://www.dnr.state.md.us/irc/docs/00006595.pdf.

30. SOUTHWICK ASSOCS., *supra* note 29, at 1.

discussion later in this Article on economic valuation for public nuisance liability and the proposal for a cost recovery statute.

C. Criminal Activity

The illicit wildlife trafficking trade, second only to the drugs and weapons trade, has an estimated worth of $10 to $20 billion a year.[31] Many of the organized crime rings trafficking in drugs and arms are also linked to the illegal wildlife trade.[32] Demand fuels illegal wildlife trafficking. The worldwide markets for exotic pets, rare foods, trophies, and traditional medicines are expansive.[33] Traffickers can make a huge profit with little cost. Animals have been sold for as much as $10,000 each.[34] As long as markets exist in developed nations like the United States, exotic animals will be trafficked from the lesser-developed nations, legally or illegally. The United States is the largest importer of wildlife.[35] The U.S.-Mexico border is notoriously permeable for wildlife smuggling.[36] The demand for exotic species and large payoff for the traffickers creates opportunities for nonnative species introductions into the wild.[37]

D. Public Health and Personal Injury

Nonnative species in the United States detrimentally impact human health by spreading various infectious diseases and causing individual personal injuries.[38] Most live animals imported into the United States,

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31. Bergman, *supra* note 11, at 37; *Fighting Wildlife Trafficking*, COALITION AGAINST WILDLIFE TRAFFICKING, http://www.cawtglobal.org/usa/ (last visited Oct. 7, 2011).

32. Mara E. Zimmerman, *The Black Market for Wildlife: Combating Transnational Organized Crime in the Illegal Wildlife Trade*, 36 VAND. J. TRANSNAT'L L. 1657, 1659 (2003).

33. *Fighting Wildlife Trafficking*, *supra* note 31.

34. Amulya Nagaraj, *Illegal Wildlife Trade on the Rise; Stronger Punishment Needed for Offenders*, INT'L BUS. TIMES (Sept. 20, 2010, 6:10 AM), http://www.ibtimes.com/articles/63644/20100920/wildlife-conservation-cites-traffic-wwf-china-india-africa-malaysia.htm.

35. Zimmermann, *supra* note 32, at 1669 (citing Robert S. Anderson, *Investigation, Prosecution, and Sentencing of International Wildlife Trafficking Offenses in the U.S. Federal System*, NAT'L ENVTL. ENFORCEMENT J., June 1997, at 14, 14); *see CBP Assists Bo Derek in Fight Against Wildlife Trafficking in Miami*, U.S. DEP'T OF HOMELAND SEC. (Oct. 19, 2007), http://www.cbp.gov/xp/cgov/newsroom/highlights/border_sec_news/bo_derek.xml; David Fleshler & Dana Williams, *Wildlife Trade Brings Tarantulas, Pythons, Cobras*, SUN SENTINEL (Nov. 30, 2010), http://articles.sun-sentinel.com/2010-11-30/new/fl-wildlife-trade-20101130_1_pythons-import-limit-wildlife-trade.

36. Zimmermann, *supra* note 32, at 1670 (citing Anderson, *supra* note 35, at 14).

37. Robert Brown, *Exotic Pets Invade United States Ecosystems: Legislative Failure and a Proposed Solution*, 81 IND. L.J. 713, 715, 717 (2006) (citing Stefan Lovgren, *Huge, Freed Pet Pythons Invade Florida Everglades*, NAT'L GEOGRAPHIC NEWS, June 3, 2004, http://news.nationalgeographic.com/news/2004/06/0603_040603_invasivespecies.html).

38. *See* JENKINS ET AL., *supra* note 24, at 21-22.

eighty-two percent of which are nonnative to the United States,[39] are never tested for infectious agents.[40] Therefore, a significant proportion of the diseases that those animals harbor are also likely to be foreign.[41] Exotic pets have been linked to outbreaks of rare diseases in humans throughout the United States. For example, the 2003 outbreak of monkeypox in Wisconsin, Illinois, and Indiana was linked to a pet-trade shipment of a Gambian giant rat (*Cricetomys gambianus*).[42] Wild hogs in Florida are known to carry forty-five different parasitic and infectious diseases,[43] and the Great Green Tree frog, a large Australian frog, is known to carry the deadly pathogen *Batrachochytrium dendrobatidis*.[44] "Invasive Brown Tree Snakes and Black Spiny-tailed iguana deliver venomous bites."[45] Nonnative species kept as pets, or those that have escaped into the wild, have also been known to attack people in suburbs and cities.[46]

E. Impacts Compounded by Climate Change

The impacts described above may be compounded by the effects of climate change. Research indicates that tropical and subtropical species and diseases will move northward, as habitats in higher latitudes and at higher elevations become warmer and moister.[47] Scientists predict that the number of harmful species invasions will likely increase in a warming North America because tropical species will be able to acclimate more easily to the warmer winter.[48] Furthermore, as the

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39. *Id.* at 8 tbl.1.

40. *Id.* at 19.

41. *Id.*

42. CTR. FOR DISEASE CONTROL, PRELIMINARY REPORT: MULTISTATE OUTBREAK OF MONKEYPOX IN PERSONS EXPOSED TO PET PRAIRIE DOGS 1 (June 9, 2003), http://www.cdc.gov/ncidod/monkeypox/pdf/report060903.pdf.

43. Robert C. Belden, *Feral Hogs: The Florida Experience*, TEX. NAT. WILDLIFE, http://agrilife.org/texnatwildlife/feral-hogs/feral-hogs-the-florida-experience/ (last visited Sept. 29, 2011).

44. JENKINS ET AL., *supra* note 24, at 18.

45. *Frequently Asked Questions*, NAT'L INVASIVE SPECIES COUNCIL, http://www.invasivespecies.gov/ (follow "FAQ" hyperlink) (last visited Sept. 20, 2011).

46. *See, e.g.*, Jim Loney, *Pet Python Kills Florida Toddler*, REUTERS (July 1, 2009, 7:09 PM), http://www.reuters.com/article/idUSTRE56067K20090701.

47. Lawrence Liebesman et al., *The Endangered Species Act and Climate Change*, [Dec. 2009] 39 Envtl. L. Rep. (Envtl. Law Inst.) 11,173, 11,175-76 (citing Brief of Amici Curiae Wildlife Conservation Interests in Support of Petitioners at 19, Massachusetts v. EPA, 127 S. Ct. 1438 (2007) (No. 05-1120), 2006 WL 2563382, at *19; CURTIS PETZOLDT & ABBY SEAMAN, N.Y. STATE INTEGRATED PEST MGMT. PROGRAM, CLIMATE CHANGE EFFECTS ON INSECTS AND PATHOGENS (Feb. 21, 2006), http://www.climateandfarming.org/pdfs/FactSheets/III.2Insects.Pathogens.pdf).

48. *Id.*

normal ranges of species shift with changing climatic conditions, and some native species go extinct in their formerly hospitable ecosystems, it will become more difficult to determine whether a new species is "nonnative."[49] Assisted migration, a management tool to aid certain endangered and threatened species from becoming extinct, could challenge the notion of what is harmful to an ecosystem. Although assisted migration could lead to the relocated species becoming invasive, not all relocated species threaten the ecosystems into which they are introduced.[50]

These impacts of nonnative species in the United States, including ecological, financial, health, and criminal effects, compounded by the prospect of climate change, will form the "purposes" section of the proposed comprehensive statute. It is within this backdrop that our legal analysis begins.

II. A RUBRIC FOR CREATING A COMPREHENSIVE INVASIVE SPECIES STATUTE

As a launching point for a comprehensive invasive animal species statute, this Part will provide a rubric of specific factors that should be addressed by statute. There are a variety of rubrics for assessing the tools of an environmental statute. Common threads include prevention, enforcement, cost recovery and liability, and incentives.[51] Effective environmental regulations should be enforceable and consistent. Vague and inconsistent laws inhibit regulation, especially when more than one regulation applies to an individual activity.[52] As the review of current invasive species laws will reveal in Parts III and IV, current laws that address invasive species suffer from inconsistencies and vagueness. This Part will explain the elements needed to make an effective federal comprehensive statute to regulate the spread of invasive species.

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49. JENKINS ET AL., *supra* note 24, at 18.

50. *See* Julie Lurman Joly & Nell Fuller, *Advising Noah: A Legal Analysis of Assisted Migration*, [May 2009] 39 Envtl. L. Rep. (Envtl. Law Inst.) 10,413, 10,415.

51. *See* ENVTL. LAW INST., INVASIVE SPECIES CONTROL: A COMPREHENSIVE MODEL STATE LAW (2004), *available at* http://www.nobanis.org/files/model-law.pdf; CLAIRE SHINE ET AL., IUCN-THE WORLD CONSERVATION UNION, A GUIDE TO DESIGNING LEGAL AND INSTITUTIONAL FRAMEWORKS ON ALIEN INVASIVE SPECIES (2000), *available at* http://data.iucn.org/dbtw-wpd/edocs/EPLP-040-En.pdf; U.S. ENVTL. PROT. AGENCY (EPA), ELEMENTS OF EFFECTIVE ENVIRONMENTAL LAWS: FACILITATOR'S MANUAL (2005) (on file with author).

52. ANDREW FARMER, HANDBOOK OF ENVIRONMENTAL PROTECTION & ENFORCEMENT: PRINCIPLES & PRACTICE 12 (2007).

A. Prevention

Over time, "preventing the introduction and establishment of invasive species is the most effective and cost-efficient strategy."[53] Once an invasive species becomes widespread, controlling it can require significant and sustained expenditures.[54] The International Union of Conservation of Nature (IUCN) advises that "prevention" should apply "to activities that may have serious adverse effects on the environment."[55] While it does not impose an absolute duty to prevent all harm, there is a requirement "to exercise due diligence and act reasonably and in good faith in prohibiting or regulating activities that could have such results."[56] The IUCN distinguishes between preventing intentional introductions and unintentional introductions.[57] A successful prevention strategy will be multifaceted and sensitive to the different sources of invasive species.

There are a variety of statutory options for preventing introduction. First, the risk associated by the introduction of an invasive species needs to be identified and assessed to determine whether the impact is acceptable or unacceptable. This process involves collecting and analyzing scientific data to describe the risk and evaluate its likelihood under a given set of circumstances.[58] Laws and regulations should then provide procedures to prevent activities that lead to unacceptable risks.[59] In the case of intentional introductions, prevention may take the form of total prohibition or partial prohibition, such as conditional permit requirements. Prevention for unintentional introductions should entail identifying and controlling common introduction pathways through controls such as quarantine systems and ballast water regulations.[60]

Two types of lists organize risks. A "dirty list" identifies species as invasive or harmful and forbids their introduction or proliferation.[61] While a dirty list approach is straightforward, it is reactive; it cannot anticipate or prevent invasive problems caused by species not yet on the list.[62] Alternatively, a "clean list" includes only species that may be introduced or proliferated without restriction.[63] The advantage to a clean

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53. ENVTL. LAW INST., *supra* note 51, at 3.
54. NAT'L INVASIVE SPECIES COUNCIL, *supra* note 15, at 11.
55. SHINE ET AL., *supra* note 51, at 33.
56. *Id.*
57. *See id.* at 5-7.
58. ENVTL. LAW INST., *supra* note 51, at 3; EPA, *supra* note 51, at 17.
59. EPA, *supra* note 51, at 18.
60. SHINE ET AL., *supra* note 51, at 7-8.
61. ENVTL. LAW INST., *supra* note 51, at 7.
62. *Id.*
63. *Id.*

list approach is that it better prevents introductions of potentially invasive species with unknown characteristics and places "the burden on those who wish to import, introduce or otherwise handle [nonnative] species to demonstrate that the species are not invasive."[64] Seizures, quarantines, permits, and education programs are also tools for prevention.[65]

Although there are several federal laws that aim to prevent the spread of invasive species, such as the Lacey Act and National Invasive Species Act, they are lax when compared with frameworks in other parts of the world.[66] New Zealand's Biosecurity Act of 1993 has extensive provisions regarding the importation of risk organisms and inspections.[67] The Biosecurity Act also extensively addresses surveillance and prevention, including a duty to inform authorities of certain notifiable organisms.[68] At the time of this writing, an amendment has been introduced to improve the Act's risk assessment process and provide a new framework for risk profiling, among other changes.[69] A comprehensive federal invasive species statute should include as much detail as New Zealand's law.

B. Punishment

Punishment is another crucial piece of the regulation rubric because without meaningful consequences, there is little incentive to comply with laws.[70] Punishment should be strong enough to deter the regulated behavior and deliver environmental compliance, reach enough violators to pose a credible threat, and impose sufficient penalties.[71] The punishment must also be sensitive to the scope of the infraction and the defendant's mens rea.[72] Large-scale commercial importation of invasive species, including negligent or reckless actions, should entail particularly

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64. *Id.*

65. *Id.* at 5.

66. *See* Biosecurity Act 1993 (N.Z.). While Ireland does not have legislation on the subject, it has a detailed risk assessment program. *See Risk Assessment*, INVASIVE SPECIES IR., http://invasivespeciesireland.com/toolkit/risk-assessment/ (last visited Oct. 7, 2011).

67. *See* Biosecurity Act 1993 (N.Z.). Risk Organisms are defined as "the full range of organisms that could pose a threat to the values we wish to protect, and that may be managed under this policy." *Policy for MAF's Responses to Risk Organisms*, BIOSECURITY N.Z. 30 (July 2008), http://www.biosecurity.govt.nz/files/biosec/consult/response-policy-risk-organisms.pdf.

68. *See* Biosecurity Act 1993 (N.Z.).

69. *See Amendments to the Biosecurity Act 1993*, BIOSECURITY N.Z., http://www.biosecurity.govt.nz/biosec/pol/biosecurity-act-review (last updated Dec. 20, 2010); Biosecurity Law Reform Bill 2010, 256-1 (N.Z.), *available at* http://www.legislation.govt.nz/bill/government/2010/0256/3.0/viewpdf.aspx (follow "Download PDF" hyperlink).

70. ENVTL. LAW INST., *supra* note 51, at 8.

71. FARMER, *supra* note 52, at 15-16.

72. *Id.*

stiff administrative and criminal penalties to discourage those actions.[73] On the other hand, violators who have not been put on notice should not be severely penalized. For example, a person who bought an exotic fish for their aquarium in one state and finds out it is illegal in another state should not endure the full weight of civil or criminal penalties.[74] Punishment tools include civil and criminal penalties and fines.[75] The review of federal invasive species laws reveals that, although various penalties exist,[76] enforcement is not always sensitive or tempered to the source of the problem.[77] A fair punishment regime must have appropriate penalties for crimes.

C. Restoration, Cost Recovery, and Liability

A complete invasive species regulatory scheme must include a plan for restoration and recovery of an ecosystem harmed by a certain invasive species. This may include biocontrol, using one organism to control another, or eradication, the extermination of a species in a certain area.[78] To fund this restoration, persons liable for the spread of the invasive species, if they can be identified, should contribute to the cost of recovery. Imposing cost recovery liability applies the "polluter pays" principle and serves as a deterrent.[79] To develop a liability regime, several issues need to be determined, including: (1) which actors should be liable, i.e., transporters, consumers, disposers, or others; (2) which standards should be used for determining liability, i.e., strict liability or a balancing test; and (3) the ways liability should be measured, whether it includes environmental cleanup or natural resource restoration.[80]

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73. ENVTL. LAW INST., *supra* note 51, at 8.

74. *Id.*

75. *Id.*

76. *See* Lacey Act, 16 U.S.C. § 3373 (2006); 18 U.S.C. § 42(b) (2006); Endangered Species Act, 16 U.S.C. § 1540 (2006); Clean Water Act, 33 U.S.C. § 1319(g) (2006).

77. *See* United States v. McNab, 331 F.3d 1228 (11th Cir. 2003) (affirming two- and three-year prison sentences for importing lobster tails that were not properly inspected prior to shipment as well as money laundering).

78. *See* Bryan Arroyo, Assistant Dir., Fisheries & Habitat Conservation, U.S. Fish & Wildlife Serv., Presentation at the International Symposium on Genetic Biocontrol of Invasive Fish 9-11 (June 21-24, 2010), http://www.seagrant.umn.edu/downloads/biocontrol/Genetic_Biocontrol_of_Invasive_Fish-US_FWS-Bryan_Arroyo.pdf; *Management Methods: Biological Control*, U.S. FISH & WILDLIFE SERV., http://www.fws.gov/invasives/staffTrainingModule/methods/biological/introduction.html (last updated Feb. 18, 2009). For a series of papers on the eradication of various invasive species on islands, see IUCN, TURNING THE TIDE: ERADICATION OF INVASIVE SPECIES: PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON ERADICATION ON ISLAND INVASIVES (C.R. Veitch & M.N. Clout eds., 2002), *available at* http://www.hear.org/articles/turningthetide/turningthetide.pdf.

79. EPA, *supra* note 51, at 27.

80. *Id.*

However, proving ecosystem damage or economic damages may be difficult because of the time lag between introduction and damage, as well the difficulty in identifying the exact source of an invasive species introduction.[81] This problem could potentially be addressed by holding the person or parties, who benefit commercially from the activity or process that generates the pollution for the cost of pollution, liable prevention and control measures.[82] On the other hand, some scholars argue that the cost recovery approach is inappropriate for invasive species harm because the invasion and harm may be ongoing and not limited to a single site or occurrence.[83] Nevertheless, due to the severe economic impacts of invasive species, this method should be explored as part of a comprehensive statute.

There is currently no cost recovery scheme for invasive species on a national level. On a state level, at least six states have begun to require the payment of a bond or demonstration of liability insurance in order to possess specified species.[84] New York plans to include a cost recovery scheme in its regulatory framework to recover "response costs and other natural resource damages resulting from illegal trafficking in invasive species."[85] Other federal statutes such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Oil Pollution Act (OPA) provide detailed cost recovery schemes for natural resource damages from pollutants, which can serve as a framework for invasive species damages cost recovery.[86]

D. Incentives

Another type of mechanism to regulate invasive species is through incentives and voluntary based efforts. Governments can provide incentives through tax credits, funding grant programs, and by giving special recognition to businesses that exceed standards.[87] In an invasive species regulatory system, an incentive could be a bounty to reward payment to those who catch or destroy invasive species.[88] For an effective

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81. SHINE ET AL., *supra* note 51, at 82.
82. *Id.* at 34.
83. *Id.* at 34-35.
84. ENVTL. LAW INST., *supra* note 51, at 9.
85. N.Y. INVASIVE SPECIES COUNCIL, A REGULATORY SYSTEM FOR NON-NATIVE SPECIES 10 (June 10, 2010), http://www.agmkt.state.ny.us/PI/Regulatory_System_for_Non-native_Species.pdf.
86. *See* Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9607 (2006); Oil Pollution Act, 33 U.S.C. § 2702 (2006).
87. EPA, *supra* note 51, at 30.
88. SHINE ET AL., *supra* note 51, at 75.

system, there would need to be "clear legal parameters, backed by some kind of quantitative commitments and compliance criteria."[89] The incentive must be sufficient to attract enough people to take up the offer and have a substantial effect on the target species population.

At the same time, the incentive must not be too high as to create "a perverse incentive to slow down the control rate to ensure the continued supply of the lucrative organism."[90] For example, Samoa introduced a bounty system in the 1980s to control the African snail, offering a few cents per snail killed.[91] The program "was halted when it was found that snails were being bred for this purpose."[92] In the United States, there are grant programs for specific species on the federal level and more generally on the state level, but no broad incentive program in federal law.[93]

Thus, the elements of prevention, enforcement, cost recovery, and incentives have the potential to all be used as tools to regulate invasive species. The following Parts of this Article will evaluate existing federal laws to see if and how they fit into this rubric, and identify regulations that could be developed to fulfill these factors.

III. ASSESSMENT OF CURRENT FEDERAL INVASIVE NONNATIVE SPECIES LAW

The main federal invasive species laws are the Lacey Act and Executive Order 13,112.[94] While these mechanisms have tools for prevention and enforcement, they lack cost recovery and incentive tools. The Lacey Act is reactive instead of proactive, and Executive Order 13,112 does not have the force of law.[95] Other laws deal with a narrow scope of invasive species regulation. This Part will examine these statutory frameworks and evaluate their effectiveness. The analysis will underscore the need for a federal comprehensive invasive nonnative species statute that has provisions for prevention, liability, enforcement, and incentives.

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89. *Id.*
90. *Id.*
91. *Id.*
92. *Id.*
93. *See* Nutria Eradication and Control Act of 2003, Pub. L. No. 108-16, 117 Stat. 621 (2003).
94. Lacey Act, 16 U.S.C. §§ 3371–3378 (2006); Exec. Order No. 13,112, 64 Fed. Reg. 6183 (Feb. 8, 1999).
95. *See* Exec. Order No. 13,112, 64 Fed. Reg. at 6186 (stating that the executive order is not "enforceable at law" against the United States).

A. Lacey Act

The Lacey Act is the United States' oldest federal conservation law and is the first line of defense against the trade of nonnative species. However, critics have bemoaned the 110-year-old statute as ineffective.[96] This Part will discuss the Lacey Act's history, statutory framework, and its effectiveness.

1. Purpose of the Lacey Act

John Lacey, an Iowa Congressman and trusted friend of Theodore Roosevelt,[97] first introduced the Lacey Act to the United States House of Representatives in 1900 citing threats of excessive hunting and harmful nonnative species displacing native populations of birds.[98] The original intent of the Lacey Act was "(1) to authorize the introduction and preservation of game, song, and insectivorous wild birds, (2) to prevent the 'unwise' introduction of foreign birds and animals, and (3) to supplement state laws for the protection of game and birds."[99] The Lacey Act "authorized the Department of Agriculture to assist with the

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96. *See, e.g.*, Marc L. Miller, *The Paradox of U.S. Alien Species Law*, *in* ENVTL. LAW INST., HARMFUL INVASIVE SPECIES: LEGAL RESPONSES 125, 133-35 (Marc L. Miller & Robert N. Fabian eds., 2004); Andrea J. Fowler et al., *Failure of the Lacey Act To Protect US Ecosystems Against Animal Invasions*, 5 FRONTIERS ECOLOGY & ENV'T 353 (2007), *available at* http://nd.edu/~lodgelab/Lodge_Lab_Website/Research_files/Failure%20of%20the%20Lacey%20Act%20to%20protect.pdf; Jared A. Goldstein, *Aliens in the Garden*, 80 U. COLO. L. REV. 685, 715-18 (2009); Laura T. Gorjanc, *Combating Harmful Invasive Species Under the Lacey Act: Removing the Dormant Commerce Clause Barrier to State and Federal Cooperation*, 16 FORDHAM ENVTL. L. REV. 111 (2004); Julianne Kurdila, Comment, *The Introduction of Exotic Species into the United States: There Goes the Neighborhood!*, 16 B.C. ENVTL. AFF. L. REV. 95 (1988).

97. *John F. Lacey, Theodore Roosevelt's Right-Hand Man*, THEODORE ROOSEVELT CONSERVATION PARTNERSHIP, http://trcpsquaredealer.org/reflections/john_f._lacey_theodore_roosevelts_right-hand_man/ (last visited Oct. 8, 2011).

98. Robert S. Anderson, *The Lacey Act: America's Premier Weapon in the Fight Against Unlawful Wildlife Trafficking*, 16 PUB. LAND L. REV. 27 (1995) (citing 33 CONG. REC. 4871-72 (1900) (statement of Rep. John Lacey)).

99. *Id.* at 37 (citing H.R. REP. NO. 56-474, at 1-2 (1900)); *see also* United States v. Condict, No. CR-05-004-SPS, 2006 U.S. Dist. LEXIS 43826 (E.D. Okla. June 27, 2006). Several district courts have altered the scope of the statute's original intent, looking at the congressional history for the 1969 Lacey Act amendment to interpret the Lacey Act's purpose. Instead of the original purpose to prevent unwise introductions, the focus has shifted "to protect 'those species of fish and wildlife whose continued existence is presently threatened' by 'gradually drying up the international market for endangered species,' thus 'reducing the poaching of any such species in the country where it is found.'" United States v. Bernal, 90 F.3d 465, 467 (11th Cir. 1996) (quoting S. REP. NO. 91-526, at 3 (1996)).

reintroduction of game birds and other wild birds where they had become locally scarce or extinct."[100]

2. Statutory Framework

There are two separate statutory sections under the umbrella of the Lacey Act, 16 U.S.C. §§ 3371-3377 and 18 U.S.C. § 42.

a. 16 U.S.C. § 3372

This provision makes it unlawful for any person to import, export, or transport "any fish or wildlife" or "any plant" that is made illegal by "any law, treaty or regulation of the United States," any Indian tribal law, or any state or foreign law.[101] It also enforces international treaties to which the United States is a party. For example, it enforces the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which "established a permit system to place trade restrictions on three categories of threatened and endangered plant and animal species."[102]

Because state, foreign, and international laws, treaties, and regulations fall under § 3372, the statute's scope is broad. For example, in *United States v. Condict*, a defendant was found guilty under § 3372(a) for purchasing and receiving domestic white tailed deer, in violation of Oklahoma law.[103] In other cases, Lacey Act violations have been found where shellfish harvesting violated South African, Honduran, or Russian law.[104] Courts have found that foreign regulations are also applicable as foreign laws under the Lacey Act.[105] On the other hand, at least one court has found no Lacey Act violation where a regulation was unpublished.[106] In *United States v. Cannon*, the defendant killed a coyote on Edwards Air Force Base in violation of the unpublished Air Force

100. Anderson, *supra* note 98, at 37 (citing H.R. REP. NO. 56-474, at 1 (1900); Lacey Act, ch. 553, 31 Stat. 187, 188 (1900)).

101. Lacey Act, 16 U.S.C. § 3372 (2006).

102. United States v. Kum, 309 F. Supp. 2d 1084, 1085 (E.D. Wis. 2004).

103. 2006 U.S. Dist. LEXIS 43826; *see also* United States v. Tierney, 38 F. App'x 424 (9th Cir. 2002) (affirming the district court's application of Nevada state law).

104. United States v. Bengis, 631 F.3d 33 (2d Cir. 2011) (holding that defendant violated South African lobster law); United States v. 144,774 Pounds of Blue King Crab, 410 F.3d 1131 (9th Cir. 2005) (holding that importer violated Russian law); United States v. McNab, 331 F.3d 1228 (11th Cir. 2003) (holding that defendant violated Honduran lobster regulation).

105. *See, e.g.*, United States v. Lee, 937 F.2d 1388, 1392 (9th Cir. 1991) (holding that a Taiwanese fishing regulation constituted "foreign law"); United States v. 594,464 Pounds of Salmon, 871 F.2d 824, 828 (9th Cir. 1989).

106. *See* United States v. Cannon, 345 F. App'x 301 (9th Cir. 2009).

Flight Test Center Instruction 32-8.[107] Since the regulation was unpublished and the record was insufficient to show that the defendant had actual notice of the base hunting regulations, the Lacey Act did not apply.[108]

b. 18 U.S.C. § 42

The other section of the Lacey Act, 18 U.S.C. § 42, lists a limited number of forbidden species.[109] These species can only be imported into the United States if the importer has a permit from the United States Fish and Wildlife Service (Service). The Service implements the injurious wildlife provisions (18 U.S.C. § 42) through regulations contained in 50 C.F.R. part 16 to prevent the listed species' introduction or establishment through human movement in the United States. The list aims to protect the health and welfare of humans, the interests of agriculture, horticulture and forestry, and the welfare and survival of wildlife resources from potential and actual negative impacts of the species.[110]

> The Service considers a variety of factors when evaluating [whether a species should be listed] as injurious[, including: (1)] species' survival capabilities and ability to spread geographically[, (2)] its impacts on habitats and ecosystems, threatened and endangered species, and human beings and resource-based industries[, and (3)] resource managers' ability to control and eradicate the species.[111]

The Service reviews scientific data for factors contributing to injuriousness and factors that reduce or remove injuriousness. A variety of economic analyses are also conducted to determine the economic impacts of potential rulemakings.[112] Currently, there is a petition in the notice and comment period to add nine species of snakes to the list of injurious species to "prohibit the importation of any live animal, gamete,

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107. *Id.* at 302.

108. *Id.* at 303.

109. Lacey Act, 18 U.S.C. § 42 (2006); *see Species Listed as Injurious Wildlife Under the Lacey Act (50 CFR 16)*, U.S. FISH & WILDLIFE SERV. (Sept. 29, 2011), http://www.fws.gov/fisheries/ans/Current_Listed_IW.pdf.

110. *Injurious Wildlife: A Summary of the Injurious Provisions of the Lacey Act (18 U.S.C. 42; 50 CFR 16)*, U.S. FISH & WILDLIFE SERV. (June 2010), http://www.fws.gov/fisheries/ans/pdf_files/InjuriousWildlifeFactSheet2010.pdf [hereinafter *Injurious Wildlife*]. According to 18 U.S.C. § 42(a)(3), "importation for zoological, educational, medical, and scientific purposes of any mammals, birds, fish (including mollusks and crustacea), amphibia, and reptiles, or the offspring or eggs thereof," may be permitted by the Secretary of the Interior "where such importation would be prohibited otherwise by or pursuant to this Act, and this Act shall not restrict importations by Federal agencies for their own use."

111. *Injurious Wildlife*, *supra* note 110, at 2.

112. *Id.*

viable egg, or hybrid of these nine constrictor snakes into the United States, except as specifically authorized."[113]

A species can only be added to the injurious species list through the bulky rulemaking process. A 2007 study showed that the average time for a species to be listed has increased to over four years, and only one species has been added by petition in the past decade.[114] Considering the variety of new nonnative species arriving in the United States on a constant basis, this is a startlingly low number. For example, two genera of snakehead fish were listed as injurious wildlife in October 2002.[115] By the time they were listed, the snakeheads already invaded the Potomac River in Maryland and Virginia, and had "spread beyond the possibility of eradication."[116] Furthermore, the idea of listing forbidden animals on a "dirty list" assumes that there is adequate information to know when a species will cause harm. But, it does not authorize the exclusion of animals whose threat is unknown.[117]

c. Authority for Enforcement

The Lacey Act gives enforcement authority to the Secretary of Interior, the Secretary of Transportation, or the Secretary of the Treasury, who may with or without reimbursement, use the personnel, services, and facilities of any other federal agency or any state agency or Indian tribe.[118] The Service has broad authority to detain and inspect any international shipment, mail parcel, vehicle, or passenger baggage and all accompanying documents, whether or not wildlife has been formally declared.[119] According to the Service, "[W]ildlife inspectors are stationed at 38 major U.S. airports, ocean ports, and border crossings, where they monitor imports and exports to ensure compliance with U.S. laws and regulations."[120] In 1999, for example, Service special agents worked on more than fifteen hundred Lacey Act investigations.[121]

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113. Injurious Wildlife Species; Listing the Boa Constrictor, Four Python Species, and Four Anaconda Species as Injurious Reptiles, 75 Fed. Reg. 11,808, 11,808 (Mar. 12, 2010).

114. Fowler et al., *supra* note 96, at 353.

115. *See Invasive Species Program—Snakeheads, Aquatic Invaders*, U.S. GEOLOGICAL SURV. (July 2004), http://www.fws.gov/fisheries/ans/pdf_files/Snakeheads.pdf.

116. JENKINS ET AL., *supra* note 24, at 27.

117. *See* Brown, *supra* note 37, at 719.

118. Lacey Act, 16 U.S.C. § 3375(a) (2006).

119. *Id.* § 3375(b).

120. *Injurious Wildlife*, *supra* note 110, at 2.

121. *Nation Marks Lacey Act Centennial, 100 Years of Federal Wildlife Law Enforcement*, U.S. FISH & WILDLIFE SERV. (May 30, 2000), http://www.fws.gov/pacific/news/2000/2000-98.htm.

d. Penalties Under the Lacey Act

Penalties under the Lacey Act are fixed. The Act provides for both civil and criminal penalties of a modest nature, e.g., knowingly or negligently violating the Act may result in a civil penalty of "not more than $10,000 for each such violation" and criminal penalties, up to five years in prison and a $20,000 fine for each violation of 16 U.S.C. § 3372(a) or (c).[122] In contrast to 16 U.S.C. § 3373, the penalties for 18 U.S.C. § 42(b) are lighter, including fines, imprisonment for not more than six months, or both. Additionally, "all fish or wildlife [or] plants imported, exported, transported, sold, received, acquired, or purchased contrary to the provisions of section 3372," other than subsection (b), or contrary to corresponding regulations, must be subject to forfeiture.[123]

3. Assessment of the Lacey Act's Effectiveness

The effectiveness of the Lacey Act is limited, and does not fulfill the rubric for a comprehensive invasive species statute.

a. Prevention

The Lacey Act is not a strong tool for prevention. The listing process of injurious wildlife is long, and is reactive to a problem rather than proactive.[124] By the time a species is petitioned for listing, the species is already a serious problem. For example, Burmese pythons were documented in the Everglades by the 1980s.[125] Only after the public was energized by a news story of a python attacking a toddler in 2009 was the idea of listing pythons as injurious species under the Lacey Act discussed.[126] As of March 2011, the Service's proposed listing of nine of these large snakes as injurious species under the Lacey Act is still undergoing administrative review, and the introduced legislation in the

122. 16 U.S.C. § 3373.

123. *Id.* § 3374(a)(1).

124. *How To Constrict Snakes and Other Invasive Species: Oversight Hearing Before the Subcomm. on Nat'l Parks, Forests, & Pub. Lands & the Subcomm. on Insular Affairs, Oceans & Wildlife of the House Natural Res. Comm.*, 111th Cong. 3 (2010) (statement of Professor Daniel Simberloff, University of Tennessee).

125. *Nonnatives: Burmese Python*, FLA. FISH & WILDLIFE CONSERVATION COMM'N, http://myfwc.com/wildlifehabitats/nonnatives/reptiles/burmese-python/ (last visited Sept. 30, 2011).

126. *See 8.5-Foot Python Strangles Toddler*, CLICK ORLANDO (July 1, 2009), http://www.clickorlando.com/news/19914383/detail.html.

House of Representatives and Senate is still pending.[127] Meanwhile, the South Florida Water Management District recently reported that the python problem in the Everglades is worsening.[128] The District removed six pythons in February and March 2011 from territories previously thought to be uninvaded, including areas deep in the Everglades.[129] This illustrates how the Lacey Act's drawn out listing process is defective.

Furthermore, the listing process can be duplicative in some cases. While a species remains in limbo waiting to be listed as an injurious species under 18 U.S.C. § 42, a state could pass a law, thus triggering the provisions of 16 U.S.C. § 3372. For example, a 2010 Florida state law banned any person, party, firm, association, or corporation from keeping, possessing, importing, selling, bartering, trading, or breeding several varieties of pythons for personal use.[130] The snakes listed in the Florida statute are almost the same as the ones listed in the introduced federal legislation. The penalties under 16 U.S.C. § 3373 are more severe than 18 U.S.C. § 42. However, the national listing is still important where a species poses a risk between state boundaries and a single state's law does not apply. For example, if Burmese pythons potentially invaded Georgia, the Florida law that applies under 16 U.S.C. § 3373 would not be triggered.[131]

Additionally, once a species is listed as injurious under the Lacey Act, that species' population in the United States does not necessarily decrease. A study showed that out of seven species established by the time of listing, at least five have spread to additional states since the listing.[132] On the other hand, none of the seven species absent from the country at the time of listing subsequently established populations.[133] Two of the species that were present only in captivity (raccoon dog and brushtail possum) did not establish wild populations.[134]

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127. *See Invasive Species Week 2011*, AUDUBON OF FLA. ADVOC. (Mar. 4, 2011), http://fl.audubonaction.org/site/MessageViewer?em_id=11341.0&printer_friendly=1; Fowler et al., *supra* note 96.

128. *See* Press Release, S. Fla. Water Mgmt. Dist., Pythons Persist in Everglades Through Freezes and Water Shortage (Mar. 26, 2011), http://www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/nr_2011_0326_python_finds.pdf.

129. *Id.*

130. FLA. STAT. § 379.372(2)(a) (2011).

131. *See* 16 U.S.C. § 3373 (2006).

132. Fowler et al., *supra* note 96, at 357.

133. *Id.*

134. *Id.*

b. Enforcement

Because the Lacey Act enforces laws and regulations from such a large variety of sources, there is no clear guidance as to what specific species are forbidden. As a result, defendants have challenged prosecutions under the Lacey Act when the law was not readily accessible and or unconstitutionally vague.[135] For example, a defendant challenged a Nevada law because the term "wildlife" did not distinguish whether it applied to indigenous or nonindigenous wildlife.[136] However, the court held that the statute was not unconstitutionally vague.[137] The issue of notice has been challenged in several cases, as well.[138] Courts have held that the government must prove that the defendant knew "that the fish or wildlife or plants were taken, possessed, transported, or sold in violation of, or in a manner unlawful under, any underlying law, treaty or regulation."[139] This second requirement of knowledge is satisfied if the person knows that the possession, etc., violated any law, without regard to whether the person knows which law it violated.[140] This is an example of enforcement that is susceptible to vagueness and ambiguity.

The monetary fines and penalties of the Lacey Act are comparable to New Zealand's penalties. However, New Zealand distinguishes between fines for individuals and corporations; higher fines for corporations (up to $200,000) exceed anything available in the Lacey Act.[141]

c. Cost Recovery and Incentives

While the Lacey Act does have a forfeiture provision, it lacks a cost recovery mechanism.[142] Additionally, it does not promote voluntary actions to curb the spread of invasive species, or other incentives to

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135. United States v. Tierney, 38 F. App'x 424, 425-26 (9th Cir. 2002) (holding that the meaning of "wildlife" as used in Nevada Administrative Code § 504.471 is not unconstitutionally vague because when read in conjunction with the Nevada Revised Statutes, "it is clear that 'wildlife' includes all wildlife, 'whether indigenous to Nevada or not'").

136. *Id.* at 425.

137. *Id.* at 425-26.

138. United States v. Cannon, 345 F. App'x 301 (9th Cir. 2009); *see also* United States v. 144,774 Pounds of Blue King Crab, 410 F.3d 1131 (9th Cir. 2005); United States v. McNab, 331 F.3d 1228 (11th Cir. 2003); *Tierney*, 38 F. App'x 424.

139. 16 U.S.C. § 3373(d)(1) (2006); United States v. Santillan, 243 F.3d 1125, 1129 (9th Cir. 2001).

140. *Santillan*, 243 F.3d at 1129; *see also* United States v. Seaton, Nos. 8:08CR372, 8:08CR374, 2009 U.S. Dist. LEXIS 88709 (D. Neb. Sept. 25, 2009).

141. *See* Biosecurity Act 1993 § 157 (N.Z.).

142. *See* Lacey Act, 18 U.S.C. § 42 (2006).

restore an ecosystem from the damage caused by the release of an invasive species.

In sum, there are a number of ways in which the Lacey Act falls short. The Lacey Act's dirty list is reactive instead of proactive, only listing a species once it is too late. Furthermore, the Lacey Act does not place people on notice of laws in other countries and states that trigger the Lacey Act. It neither includes robust preventative measures, such as a full risk assessment process to keep invasive species from spreading, nor a response and cleanup mechanism to restore ecosystems once they have been harmed. Thus, the Lacey Act is not currently adequate to fully alleviate the problems caused by invasive species.

B. Executive Order 13,112

President Bill Clinton issued Executive Order 13,112 in 1999 to create a national framework for invasive species management.[143] The following analysis will demonstrate that while the Executive Order created a management framework for solving invasive species problems, it lacks the strength to command specific actions by individuals outside the purview of the federal government. It mandated "[e]ach Federal agency whose actions may affect the status of invasive species" to identify actions,

> subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them.[144]

Federal agencies are broadly defined in the Executive Order as an executive department or agency, not including independent establishments.[145] Thus, as long the federal agencies' actions "may affect the status of invasive species," they are covered under the Executive Order's umbrella mandate.[146]

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143. *See* Exec. Order No. 13,112, 64 Fed. Reg. 6183 (Feb. 8, 1999).
144. *Id.* at 6184.
145. *Id.* at 6183.
146. *Id.* at 6184.

1. Onus on Federal Agencies To Prevent Spread of Invasive Species

The Executive Order provides that federal agencies shall "not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere."[147] An exception permits action where the agency has determined that "the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions."[148]

2. Creation of a National Invasive Species Council

The Executive Order also established the National Invasive Species Council (Council) as a high-level, interdepartmental organization to provide leadership, planning, and coordination for current federal programs.[149] The executive order mandated that the members shall include the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Transportation, and the Administrator of the Environmental Protection Agency. The Council shall be cochaired by the Secretary of the Interior, the Secretary of Agriculture, and the Secretary of Commerce.[150] The Secretary of Interior shall provide staff and administrative support to the Council, as well as appoint an Executive Director.[151] The Council has a broad mandate to "oversee the implementation of [the] order and see that the Federal agency activities [targeting] invasive species are coordinated, complementary, cost-efficient, and effective, relying to the extent feasible and appropriate on existing organizations addressing invasive species."[152] The Council focuses on increasing cooperation and coordination among different governmental actors, including the encouragement of "planning and action at local, tribal, State, regional, and ecosystem-based levels [and developing] recommendations for international cooperation in addressing invasive species."[153]

147. *Id.*
148. *Id.*
149. *See id.*
150. *Id.*
151. *Id.*
152. *Id.*
153. *Id.* at 6185.

3. Effectiveness of the Executive Order

Executive Order 13,112 explicitly states: "This order is intended only to improve the internal management of the executive branch and is not intended to create any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies, its officers, or any other person."[154] As a result, the order does not empower any party to mandate that certain actions are done. For example, the Executive Order states that the Council must "develop, in consultation with the Council on Environmental Quality [CEQ], guidance to Federal agencies pursuant to the National Environmental Policy Act [NEPA] on prevention and control of invasive species, including the procurement, use, and maintenance of native species as they affect invasive species."[155] A thorough review reveals that as of April 15, 2011, this guidance has not been completed. In fact, in 2009, the National Environmental Coalition on Invasive Species wrote a letter to Nancy Sutley of the CEQ, requesting that action be taken to draft this guidance.[156] As of yet, it has not been drafted.

While Executive Order 13,112 is helpful for coordination and management purposes, it is only a procedural and not a substantive tool. The lack of legal redress available, as detailed in the Executive Order, underlines its inability to be a catalyst for change. The fact that the CEQ NEPA guidance has not been written in over ten years is a symptom of the Executive Order's lack of utility. Furthermore, the Executive Order does not articulate funding mechanisms for programs, and states broadly that the programs are "subject to the availability of appropriations."[157]

C. National Invasive Species Act

On October 26, 1996, Congress enacted the National Invasive Species Act (NISA).[158] A misnomer, NISA amended the Nonindigenous

154. *Id.* at 6186.

155. *Id.* at 6185.

156. *See NECIS Sends Letter to Chair of CEQ About Guidance on Invasives*, NAT'L ENVTL. COAL. ON INVASIVE SPECIES (Feb 24, 2009), http://www.necis.net/2009/02/necis-sends-letter-to-chair-of-ceq-about-guidance-on-invasives/.

157. Exec. Order No. 13,112, 64 Fed. Reg. at 6184.

158. National Invasive Species Act of 1996, Pub. L. No. 104-332, 110 Stat. 4073 (codified as amended at 16 U.S.C. §§ 4701-4751 (2006)). The Act noted the continuing problem of aquatic nuisance species (ANS) and found that, "[I]f preventative management measures are not taken nationwide to prevent and control unintentionally introduced nonindigenous aquatic species in a timely manner, further introductions and infestations of species that are as destructive as, or more destructive than, the zebra mussel . . . may occur." 16 U.S.C. § 4701(a)(13).

Aquatic Nuisance Prevention Control Act of 1990 and only applies to aquatic nuisance species (ANS).[159] NISA defines ANS as "nonindigenous species that threaten[] the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural or recreational activities dependent on such waters."[160]

1. NISA Mechanisms for Prevention and Regional Coordination

NISA includes mechanisms for voluntary guidelines, monitoring, and risk assessment.[161] First, NISA directs the Coast Guard to implement voluntary national guidelines for ballast-water management in the waters of the United States.[162] These guidelines apply to all vessels with ballast water tanks.[163] NISA also establishes a task force charged with developing and implementing "a program for waters of the United States to prevent introduction and dispersal of aquatic nuisance species; to monitor, control and study such species; and to disseminate related information."[164] The Task Force will

> establish and implement measures . . . to minimize the risk of introduction of aquatic nuisance species to waters of the United States, including (A) [identifying] pathways by which aquatic organisms are introduced . . . ; (B) [assessing] the risk that an aquatic organism carried by an identified pathway may become an aquatic nuisance species; and (C) [evaluating] whether measures to prevent introductions of aquatic nuisance species are effective and environmentally sound.[165]

NISA originally had a series of appropriations for invasive species management programs, but these expired in 2002.[166]

2. Effectiveness of NISA

In theory, NISA authorizes the Coast Guard to enforce regulations against vessel operators who have not complied with ballast water disposal regulations and contributed to the spread of aquatic invasive species. However, in practice the effectiveness of NISA is limited. While NISA's statutory language is descriptive and proscriptive, case law

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159. 16 U.S.C. § 4701.
160. *Id.* § 4702(1).
161. *See id.* §§ 4711-4712, 4721-4726.
162. *Id.* § 4711.
163. *Id.* § 4711(b)(2)(A).
164. *Id.* § 4722(a).
165. *Id.* § 4722(c)(1).
166. *Id.* § 4741(b).

suggests that NISA's use is limited.[167] NISA is voluntary, and allows discretion to the appropriate agencies. The United States District Court for the District of Minnesota explained: "The plain language of these NISA sections imposes no limitation on the Coast Guard's discretion to enforce its ballast water regulations. Nor does this language provide meaningful substantive standards."[168] If the Coast Guard decides not to enforce its own ballast regulations, there is no remedy. Moreover, the Coast Guard's mandatory regulations, promulgated through NISA, contain loopholes.[169] Finally, while NISA aims to reduce the spread of aquatic nuisance species through ballast discharges, the law has no impact on terrestrial or avian invasive species.

D. Federal Acts Specific to a Single Invasive Species

Some federal laws authorize plans for the prevention, eradication, and control of a specific species, such as the Brown Tree Snake Control and Eradication Act of 2004.[170] Other laws are tools for federal funding or for Lacey Act injurious species listing. This Part will show that these laws vary in content and would not stand in the way of a comprehensive invasive species statute.

1. Brown Tree Snake Control and Eradication Act of 2004

The Brown Tree Snake Control and Eradication Act of 2004 authorizes funding "to support brown tree snake control, interdiction, research, and eradication efforts carried out by the Department of the Interior and the Department of Agriculture, other Federal agencies, States, territorial governments, local governments, and private sector entities."[171] The Secretary of Interior and Secretary of Agriculture must include "at a minimum the . . . [e]xpansion of science-based eradication and control programs in Guam[,] . . . interagency and intergovernmental

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167. Fednav Ltd. v. Chester, 547 F.3d 607, 612 (6th Cir. 2008); Save Lake Superior Ass'n v. Napolitano, No. 08-CV-1173(JMR/RLE), 2009 U.S. Dist. LEXIS 19739 (D. Minn. Mar. 12, 2009).

168. *Napolitano*, 2009 U.S. Dist. LEXIS 19739, at *11.

169. *See Chester*, 547 F.3d at 612 (holding that the Coast Guard's ballast water requirements, including the 1993 Great Lakes regulations and the 2004 national regulations, did not apply to vessels who declare they have "no ballast on board" (NOBOBs) despite the Coast Guard's admission that "*NOBOBs have the potential to carry [ANS] in their empty tanks via residual ballast water and/or accumulated sediment*" (alteration in original) (quoting Ballast Water Management for Vessels Entering the Great Lakes That Declare No Ballast Onboard, 70 Fed. Reg. 51,831, 51,832 (Aug. 31, 2005)).

170. Brown Tree Snake Control and Eradication Act of 2004, 7 U.S.C. § 8503 (2006).

171. *Id.* § 8503(a).

rapid response teams[,] . . . efforts to protect and restore native wildlife in Guam or elsewhere in the United States damaged by the brown tree snake," and a variety of sustained research and funding programs.[172] Unlike other statutes that authorize appropriations in cost-share schemes, this statute authorizes specific monetary caps on programs for specific time periods.[173] The statute also establishes quarantine protocols to control the spread of the brown tree snake.[174]

It is unknown how effective this statute has been. The Animal and Plant Health Inspection Service (APHIS) reports that Wildlife Services uses snake trapping and nighttime spotlight searches to reduce the number of snakes in areas where cargo is packed or stored, as well as specially trained Jack Russell terriers to detect any brown tree snakes hidden in outgoing cargo.[175] Regardless, there are still reports of brown tree snakes inflicting harm on Guam's environment.[176]

2. Other Specific Species Statutes with Limited Tools

Other specific species laws provide incentives. Some laws provide assistance to specific states and geographic regions implementing programs. For example, the Nutria Eradication and Control Act authorizes the Secretary of the Interior to provide financial assistance to Maryland and Louisiana for programs to eradicate or control nutria and restore marshland damaged by nutria.[177] The statute places the Federal cost share limit at seventy-five percent.[178] Other statutes are merely tools to include a certain species in the list of injurious species on the Lacey Act.[179]

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172. *Id.* § 8503(b).

173. *Id.* § 8503(c)(1) ("For activities conducted through the Animal and Plant Health Inspection Service [APHIS], Wildlife Services, Operations, not more than $2,600,000 for each of the fiscal years 2006 through 2010.").

174. *Id.* § 8504(a).

175. APHIS, U.S. DEP'T OF AGRIC., NO ESCAPE FROM GUAM: STOPPING THE SPREAD OF THE BROWN TREE SNAKE 6 (1998), http://www.aphis.usda.gov/publications/wildlife_damage/content/printable_version/btsbro.pdf.

176. *Brown Tree Snake Could Mean Guam Will Lose More Than Its Birds*, SCI. DAILY (Aug. 10, 2008), http://www.sciencedaily.com/releases/2008/08/080808090313.htm.

177. Nutria Eradication and Control Act of 2003, Pub. L. No. 108-16, 117 Stat. 621 (2003).

178. *Id.* § 3(d)(1)

179. Asian Carp Prevention and Control Act, Pub. L. No. 111-307, 124 Stat. 3282 (2010) (amending the Lacey Act, "inserting 'of the bighead carp of the species Hypophthalmichthys nobilis;' after 'Dreissena polymorpha'").

3. Assessment of Single Species Act Effectiveness

Species specific statutes have benefits for prevention and restoration. Since these laws address a particular species and geographic region, they are individually tailored and aim to fix a concrete problem. Furthermore, the Nutria Eradication and Control Act and Brown Tree Snake Control and Eradication Act have specific funding sources written into the statute, making the monetary support for these programs more likely.

However, specific species statutes share many of the same challenges as the Lacey Act. First, they are reactive instead of preventative. By the time the statute is passed, the problem might have grown to such a proportion that the solution in the statute is insufficient, or alternatively, the problem has already solved itself. Both houses of Congress have to review and pass the statutes, and then the President has to have an opportunity to review and sign or veto them. The House of Representatives voted on the Captive Primate Safety Act in 2009,[180] but the bill died at the end of the legislative session due to inaction.

Furthermore, if there are hundreds of potentially invasive nonnative species that could cause destruction throughout the United States, why expend resources trying to solve the problem one by one? It does not make sense to pass separate laws for different subspecies at different times, as evidenced by the Asian Carp Act.[181] The slow and protracted nature of the legislative process is ineffective to deal with the rapid spread of invasive species. It is impractical to hope that legislators will draft and submit bills for each and every species that poses a threat to the environment.

E. Nonnative Wildlife Invasion Prevention Act

The proposed Nonnative Wildlife Invasion Prevention Act (NWIPA) died at the end of the 2009-2010 legislative session.[182] However, a review will benefit our analysis. NWIPA would have established a broad prevention framework for nonnative species, prohibiting the possession, barter, or release into the wild of any nonnative wildlife species prohibited under the new risk assessment system.[183] It also would have created a clean list to be published in the Federal Register excluding any animal listed currently in the Lacey Act as an injurious species, or "any

180. Captive Primate Safety Act, H.R. 80, 111th Cong. (1st Sess. 2009).
181. *See* Asian Carp Prevention and Control Act, Pub. L. No. 111-307, 124 Stat. 3282.
182. Nonnative Wildlife Invasion Prevention Act, H.R. 669, 111th Cong. (1st Sess. 2009).
183. *Id.* § 6.

species, the importation of which is prohibited by any other Federal law or regulation of the United States due to the likelihood of causing harm to the economy, the environment, or other animal species or human health."[184] A detailed risk assessment process would have evaluated the risk of a species becoming invasive based on a number of factors, including the native range of the species, if the species has caused harm to the economy, the environment, or human health in ecosystems that are similar to those in the United States, the likelihood of establishment and spread of the species in the United States, and the likelihood that the species would harm wildlife, habitats, or ecosystems.[185] A provision would have grandfathered in the possession of individual animals if they were owned before the statute was passed.[186]

F. Summary of Current Legal and Regulatory Invasive Species Landscape

In sum, current federal invasive species laws have limited use, and do not satisfy the framework for a comprehensive invasive species plan. While there are tools for prevention, such as the injurious species listing and prohibitions of all other state and foreign laws regulating the importation of species, they are not comprehensive. There are no detailed statutory provisions for surveillance, quarantines, or special permits for invasive species.[187] Additionally, since the listing process is a dirty list instead of a clean list, the Lacey Act is a reactive tool instead of a preventative tool. While the Executive Order fosters collaboration between different agencies, there is no force behind the law to compel results. NISA is limited to aquatic nuisance species and does not have enforcement power or adequate funding. Species specific statutes are also reactive instead of preventative. Some species specific laws have funding and grant programs, an idea that could be utilized on a national scale. H.R. 669 would have been an improvement for invasive species prevention but was never passed.[188]

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184. *Id.* § 4(a)(2)(B).

185. *Id.* § 3(b).

186. *Id.* § 3(f).

187. The Center for Disease Control has several specific regulations for animals that may carry disease, such as civets, bats, and birds, but there is not a specific law addressing surveillance and quarantine of invasive species. *See* Control of Communicable Diseases; Restrictions on African Rodents, Prairie Dogs, and Certain Other Animals, 68 Fed. Reg. 62,353 (Nov. 4, 2003).

188. Nonnative Wildlife Invasion Prevention Act, H.R. 669.

IV. PATCHWORK OF OTHER LAWS AVAILABLE FOR INVASIVE SPECIES REGULATION: DO THEY FULFILL THE RUBRIC?

Alone, the laws described in the previous Part are ineffective for invasive species regulation. However, a variety of other mechanisms not explicitly designed for regulating nonnative species could be applied either directly or as a model. This Part will explore the utility of other federal statutes, including NEPA, the Endangered Species Act (ESA), the Clean Water Act (CWA), and the Animal Health Protection Act (AHPA). The common law cause of action of public nuisance, free market solutions, and exotic pet restrictions will also be discussed. These tools offer a spectrum of solutions, from prevention to penalty to liability and cost recovery for damages, and their utility will be evaluated. The analysis will reveal that these remedies are insufficient to fully deal with invasive species and that a comprehensive statute is needed.

A. National Environmental Policy Act

NEPA can operate as a prevention tool through a mechanism that assesses risks for federal actions that may impact the spread of invasive species.[189] NEPA mandates federal agencies to consider and consult with the public about the environmental effects of their actions.[190] NEPA applies to all major federal actions, including projects and programs entirely or partly funded, assisted, conducted, regulated, or approved by federal agencies.[191] Where any major federal action significantly affects the quality of the human environment, the agency is required to fill out an Environmental Impact Statement (EIS), providing a description of the proposed action, and the existing environment, as well as analysis of the anticipated beneficial and adverse environmental effects of all reasonable alternatives.[192] For federal projects where it is not initially clear whether there will be significant impacts, an environmental assessment (EA) must first be prepared to analyze the environmental impacts of a proposed federal action and provide sufficient evidence to determine the level of significance of the impacts.[193] If significance of an impact is not found, a "finding of no significant impact" (FONSI) is issued.[194]

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189. *See* National Environmental Policy Act, 42 U.S.C. §§ 4321-4370f (2006).
190. *Id.* § 4332.
191. *Id.*
192. *Id.*
193. 40 C.F.R. § 1508.9 (2011).
194. 40 C.F.R. § 1501.4(e).

1. Risk Assessment and Prevention Through Environmental Impact Statements

Searching the EPA's Web site for EISs submitted after 2003 containing the term "invasive species" reveals only thirty-one documents.[195] Most of these focus on invasive vegetation, but some on invasive aquatic animal species.[196] Sometimes, an EIS assesses possible impacts a federal project has on the spread of invasive animal species and describes possible mitigation measures. For example, the Guam Military Relocation EIS addressed the impacts of a relocation of a military base on the spread of the brown tree snake and the coconut rhinoceros beetle in Guam, and proposed biosecurity measures by the Department of Defense for mitigation.[197]

However, because an EIS must look at the other potential impacts that the project poses on the human environment, an EIS can delay federal actions that aim to stop the spread of invasive species. For example, currently, the United States Army Corps of Engineers (USACE), in consultation with other federal agencies, Native American tribes, state agencies, local governments, and nongovernmental organizations, is conducting the Great Lakes and Mississippi River Interbasin Study (GLMRIS) to explore options and technologies that could be applied to prevent ANS transfer between the Great Lakes and Mississippi River basins through aquatic pathways.[198] At the time of this writing, the USACE is seeking input from the public through the NEPA scoping process.[199] Due to the nature of the NEPA scoping process, the GLMRIS may be delayed, possibly by a year. In the meantime, the ANS in the Great Lakes may increase in population and become a more severe

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195. *National Environmental Policy Act: Search Environmental Impact Statements (EISs) Since January, 2004*, EPA, http://yosemite.epa.gov/oeca/webeis.nsf/AdvSearch?OpenForm (last updated Oct. 27, 2011) (search the term "invasive species," with quotation marks around the term, and follow the "Submit Search" button).

196. *See* FOREST SERV., U.S. DEP'T OF AGRIC., FINAL ENVIRONMENTAL IMPACT STATEMENT: FREDS FIRE REFORESTATION (Feb. 2010), http://www.fs.fed.us/r5/eldorado/documents/freds/freds_feis_no%20maps.pdf; JOINT GUAM PROGRAM OFFICE, U.S. DEP'T OF THE NAVY, FINAL ENVIRONMENTAL IMPACT STATEMENT, GUAM AND CNMI MILITARY RELOCATION (July 2010), http://www.guambuildupeis.us/documents/final/volume_7/Volume_7_Proposed_Mitigation_Measures_Preferred_Alternatives_Impacts_and_Cumulative_Impacts.pdf; PIMA COUNTY, ARIZONA, BD. OF SUPERVISORS, INVASIVE SPECIES E.I.S. ISSUE PAPER: SONORAN DESERT CONSERVATION PLAN (2002), http://www.pima.gov/cmo/sdcp/reports%5Cd27%5C03INVSPE.PDF.

197. JOINT GUAM PROGRAM OFFICE, *supra* note 196, at 1-9 to -10.

198. Notice of Intent To Prepare a Draft Environmental Impact Statement (EIS), Initiate the Public Scoping Period and Host Public Scoping Meetings for the Great Lakes and Mississippi River Interbasin Study ("GLMRIS"), 75 Fed. Reg. 69,983 (Nov. 16, 2010).

199. *Id.*

problem. Therefore, NEPA may delay necessary projects that would target invasive species.

2. Litigation Through NEPA with Inconsistent Results

Disputes involving the analysis of invasive species through NEPA processes have spawned a variety of litigation. Occasionally, litigation successfully prevents projects that would have spread invasive species. In some cases, the litigation prompts a deeper evaluation of a problem, mandating an agency to perform an EIS where previously only an EA was completed and a FONSI was issued. For example, in *Province of Manitoba v. Norton*, the government of Manitoba sued the Department of Interior for failing to comply with NEPA in approving the Northwest Area Water Supply Project (NAWS), to transfer water from the Missouri River Basin into the Hudson Bay Basin.[200] Manitoba argued that the EA was inadequate and the FONSI was arbitrary and capricious because it did not fully evaluate how the project threatened to bring nonnative biota from the Missouri River Basin into the Hudson Bay Basin.[201] Manitoba contended that NAWS threatened to irreparably harm the Hudson Bay Basin by introducing an alien and invasive species that would pose serious threats to the aquatic resources which are owned and managed by the Province.[202] The Court agreed with Manitoba, and demanded that the EA analyze the possibility of leakage and the potential consequences of the failure to fully treat the Missouri River water at its source.[203] This new EA prompted an EIS in 2008. As a result, three new alternatives were suggested to further reduce the risk of transferring invasive species in the project.[204] This was a successful result because it forced the agency to more aggressively consider a project's impacts on the spread of invasive species and consider less severe alternatives.

However, in other cases, a challenge to an agency's NEPA analysis did not result in the agency taking more of a "hard look" at invasive species impacts.[205] In *National Parks & Conservation Ass'n (NPCA) v.*

200. 398 F. Supp. 2d 41, 44 (D.D.C. 2005).

201. *Id.*

202. *Id.* at 51 n.9.

203. *Id.* at 65-66.

204. BUREAU OF RECLAMATION, RECLAMATION: MANAGING WATER IN THE WEST: NORTHWEST AREA WATER SUPPLY PROJECT FINAL ENVIRONMENTAL IMPACT STATEMENT ON WATER TREATMENT 2-1 to -2 (Dec. 2008), http://www.usbr.gov/gp/dkao/naws/FEIS/Reports/NAWS%20FEIS.pdf.

205. *See* Sierra Club Northstar Chapter v. Kimbell, 640 F. Supp. 2d 1082 (D. Minn. 2008) (holding that the Final EIS did take a requisite look at the issue, while Sierra Club contended that the Forest Service failed to analyze cumulative nonnative species impacts to the Boundary Waters); Nat'l Parks & Conservation Ass'n v. U.S. Dep't of Transp., 222 F.3d 677 (9th Cir. 2000);

U.S. Department of Transportation, the NPCA contended that the Federal Aviation Administration (FAA) violated NEPA by failing to analyze the impact of an airport runway extension on the introduction of alien nonindigenous species into Maui.[206] The Final EIS concluded that "the impact of the Proposed Project on [the] alien species introduction rate is, in and by itself, insignificant."[207] The NPCA argued that the runway extension would lead to more flights arriving at Kahului which would result in more introductions of dangerous alien species into Maui.[208] The court was not convinced by the NPCA's arguments, and held that since the EIS contained the "requisite hard look at the alien species problem, it satisfie[d] NEPA."[209] The court stated, "If we determine that the agency took a 'hard look' at a project's environmental consequences, our review is at an end."[210] Scholars have called this ruling into question, arguing that the cumulative impacts were not adequately considered.[211] Comparing these two examples shows that litigation has varying results and creates precedents that courts do not always follow. NEPA analysis is highly fact-sensitive.

3. Utility of NEPA for Invasive Species Prevention

NEPA thus provides a helpful prevention mechanism for assessing the potential impacts of a federal project on the spread of invasive species. However, the scope remains limited to federal projects, and would not prevent the spread of invasive species through private actors engaged in the exotic pet trade or wildlife smuggling. While NEPA imposes extra duties, there are no penalties.[212] Moreover, in some cases a NEPA analysis may delay an important project that is aimed at solving an aspect of the invasive species problem. While useful under certain

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Stop the Pipeline v. White, 233 F. Supp. 2d 957 (S.D. Ohio 2002) (holding that the Forest Service and the Corps' review of pipeline projects fragmentation of habitat impact on birds from effects of invasive species was considered adequately in EIS); S.F. Baykeeper v. U.S. Army Corps of Eng'rs, 219 F. Supp. 2d 1001 (N.D. Cal. 2002) (holding that the Corps was not required to describe the potentially severe consequences of invasive species introduction into the bay because there was no credible scientific evidence that such impacts would occur).

206. 222 F.3d at 678-79.

207. *Id.* at 679 (alteration in original).

208. *Id.*

209. *Id.* at 682.

210. *Id.* at 680 (citing Idaho Conservation League v. Mumma, 956 F.2d 1508, 1519 (9th Cir. 1992)).

211. Stephanie J. Gliege, Note, *NEPA and the Danger of Alien Species Introduction: Taking a Hard Look at* National Parks & Conservation Ass'n v. United States Department of Transportation, 41 JURIMETRICS J. 31, 44 (2001).

212. *See* National Environmental Policy Act, 42 U.S.C. §§ 4321-4370f (2006).

circumstances, NEPA satisfies only a small piece of the invasive species regulation rubric.

B. Endangered Species Act for Prevention and Enforcement

The purpose of the ESA is to conserve the ecosystems upon which endangered species and threatened species depend and provide conservation programs for these species.[213] A species is listed as endangered or threatened based on an assessment of a variety of factors, including the present or threatened destruction of its habitat and other natural or manmade factors affecting its continued existence.[214] Where an invasive species may harm a protected species, section 7[215] provides limited preventative relief and section 9[216] provides punishment.

1. Prevention Through Section 7

Section 7 may serve as a preventative mechanism for federal projects that could cause the spread of invasive species and cause harm to listed species. Under section 7, federal agencies are precluded from taking actions "likely to jeopardize the continued existence" of listed species, or resulting in "the destruction or adverse modification" of their critical habitat.[217] Action is defined broadly to include funding, permitting, and other regulatory actions.[218] Before proceeding with a proposed action, the agency must determine whether any listed species may be present in the area, and if so, whether the species is likely to be affected by the action.[219] A biological assessment is then conducted. If the biological assessment reveals a likely adverse effect, the proposing agency must formally consult with the Service for impacts to listed land or freshwater species or the National Marine Fisheries Service (NMFS) for marine listed species, and issue a biological opinion (BO).[220] If the BO concludes that the proposed action would jeopardize the listed species or adversely affect its critical habitat, the action may not proceed unless the Service suggests alternatives to avoid the problem.[221]

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213. Endangered Species Act, 16 U.S.C. § 1531(b) (2006).
214. *Id.* § 1533(a)(1).
215. *Id.* § 1536.
216. *Id.* § 1538.
217. *Id.* § 1536(a)(2).
218. 50 C.F.R. § 402.02 (2011). For local governments, any project that requires a federal permit or receives federal funding is subject to section 7. *Id.*
219. 16 U.S.C. § 1536(a)(2).
220. 50 C.F.R. § 402.12.
221. 16 U.S.C. § 1536(g)(3).

a. Litigation Based on Invasive Species Through Section 7

While there has not been widespread litigation involving invasive species impacts on listed species through section 7, there was a challenge to a BO involving the analysis of impacts on two species of endangered birds from the spread of invasive species from ballast water.[222] The case involved the environmental impact of two construction projects jointly funded by the Port of Oakland and the United States Army Corps of Engineers (USACE) to deepen the channels and berths and create new channels.[223] The USACE conducted a consultation with the Service for impacts on the California least tern and brown pelican, and a consultation with the NMFS for impacts on the Chinook salmon.[224] The BO stated that ballast water discharges were a major path for introducing nonnative species into the Bay-Delta ecosystem. However, since ballast water discharges to the San Francisco Bay would decrease with anticipated changes in shipping practices, the projects were not likely to jeopardize listed species or their habitat.[225]

The plaintiff San Francisco Baykeeper argued "that the agencies improperly limited the scope of their [BOs] to the immediate vicinity of the proposed projects."[226] The plaintiffs further argued:

> Because invasive species can reproduce and spread to the limit of their ecological tolerances, . . . the proposed actions could indirectly affect listed species found throughout the Bay-Delta ecosystem. Thus, [the agencies] should have evaluated the indirect effects of the projects on each listed species found in the San Francisco Bay estuary.[227]

The court disagreed, stating that the

> [p]laintiffs' proposed methodology would require the agencies to assess the indirect effects that changed shipping patterns at the Port of Oakland would have on all listed species in the Bay-Delta ecosystem, or potentially, the west coast of the United States. Such an analysis would require a degree of speculation not contemplated by [section] 7 of the ESA, which focuses on actions that are "likely to jeopardize" the continued existence of listed species.[228]

Thus, this case's precedent limits potential impacts of a nonnative species on an ecosystem to a specific area.

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222. S.F. Baykeeper v. U.S. Army Corps of Eng'rs, 219 F. Supp. 2d 1001 (N.D. Cal. 2002).
223. *Id.* at 1006.
224. *Id.* at 1009-10.
225. *Id.* at 1010.
226. *Id.* at 1021.
227. *Id.*
228. *Id.* at 1021-22 (quoting 16 U.S.C. § 1536(a)(2)) (citing 40 C.F.R. § 402.14(h)(3)).

b. Overall Scope of ESA Section 7 for Invasive Species Regulation

A section 7 consultation is only triggered if an action causes or may cause an invasive species to harm a listed species.[229] This means that, if there was a federal action on the Mississippi River that could potentially introduce nonnative species, but its impact could not be closely tied to effects on a listed species, the ESA would not be triggered. Specific scientific evidence will be needed to show that indirect impacts are not speculative. In the future, litigators may find it difficult to rely on this statute in situations where it is unknown how far a nonnative species may spread.

2. Enforcement and Punishment Through Section 9

Section 9 of the ESA can be used as punishment for actions that spread invasive species where it results in a "taking" of a listed species.[230] It is unlawful for a person to import an endangered species into, or export any such species from the United States, take any such species within the United States, the territorial seas of the United States, or on the high seas, or possess, sell, deliver, carry, transport, or ship, by any means whatsoever.[231] The "take" definition is "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."[232] A mere risk of injury is not a taking.[233] A habitat modification may amount to a taking.[234] The penalties for a section 9 violation range from civil penalties, including fines for knowing violations of not more than $25,000 for each violation, to criminal violations of not more than $50,000 or imprisonment for up to one year, or both.[235] For this to apply to invasive species, a person would have to release an invasive species, and then that specific invasive species would have to be documented taking a listed species. Amy McMaster wrote that section 9 could be a helpful tool to protect listed species against the

229. *See* Endangered Species Act, 16 U.S.C. § 1536(a) (2006).
230. *Id.* § 1538(a)(1).
231. *Id.*
232. *Id.* § 1532(19).
233. Am. Bald Eagle v. Bhatti, 9 F.3d 163, 165 (1st Cir. 1993).
234. Babbitt v. Sweet Home Chapter of Communities for a Great Or., 515 U.S. 687, 708 (1995).
235. 16 U.S.C. § 1540(a)-(b).

impacts of invasive species, although recent case law indicates otherwise.[236]

In a recent case, the Coalition for a Sustainable Delta (Coalition) argued that enforcing regulations to protect and increase the nonnative striped bass population would result in the taking of a listed species native to the Sacramento-San Joaqin Delta, including the Delta Smelt.[237] The Coalition argued that the regulation caused an individual angler to release, or not catch one particular striped bass, which then would consume one particular individual listed species.[238] The court ruled against this argument, stating that there had been no facts to support this finding and that it is entirely hypothetical.[239] The plaintiff's second argument was that the regulations had population-level effects on the listed species, as striped bass may eat delta smelt.[240] The court did not agree, and noted that the striped bass may also eat delta smelt predators and competitors.[241] While the plaintiffs were not successful here, it is possible that with more specific evidence, such as a photo of a Burmese python harming a listed species, this cause of action could be successful in future cases.

3. Utility of ESA for Invasive Species Control

In sum, the ESA's section 7 and section 9 could have some utility in protecting listed species and their critical habitats from invasive species.[242] The scant case law suggests that compelling scientific evidence is needed to demonstrate the link between the spread of an invasive species in one area, and its impact on a listed species. The applicability is limited to impacts on listed species. For example, even if an Asian carp wreaked havoc on the fishing industry in the Great Lakes, if impacts could not be shown to harm a specific listed species, then the ESA would not be useful.

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236. Amy J. McMaster, *When Aliens Invade: Regulating the Release of Exotic Species Through the "Takings Clause" of the Endangered Species Act*, [Aug. 2003] 33 Envtl. L. Rep. (Envtl. Law Inst.) 10,583, 10,589, *available at* www.elr.info/articles/vol33/33.10583.pdf.

237. Coal. for a Sustainable Delta v. Koch, No. 1:08-CV-00397 OWW GSA, 2009 WL 2151842, at *1 (E.D. Cal. July 16, 2009).

238. *Id.* at *7.

239. *Id.*

240. *Id.*

241. *Id.*

242. *See FWS Invasive Programs*, U.S. FISH & WILDLIFE SERV., http://www.fws.gov/invasives/programs.html (last updated Jan. 13, 2009).

C. Clean Water Act for Prevention and Possible Enforcement

The objective of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[243] The CWA can be used as a preventative mechanism to regulate the flow of invasive species into the waters of the United States and potentially as an enforcement mechanism to punish those who release invasive species into waters of the United States. The CWA mandates that "the discharge of any pollutant by any person shall be unlawful."[244] The CWA establishes the National Pollution Discharge Elimination System (NPDES) permit system to regulate discharges of pollutants into waters of the United States.[245] A point source can obtain a permit for "the discharge of any pollutant, or combination of pollutants."[246] A pollutant is defined as "dredged spoil, . . . *biological materials*, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste *discharged into water*."[247] "The term 'biological materials' includes invasive species."[248] A "point source" is "any discernible, confined and discrete conveyance, including [a] vessel or other floating craft, from which pollutants are or may be discharged."[249] Thus, invasive species, if emitted into navigable waters of the United States from a point source must have a permit. For example, the EPA's NPDES vessels program regulates incidental discharges from the normal operation of vessels such as ballast water, to prevent the spread of aquatic invasive species.[250] While this may seem limited in scope, it is one of the few ways to prevent both private persons and government actors from spreading invasive species in water.

1. Application of CWA State Water Quality Framework to Invasive Species

The CWA creates a regulatory framework for states for water quality regulations. Section 303(d) of the CWA requires states, territories, and authorized tribes to set water quality standards and develop lists of impaired waters, which are waters that are too polluted or

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243. Clean Water Act, 33 U.S.C. § 1251(a) (2006).
244. *Id.* § 1311(a).
245. *Id.* § 1342.
246. *Id.* § 1342(a)(1).
247. *Id.* § 1362(6) (emphasis added).
248. Nw. Envtl. Advocates v. U.S. EPA, 537 F.3d 1006, 1021 (9th Cir. 2008) (citing Nat'l Wildlife Fed'n v. Consumers Power Co., 862 F.2d 580, 583 (6th Cir. 1988)).
249. 33 U.S.C. § 1362(14).
250. *National Pollutant Discharge Elimination System (NPDES): Vessel Discharges*, EPA, http://cfpub.epa.gov/npdes/home.cfm?program_id=350 (last updated Jan. 4, 2011).

otherwise degraded to meet the water quality standards.[251] The states then develop Total Maximum Daily Loads (TMDL) for these waters, which calculate "the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards."[252] Because an invasive species falls under the definition of a "pollutant," TMDLs can be developed to limit their release into water bodies.

Several states regulate the entrance of invasive species into their waters through CWA mechanisms. For example, Iowa's Pierce Creek Pond was listed in 2004 as impaired by invasive species.[253] In 2005, a TMDL was written for its nonalgal turbidity impairment.[254] The TMDL attributes the nonalgal turbidity to the presence of nonnative carp, and advises that, as a management technique, the carp should be removed from the lake.[255] An invasive species TMDL was drafted for the San Francisco Bay Estuary in 2000, but it has yet to be submitted to California's State Water Resources Control Board for approval.[256] The draft TMDL explained that due to significant risks, there should be no exotic species introductions, and the TMDL would be zero.[257]

However, because the TMDL program is in the power of the individual states to develop, there is a lack of uniformity. Most states have not developed TMDLs for invasive species, even in places where they would be needed most. For example, even though Florida has the third largest number of reported aquatic alien species of any state, the Florida Department of Environmental Protection has neither developed a TMDL for invasive species, nor directly addresses the problem in TMDLs for other causes of impairment, such as nutrients.[258] Invasive

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251. 33 U.S.C. § 1313(d); *see also Impaired Waters and Total Maximum Daily Loads*, EPA, http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/index.cfm (last updated Sept. 29, 2011).

252. *Impaired Waters and Total Maximum Daily Loads*, *supra* note 251.

253. IOWA DEP'T OF NATURAL RES., TOTAL MAXIMUM DAILY LOAD FOR NON-ALGAL TURBIDITY, PIERCE CREEK LAKE, PAGE COUNTY, IOWA 14 (2005), http://www.epa.gov/waters/tmdldocs/11278_PierceCreekLakeTMDL%20Final.pdf.

254. *Id.*

255. *Id.*

256. ENVTL. LAW INST., THE ROLE OF AQUATIC INVASIVE SPECIES IN STATE LISTING OF IMPAIRED WATERS AND THE TMDL PROGRAM: SEVEN CASE STUDIES 17 (May 2008).

257. CAL. REG'L WATER QUALITY CONTROL BD., PREVENTION OF EXOTIC SPECIES INTRODUCTIONS TO THE SAN FRANCISCO BAY ESTUARY: A TOTAL MAXIMUM DAILY LOAD REPORT TO U.S. EPA 87 (May 8, 2000), http://www.swrcb.ca.gov/sanfranciscobay/publications_forms/documents/Tmdl.pdf; *see* ENVTL. LAW INST., *supra* note 256, at 8-9; *Final 2008 California 303(d)/305(b) Integrated Report: Chowchilla River*, ST. WATER RESOURCES CONTROL BD., http://www.waterboards.ca.gov/rwqcb5/water_issues/tmdl/impaired_waters_list/final_2008_303d/01267.shtml (last visited Sept. 30, 2011) (refusing to list invasive species in the Chowchilla River on the 303(d) TMDL list because of a lack of evidence).

258. ENVTL. LAW INST., *supra* note 256, at 21.

species cross boundary lines, by definition, so a state's TMDL would not necessarily prevent the entrance of an invasive species from a bordering state that did not have a TMDL. If states establish more invasive species TMDLs in the future, they will have to coordinate their efforts to have an effect across borders. This dilemma emphasizes the point that, for the invasive species to be controlled, it must be addressed at the federal level to solve intrastate problems.

2. Punitive Mechanisms

There are punishment mechanisms through the CWA. The EPA may assess civil penalties, after providing the persons subject to the penalty notice of the proposed penalty and an opportunity for a hearing.[259] Any person who, without authorization, discharges a pollutant to a navigable water may be administratively assessed a civil penalty of up to $125,000.[260] There are also criminal penalties, ranging from fines of $2,500 to $25,000 per day per violation, or imprisonment up to one year for negligent violations, to $250,000 or imprisonment up to fifteen years, or both for violations where the defendant knows at that time that he places another person in imminent danger of death or serious bodily injury.[261] Notice that penalties are fixed fines and prison sentences and are not based on the actual cost of cleaning up the problem. While fines and prison sentences are helpful for punishment and act as a deterrent, they are not aimed at payment for the damage caused by the invasive species. While the author cannot find examples of fines assessed for the spread of invasive species through the CWA, it is a plausible mechanism.

3. Assessment of the CWA's Scope

For practical purposes, the CWA's protections provide a limited scope. First, it only provides protection for "waters of the United States."[262] For example, the release of a Burmese python into a wetland in Florida could potentially not be covered. In light of the Supreme Court case *Rapanos* and its resulting case law, gaining CWA jurisdiction for wetlands protection has become more difficult than ever before.[263]

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259. Clean Water Act, 33 U.S.C. § 1319(g) (2006).
260. *Id.* § 1319(g)(2)(B).
261. *Id.* § 1319(c)(1)-(3).
262. *Id.* § 1362(7).
263. *See* Rapanos v. United States, 547 U.S. 715 (2006). Following *Rapanos*, courts have used either Justice Kennedy's concurring opinion using a "significant nexus" to traditionally navigable waters, in that they "significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable.'" *Id.* at 780 (Kennedy, J.,

Furthermore, the CWA requires that the release come from a point source.[264] That point source from which the invasive species was released into the wild must be identifiable.[265] If the source is a mystery, such as an unidentified ship releasing zebra mussels, the CWA will not apply. To add an extra layer of complexity, the United States Courts of Appeals for the Second and Ninth Circuits have held that humans cannot be point sources.[266] Accordingly, a person releasing a pet python into a canal probably would not qualify as a point source, at least in the Second and Ninth Circuits.[267] Thus, under limited circumstances, the CWA may be used as a tool to prevent the spread of invasive species. Nevertheless, states can develop TMDLs to regulate and prevent invasive species throughout state impaired water bodies.

D. Animal Health Protection Act (AHPA) for Prevention and Cost Recovery

The AHPA is a prevention and cost recovery statute limited in scope to impacts on livestock.[268] Pursuant to the APHA, the Animal and Plant Health Inspection Service (APHIS) may prohibit imports of particular

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concurring). Justice Scalia's plurality opinion for wetlands jurisdiction held that "those relatively permanent, standing or continuously flowing bodies of water" and "*only* those wetlands with a continuous surface connection to" other regulated waters are covered under the CWA. *Id.* at 739, 742 (plurality opinion); *see also* Precon Dev. Corp. v. U.S. Army Corps of Eng'rs, 633 F.3d 278 (4th Cir. 2011) (holding there to be no wetlands jurisdiction where the record did not contain enough physical evidence, either quantitative or qualitative, to show measurements of actual flow).

264. 33 U.S.C. § 1311.

265. *See id.*

266. *See* United States v. Plaza Health Labs., Inc., 3 F.3d 643 (2d Cir. 1993) (finding that a person releasing vials of hepatitis-B-tainted blood into the Hudson River was not liable under the CWA because a human cannot be a point source); Or. Natural Desert Ass'n v. Dombeck, 172 F.3d 1092, 1099 (9th Cir. 1998) ("It would be strange indeed to classify as a point source something as inherently mobile as a cow. We agree with the Second Circuit that the term 'point source' does not include a human being, or any other animal.") (citing *Plaza Health Labs., Inc.*, 3 F.3d at 649).

267. The United States Supreme Court has not addressed the issue so it may not be outside the realm of possibility that another circuit would include a human as a point source. *Cf.* Long Island Soundkeeper Fund, Inc. v. N. Y. Athletic Club, No. 94 Civ. 0436 (RPP), 1996 WL 131863, at *13 (S.D.N.Y. Mar. 22, 1996) ("Other courts have recognized that a wide range of polluting activities are point sources within the meaning of the Act where human activity generates pollution and pollutants are conveyed into water by human effort." (citations omitted)). For instance, a group of pet owners who customarily released pet pythons on a certain platform by a canal may be held liable under the CWA if it was found that the platform itself was the point source. *See id.* But see *Cordiano v. Metacon Gun Club, Inc.*, 575 F.3d 199, 223 (2d Cir. 2009), which held that a berm next to a firing range was not a point source because of the lack of evidence showing pollution coming from a discrete conveyance. However, the court stated that their "holding [was] not that a berm can never constitute a point source, but only that there [was] insufficient evidence [in this case.]" *Id.* at 224.

268. Animal Health Protection Act, 7 U.S.C. § 8303(a) (2006).

animals or prohibit specific "means of conveyance" to prevent the introduction of "any pest or disease of livestock."[269] This prohibition is narrow by its terms, focused only on pests and diseases of farm animals such as cattle, horses, sheep and swine.[270] The term "pest" is defined as "any of the following that can directly or indirectly injure, cause damage to, or cause disease in livestock:" A protozoan, plant, bacteria, fungus, a virus or viroid, infectious agent or other pathogen, arthropod, parasite, prion, vector, or any similar organism.[271] In practical terms, this means that if an invasive species impacts livestock, it falls under this statute's scope whereas if it impacts other wildlife it is not triggered. A Burmese python that swallows a calf will trigger APHA whereas a Burmese python that swallows an alligator will not.[272]

1. Prevention Through the AHPA

The AHPA prohibits the movement of any animal that has strayed into the United States if "the Secretary [of Agriculture] determines that the prohibition or restriction is necessary to prevent the introduction into or dissemination within the United States of any pest or disease of livestock."[273] Livestock is defined as "all farm-raised animals."[274] The Secretary of Agriculture is not required to "quantify a permissible level of risk or to conduct a risk assessment."[275] On the contrary, courts have emphasized the USDA's "wide discretion in dealing with the importation of plant and animal products," and "the statute's use of the word 'may' suggests that [USDA] is given discretion over such decisions as whether to close the borders."[276] Thus, the USDA has leeway to make decisions that can restrict the spread of invasive species

2. Restoration and Cost Recovery in the AHPA

The AHPA authorizes the Secretary of Agriculture to order the destruction or removal from the United States of any animal if it is

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269. *Id.* § 8303(a)(1).
270. *Id.* § 8302(10).
271. *Id.* § 8302(13).
272. *See* Victoria Gilman, *Photo in the News: Python Bursts After Eating Gator (Update)*, NAT'L GEOGRAPHIC NEWS (Sept. 5, 2006), http://news.nationalgeographic.com/news/2005/10/1006_051006_pythoneatsgator.html.
273. 7 U.S.C. § 8303(a)(2).
274. *Id.* § 8302(10).
275. Cactus Corner, LLC v. U.S. Dep't of Agric., 450 F.3d 428, 433 (9th Cir. 2006) (quoting Ranchers Cattlemen Action Legal Fund United Stockgrowers v. U.S. Dep't of Agric., 415 F.3d 1078, 1097 (9th Cir. 2005)).
276. *Id.* at 433-34 (alteration in original) (quoting *Ranchers Cattleman*, 415 F.3d at 1094).

deemed "necessary to prevent the introduction into or dissemination within the United States of any pest or disease of livestock."[277] Additionally, the animal's owners may be required to disinfect the "means of conveyance used in connection with the importation of an animal."[278] "If an owner fails to comply with an order of the Secretary[,] . . . the Secretary may . . . take remedial action, destroy, or remove from the United States the animal or progeny of any animal [and] recover from the owner the costs of any care, handling, disposal, or other action incurred by the Secretary in connection with the remedial action, destruction, or removal."[279] As of this writing, there is no case law regarding the interpretation of this cost recovery clause. The cost recovery clause in the APHA suggests that the "polluter pays" principle could apply.[280] APHIS could craft a guidance memorandum describing how these costs could be calculated. While each situation has its own circumstances, guidance detailing clean-up methods, recovery, and disposal could make the APHA more streamlined and easier to use.

3. Application as an Invasive Species Law

Due to the limited scope to "pests" that impact livestock, the application of the APHA to invasive species is limited. The APHA may address feral pig problems, such as when they physically dig up earth, upsetting the pasture for livestock, or transmit various infectious diseases to livestock.[281]

E. State Exotic Pet Ownership Restrictions

One of the main sources of invasive species is from the release of exotic pets into the environment. Although no federal law regulates the ownership of exotic pets or the release of them into the environment, or requires owners to microchip these pets, numerous state laws address exotic pets. This Part will explore these state laws and evaluate their effectiveness. A federal uniform ban or permit system for possession, release, and identification of these animals could serve as a strong preventative mechanism.

277. 7 U.S.C. § 8303(c).
278. *Id.* § 8303(c)(2)(A).
279. *Id.* § 8303(c)(2)(B).
280. *Id.*
281. *See id.* § 8303(a).

1. Prevention

States' laws relating to the private possession and release of exotic animals are varied.[282] Some states have explicit bans on the private ownership of listed exotic animals, with limited exceptions. For example, a California statute makes it unlawful to import, transport, or possess live animals restricted in subsection (c) of the statute (including all monkeys and apes, owls, and cheetahs, among other species) except under permit issued by the Department of Fish and Game.[283] Permits only apply to commercial, research, and educational entities and no permits are granted for private pet ownership.[284] No person shall release any wild animal into the wild without written permission from the Fish and Game Commission, including domestically reared stocks of nonnative animals to California, diseased animals, or animals potentially genetically detrimental to agriculture or to native wildlife.[285] Other states require the owner of an exotic animal to obtain a license or permit, or register the animal.[286] Some states ban specific species, such as Florida's ban of Burmese python ownership.[287] A variety of state laws require certain exotic pets, such as large carnivores, to be microchipped for identification.[288]

However, other state restrictions on exotic animal ownership are limited. In Montana, a person may keep a "wild animal menagerie," defined as "any place where one or more bears or large cats, including cougars, lions, tigers, jaguars, leopards, pumas, cheetahs, ocelots, and hybrids of those large cats are kept in captivity for use other than public exhibition," as long as they have a permit.[289] All other exotic animals entering the state, such as reptiles, monkeys, etc., must be accompanied by a one-time entry permit and an official health certificate.[290]

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282. *See Summary of State Laws Relating to Private Possession of Exotic Animals*, BORN FREE USA, http://www.bornfreeusa.org/b4a2_exotic_animals_summary.php (last visited Sept. 30, 2011).

283. CAL. CODE REGS. tit. 14, § 671(a) (2011); *see also* 321 MASS. CODE REGS. 2.12(1) (2011).

284. CAL. CODE REGS. tit. 14, § 671.1(b)(6).

285. *Id.* tit. 14, § 671.6(a).

286. ARIZ. ADMIN. CODE § 12-4-406 (2006).

287. FLA. STAT. § 379.372(2)(a) (2011). Notice that the statute has no penalties section, and does not technically ban the release of the python.

288. *E.g.*, MICH. COMP. LAWS § 287.1105 (2011) (requiring identification for large carnivores); KAN. STAT. ANN. § 32-1303 (2011) (requiring microchip for dangerous regulated animals).

289. MONT. CODE ANN. §§ 87-4-801, -803 (2011).

290. MONT. ADMIN. R. 32.3.202 (2011).

2. Punishment

The enforcement and penalties for these laws differ state to state. For example, in California, laws impose criminal penalties that include imprisonment in a county jail for not more than six months with fines from $500 to $10,000 for each violation.[291] On the other hand, the Florida ban for pythons contains no enforcement or any section dedicated to penalties.[292]

3. Exotic Pet Amnesty Programs: Incentive and Prevention

Some states have programs to discourage pet owners from releasing their unwanted animals into the environment. The Florida Fish and Wildlife Conservation Commission (FWC) developed the annual "Pet Amnesty Day" that invites pet owners to Zoo Miami to surrender their exotic animals with no consequences.[293] A veterinarian examines each animal, and "the FWC will attempt to place all healthy animals with qualified adopters."[294] In 2010, seventy exotic pets were surrendered, including eight Burmese pythons, sixteen red-eared sliders, two parrots, and one monkey.[295] Connecticut followed Florida's lead and hosted an exotic pet amnesty day at Beardsley Zoo in collaboration with the Connecticut Department of Environmental Protection in 2009.[296] The Pet Amnesty Day is a program that could be expanded and emulated on a national scale.

4. Evaluating the Effectiveness of Individual State Statutes

The effectiveness of these laws is mixed. It can be beneficial for states to pass laws that address an identified problem, such as Florida's python ownership ban. Additionally, California's ban of exotic animal releases is a useful prevention tool. However, the lack of uniformity among state laws is troubling. The spread of invasive species is by nature cross-boundary. An animal could be legally released into the environment in one state, breed, and create populations that spread to other states. As an example, while Georgia law mandates permits for the ownership of a variety of dangerous animals, it does not require a permit

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291. CAL. FISH & GAME CODE § 2125(a) (West 2011).

292. FLA. STAT. § 379.372.

293. *Nonnative Pet Amnesty Day is March 12*, FLA. FISH & WILDLIFE CONSERVATION COMM'N (Mar. 3, 2011), http://myfwc.com/news/news-releases/2011/march/03/petamnestyday/.

294. *Id.*

295. *Id.*

296. *Successful Exotic Pet Amnesty Day*, ANIMAL PLANET (Aug. 19, 2009), http://blogs.discovery.com/animal_news/2009/08/successful-exotic-pet-amnesty-day.html.

for ownership of a Burmese python.[297] Someone in Georgia, on the border of Florida, could legally release a Burmese python, which slithers into Florida and creates populations that move further south into the Everglades. The current efforts in Florida to ban and eradicate these snakes would be undermined by an uncontrolled source north of the border.

Moreover, since enforcement of these statutes depends on funding from individual states, their utility depends on the state administration's dedication to the cause as well as budgetary constraints.[298] For example, in January 2011, outgoing Ohio Governor Theodore Strickland issued an executive order that authorized the Ohio Department of Natural Resources Division of Wildlife to adopt a rule to prevent new private ownership of wild animals that are dangerous to human health and safety.[299] The order further required that existing private owners of dangerous wild animals register the animals with the State and detail the type of facilities that can own and rehabilitate dangerous wild animals.[300] However, a few months later, the newly elected Governor Kasich stalled enforcement of this executive order due to concerns about "the rule's short-term and long-term funding, legal authority, safety, and the overall feasibility of being able to efficiently and effectively enforce such a ban."[301] Differences in opinion among states and individual actors lead to a mishmash of laws and enforcement. In October 2011, a Zanesville, Ohio man freed dozens of his pet lions, tigers, bears, and other animals and then committed suicide; an action which resulted in the death of forty-nine animals.[302] In response, Governor Kasich signed an Executive Order that pushed for a moratorium on exotic animal auctions and a crackdown on unlicensed auctions, promising to propose laws to regulate

297. *See* GA. CODE ANN. § 27-5-5 (2011).

298. *Hearing Before the Nat'l Invasive Species Council, Invasive Species Advisory Comm.* 11 (June 22, 2010) (statement of Scott Hendrick, National Conference of State Legislatures), http://www.invasivespecies.gov/global/ISAC/ISAC_Minutes/2010/ISAC_Minutes_6-2010_FINAL.pdf ("Virtually every state has had to deal with massive budget issues.").

299. Ohio Exec. Order No. 2010-17S (Jan. 6, 2011) (expired Mar. 6, 2011).

300. *Id.*

301. *Dangerous Wild Animals Emergency Rule Will Be Allowed To Expire*, OHIO DEP'T NAT. RESOURCES DIVISION WILDLIFE (Apr. 4, 2011), http://www.dnr.state.oh.us/Home/NewsReleaseArchives/Tabid/19075/EntryId/2201/Dangerous-Wild-Animals-Emergency-Rule-Will-Be-Allowed-to-Expire.aspx; *see also* Mark Kovac, *Kasich Weighs Laws on Exotic Animals*, RECORDPUB.COM (Feb. 7, 2011), http://www.recordpub.com/news/article/4976786/.

302. *Ohio Governor To Sign Exotic-Pet Executive Order*, WIVB.COM (Oct. 21, 2011, 3:44 PM), http://www.wivb.com/dpps/news/nation/midwest/ohio-governor-to-sign-exotic-pet-executive-order-nt11-tvw_3969758.

wild animals by November 30, 2011.[303] If a federal statute provided uniformity to these laws, enforcement would be clearer and more effective.

Finally, while Miami's Pet Amnesty Day is a strong mechanism for prevention, it only occurs once a year. It should be either monthly, or a service that is always available. Furthermore, while the Pet Amnesty Day is limited to exotic pets, it should be available to pets not always considered "exotic," such as cats or fish. Even though these animals are traditionally considered domesticated, they may still have devastating effects on the environment.[304]

F. Public Nuisance Tort Liability for Restoration Cost Recovery

Public nuisance tort liability may be used to prevent the spread of nonnative invasive species by deterring and punishing actors who contribute to the spread. Restatement (Second) of Torts § 821B defines public nuisance as "an unreasonable interference with a right common to the general public."[305] Interference with a public right is unreasonable where

> the conduct involves a significant interference with the public health, the public safety, the public peace, the public comfort or the public convenience, or (b) [where] the conduct is proscribed by a statute, ordinance or administrative regulation, or (c) [where] conduct is of a continuing nature or has produced a permanent or long-lasting effect, and, as the actor knows or has reason to know, has a significant effect upon the public right.[306]

Scholars note, "Since exotic species often act as pollutants, their introduction into foreign ecosystems can create public nuisances comparable to oil spills, hazardous waste discharges, and other events causing damage to public environmental resources."[307] The interference with a public right must be collective in nature. For example, if pollution prevents the use of a public bathing beach, or kills the fish in a navigable stream and deprives all members of the community of the right to fish, it

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303. Ohio Exec. Order No. 2011-24K (Oct. 21, 2011), http://governor.ohio.gov/Portals/0/pdf/executiveOrders/EO%202011-24K.pdf.

304. *See* Angela L. Strecker et al., *The Aquarium Trade as an Invasion Pathway in the Pacific Northwest*, FISHERIES, Feb. 2011, at 74; Maryann Mott, *U.S. Faces Growing Feral Cat Problem*, NAT'L GEOGRAPHIC (Sept. 7, 2004), http://news.nationalgeographic.com/news/2004/09/0907_040907_feralcats.html.

305. RESTATEMENT (SECOND) OF TORTS § 821B(1) (1979).

306. *Id.* § 821B(2).

307. Daniel P. Larsen, *Combatting the Exotic Species Invasion: The Role of Tort Liability*, 5 DUKE ENVTL. L. & POL'Y F. 21, 51 (1995).

becomes a public nuisance.[308] The damage caused by an invasive species to an ecosystem must have wide-reaching effects on the public. Remedies of public nuisance include either damages or an injunction.[309]

In the past decade, numerous scholars have argued that public nuisance claims for invasive species provide the best solution to prevent unintentional introductions of species.[310] Since the polluter bears the cost through damages, the polluter will be encouraged to develop the most cost effective methods to prevent unintentional introductions.[311] Also, by encouraging innovative solutions to the emerging exotic invasion, a wealth of new information will be discovered regarding effective methods to cope with exotics.[312]

1. Testing the Effectiveness Through the First Invasive Species Public Nuisance Case

These theories were recently put to test in the United States Court of Appeals for the Seventh Circuit.[313] Michigan, Minnesota, Ohio, Pennsylvania, and Wisconsin sued the U.S. Army Corps of Engineers (USACE), under federal common law public nuisance.[314] The states asserted that the USACE created a grave risk of harm because they had not taken the comprehensive actions necessary to abate the spread of invasive silver and bighead carp (Asian carp) from the Chicago Area Waterway System (CAWS) to the Great Lakes.[315] Specifically, the plaintiffs argued that, "[I]f established in the Great Lakes, Asian carp could cause physical injury to boaters and drive out native fish species sought by sport and commercial fisher[men]."[316] The states moved for a preliminary injunction that would require the defendants to put in place additional physical barriers, like closing locks, throughout the CAWS, implementing new procedures to stop invasive carp, and expediting a

308. *Id.* at 52-53.

309. Armory Park Neighborhood Ass'n v. Episcopal Cmty. Servs. in Ariz., 712 P.2d 914, 918 (Ariz. 1985) (in banc).

310. Matthew Shannon, *From Zebra Mussels to Coqui Frogs: Public Nuisance Liability as a Method to Combat the Introduction of Invasive Species*, 32 ENVIRONS ENVTL. L. & POL'Y J. 37, 61 (2008); *see also* Larsen, *supra* note 307, at 36-38.

311. Larsen, *supra* note 307, at 37.

312. *See* Michigan v. U.S. Army Corps of Eng'rs, No. 10-CV-4457, 2010 U.S. Dist. LEXIS 127376, at *36-37 (N.D. Ill. Dec. 2, 2010).

313. Michigan v. U.S. Army Corps of Eng'rs, No. 10-3891, 2011 U.S. App. LEXIS 17714 (7th Cir. Aug. 24, 2011).

314. *Id.* at *4-5 (citing Am. Elec. Power Co. v Connecticut, 131 S. Ct. 2527 (2011)).

315. *Id.*

316. Michigan v. U.S. Army Corps of Eng'rs, No. 10-CV-4457, 2010 U.S. Dist. LEXIS 127376, at *67 (N.D. Ill. Dec. 2, 2010), *aff'd*, 2011 U.S. App. LEXIS 17714.

study of how best to separate the Mississippi and Great Lakes watersheds permanently.[317] The United States District Court for the Northern District of Illinois denied the preliminary injunction and the Seventh Circuit affirmed.[318]

In an action for a preliminary injunction, the plaintiff must show that (1) they are likely to succeed on the merits of their claims, (2) they are likely to suffer irreparable harm without an injunction, (3) the harm they would suffer without the injunction is greater than the harm that preliminary relief would inflict on the defendants, and (4) the injunction is in the public interest.[319] The Seventh Circuit determined that the states were likely to succeed on the merits of the claim and were likely to suffer irreparable harm.[320] However, the preliminary injunction would cause significantly more harm than it would prevent and "competent federal and state actors are actively pursuing an array of efforts to solve the problem of invasive carp."[321]

While the plaintiffs did not ultimately prevail, the Seventh Circuit case provides new precedent that the spread of invasive species falls under the purview of a public nuisance and that such a claim could succeed on its merits. The Seventh Circuit stated, "It would be arbitrary to conclude that [public nuisance] extends to the harm caused by industrial pollution but not to the environmental and economic destruction caused by the introduction of an invasive, nonnative organism into a new ecosystem (assuming that the states have correctly forecast the depletion of the Great Lakes fishery and the corresponding damage to the multi-billion-dollar sports fishing industry)."[322] The Seventh Circuit, agreeing with the district court, noted that the magnitude of the potential harm was tremendous, and the risk that the "harm will come to pass may be growing with every passing day."[323]

However, the court did not grant a preliminary injunction because, under the third prong, the costs associated with the preliminary injunction outweighed the benefits for reducing the risk of invasive carp establishing themselves in Lake Michigan in the near future.[324] For example, closing the locks would not reduce the probability of invasive

317. Michigan v. U.S. Army Corps of Eng'rs, 2011 U.S. App. LEXIS 17714, at *70-71.
318. *Id.* at *100.
319. *Id.* at *7-8 (citing Winter v. Natural Res. Def. Council, Inc., 555 U.S. 7, 20 (2008)).
320. *Id.* at *57.
321. *Id.* at *87.
322. *Id.* at *13-14.
323. *Id.* at *55.
324. *Id.* at *86.

carp entering the lake to zero, but could substantially heighten costs for public health and safety measures.[325]

Furthermore, the court considered whether the cause of action under public nuisance was displaced by a comprehensive federal statute and therefore not available to the plaintiffs.[326] The cause of action may have been displaced if the comprehensive statute was enacted to fully address invasive species.[327] The federal statute must address a question previously the subject of federal common law.[328] The district court found that the statute cited by the defendant, the Aquatic Nuisance Species Control Program, 16 U.S.C. § 4722(i)(3), was "not a comprehensive program for preventing Asian carp introduction and establishment in the Great Lakes."[329] The Seventh Circuit agreed stating that "For better or for worse, congressional efforts to curb the migration of invasive species, and of invasive carp in particular, have yet to reach the level of detail one sees in the air or water pollution schemes."[330] Therefore, the cause of action had not been displaced. In the event a federal comprehensive invasive species statute is enacted, it may have the effect of displacing this common law cause of action, which could prevent litigants from recovering for damages resulting from nonnative invasive species.

2. Assessment of Public Nuisance's Effectiveness for Recovery and Prevention

The Seventh Circuit's recent decision in *Michigan v. U.S. Army Corps of Engineers* demonstrates that success on the merits of a public nuisance claim related to invasive animal species is possible. Ample science and compelling economic statistics related to the harm will help. However, a request for a preliminary injunction may not succeed where the plaintiff cannot clearly show that the benefits outweigh the costs of their suggestions. Moreover, if a federal statute already clearly regulates and enforces a behavior, then a public nuisance action may be displaced. This cause of action may be useful where an invasive species has already

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325 *Id.* at *75-76.

326. *Id.* at *29-40.

327. *Id.* at *31.

328. *Id.*

329. Michigan v. U.S. Army Corps of Eng'rs, No. 10-CV-4457, 2010 U.S. Dist. LEXIS 127376, at *64 (N.D. Ill. Dec. 2, 2010). "The Court stated, '[u]ntil the field has been made the subject of comprehensive legislation or authorized administrative standards, only a federal common law basis can provide an adequate means for dealing with such claims as alleged federal rights.'" *Id.* at *61 (alteration in original) (quoting Illinois v. City of Milwaukee, 406 U.S. 91, 108 n.9 (1972)).

330. Michigan v. U.S. Army Corps of Eng'rs, 2011 U.S. App. LEXIS 17714, at *35.

or is likely to cause devastation to an area that is directly traceable to the actions of an actor, such as Asian carp in the Great Lakes. However, in many cases, it will be difficult to assess what damage was done by whom. For example, imagine that a python owner releases their pet into the Everglades, and that pet breeds with another released python, creating ten new pythons. Without better technology, it is practically impossible to connect previous owners of released invasive species with the offspring of those species. Thus, public nuisance claims may work well in situations where actions with devastating consequences can be tied to direct actors, but may not work well in isolated incidents that cannot be attributed to a party or when officials cannot determine if harm has occurred.

G. Incentives To Promote Free Market Solutions for Control and Eradication

A largely unexplored option is to encourage market forces to combat the spread of nonnative invasive species through positive incentives associated with prices, profit, and entrepreneurship and with voluntary partnerships between the government and private businesses or nonprofit organizations.[331] In concrete terms, this translates into Asian carp served on menus and nutria used for fabric and jewelry. This is already happening without the aid of federal intervention. In response to Asian carp crowding out catfish and other carp in the Mississippi River, several businesses have responded to the change in supply by selling Asian carp to distributors and serving them on menus.[332] The distributor Big River Fish sold about two million pounds of Asian carp in 2005 to distributors.[333] In some cases, these businesses have a symbiotic relationship with state and federal programs to rid ecosystems of invasive species with incentives.

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331. *See* TERRY L. ANDERSON & DONALD R. LEAL, FREE MARKET ENVIRONMENTALISM (rev. ed. 2001); *see also* ROBERT H. NELSON, FREE-MARKET ENVIRONMENTALISM: A BRIEF HISTORY AND OVERVIEW (Sept. 2001), http://www.publicpolicy.umd.edu/files.php/faculty/nelson/institutional/Free_Market_Environmentalism.pdf.

332. Phil Vettel, *That Pesky Asian Carp: Its What's for Dinner*, CHI. TRIB., Apr. 22, 2010, http://articles.chicagotribune.com/2010-04-22/entertainment/ct-play-0422-vettel-asian-carp-taste-20100421_1_carp-sea-bass-fish.

333. *History of Big River Fish*, BIG RIVER FISH, http://www.bigriverfish.com/history.php (last visited Oct. 7, 2011).

1. Grant Programs, Funding Sources, and Voluntary Partnerships for Incentives

Incentives and other grant programs from federal and state governments encourage private enterprises to develop innovative projects. For example, Righteous Fur, a Louisiana fashion business, uses the fur and teeth of invasive nutria, a small aquatic rodent, to create innovative clothing and jewelry.[334] Their supply of nutria is aided by the Coastwide Nutria Control Program, funded by the Coastal Wetlands Planning Protection and Restoration Act through the Louisiana Department of Natural Resources and Natural Resources Conservation Service.[335] The program pays economic incentives of $5 per nutria tail delivered by registered participants to collection centers established in coastal Louisiana, and encourages the harvest of up to four hundred thousand nutrias in coastal Louisiana annually.[336] The Coastwide Nutria Control Program subsidizes nutria hunting, which then supplies Righteous Fur with the raw materials.[337]

Other grant programs help landowners manage invasive species on their land. For example, the USDA's Natural Resources Conservation Service funded projects in twenty states, totaling over $4.1 million to help limited resource farmers and ranchers and tribes control and manage invasive species.[338] The Pulling Together Initiative (PTI) solicited proposals to help control invasive plant species, mostly through the work of public and private partnerships.[339] The project only accepted applications from "private non-profit (501)(c) organizations, federally recognized Tribal governments, local, county, and state government agencies, and from field staff of federal government agencies. Individuals and for-profit businesses are not eligible to receive PTI grants, but are encouraged to work with eligible applicants to develop and submit applications to PTI."[340] PTI currently only addresses invasive

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334. *See* RIGHTEOUS FUR, http://www.righteousfur.com (last visited Oct. 9, 2011).

335. *Coastwide Nutria Control Program (LA-03b)*, LACOAST.GOV (Oct. 2002), http://lacoast.gov/new/Data/Ed/LA-06b.pdf.

336. *Id.*; *Coastwide Nutria Control Program Application Instructions*, NUTRIA.COM, http://www.nutria.com/site10.php (last visited Oct. 9, 2011).

337. *See Coastwide Nutria Control Program Application Instructions*, *supra* note 336.

338. *Proposals Selected for Funding from the "Announcement of Funding for the Management and Control of Invasive Species Affecting Grazing Land,"* NAT. RESOURCES CONSERVATION SERV. (July 28, 2006), http://www.or.nrcs.usda.gov/programs/glci/glci-data/GLCI-tom.pdf.

339. *Pulling Together Initiative*, NAT'L FISH & WILDLIFE FOUND., http://www.nfwf.org/AM/Template.cfm?Section=Charter_Programs_List&CONTENTID=20363&TEMPLATE=/CM/HTMLDisplay.cfm (last visited Oct. 9, 2011).

340. *Id.*

plant species, and should be expanded to address invasive animal species. These programs could be linked in a national program to supply businesses, like Righteous Fur, invasive species as raw materials at low or no cost. Grants could aid business development and marketing.

Finally, voluntary partnerships between governmental entities and private enterprise can address invasive species control. For example, the Florida Invasive Species Partnership is a collaborative program between federal, state, and local agencies with nongovernment organizations to manage invasive nonnative species in Florida.[341] This program encourages the development of "voluntary partnerships, such as Cooperative Invasive Species Management Areas[, and p]rovides information and contacts on incentive programs for private landowners."[342] The Early Detection and Mapping System provides a picture of the distribution of specific invasive species across the region.[343]

2. Obstacles to Incentive Programs

While the free market provides a means to rid ecosystems of selected invasive species, there are challenges. Marketing an invasive species product may not initially appeal to consumers. Righteous Fur advertises nutria as a luxury item from Hollywood's golden age, "worn by style icons like Greta Garbo, Elizabeth Taylor, [and] Sophia Loren,"[344] but reporters still portray nutria as a rodent.[345] Lockwood, an upscale Chicago restaurant offered "Asian carp-accio" to diners for free last year.[346] When it failed to attract popularity, Chef Phillip Foss tried to rename it "Shanghai Bass," but the dish was soon discontinued indefinitely.[347] The stigma of an invasive species in an upscale restaurant

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341. *Invasive Species Know No Boundaries—Neither Do We*, FLA. INVASIVE SPECIES PARTNERSHIP, http://www.floridainvasives.org (last updated Oct. 4, 2011, 3:05 PM).

342. *Id.*

343. *EDDMaps: Early Detection and Distribution Mapping System*, EDDMAPS, http://www.eddmaps.org/about/ (last updated Aug. 19, 2011, 11:06 AM). This program is based out of the University of Georgia. *Id.*

344. RIGHTEOUS FUR, *supra* note 334.

345. Nicole Pasulka, *Invasion of the Bayou Snatchers*, MORNING NEWS (June 1, 2010), http://www.themorningnews.org/article/invasion_of_the_bayou_snatchers; *see* Susan Langenhennig, *Trapped!—Environmental Advocates Are Promoting Nutria Fur as a Way To Help Save the Wetlands*, TIMES PICAYUNE (New Orleans), Jan. 18, 2010, at C1, *available at* http://www.nola.com/fashion/index.ssf/2010/01/post_6.html.

346. Josh Mogerman, *Free Asian Carp Dish from a Man on a Mission*, CHICAGOIST (Apr. 10, 2010, 2:00 PM), http://chicagoist.com/2010/04/10/many_chefs_in_town_have.php.

347. *Phillip Foss Rebrands the Asian Carp*, GRUB STREET CHI. (Apr. 19, 2010, 11:30 AM), http://chicago.grubstreet.com/2010/04/phillip_foss_renames_asian_car.html; *see also* Phillip Foss & Andrew Brochu, *Getting Carped Out*, PICKLED TONGUE (Apr. 10, 2010, 11:52 PM),

was too difficult to overcome. On the other hand, an industry aimed at destroying an invasive species may become a victim of its own success. If a business depends on a certain species for supply, it is against its best interests for the species to become unavailable. As Righteous Fur's popularity grows, there will be higher demand, and more nutria will be hunted.[348] If nutria does become scarce, the demand may encourage the breeding of nutria for fur and result in the accidental release of nutria back into the ecosystem.[349] This would only continue the cycle of destruction. Additionally, while the voluntary partnerships facilitate cooperation between different actors, they do not exist throughout the country yet. Finally, what entity would provide funds for these incentive programs? One solution may be to establish a trust funded through fines and penalties from a more vigorous enforcement regime. While there are some concerns to promoting incentive programs, they should be further explored.

H. Conclusion—The Patchwork of Other Laws Still Has Holes

As illustrated here, a variety of tools not specifically designed to address invasive species can be used for that purpose. However, the analysis demonstrates wide gaps in the scope of regulations. While NEPA, the CWA, the ESA, and the AHPA offer a variety of preventative and enforcement tools to curb the spread of invasive species, their scopes are limited to federal actions, invasive species in the water, impacts to federally listed species, and impacts to livestock, respectively. State statutes and programs limit the possession and release of exotic species through prevention and punishment. But there is a lack of uniformity across state lines regarding the specific type of animals banned, the permitting process, whether the ban is for both possession and release or just possession, and penalties. Additionally, while public nuisance is a potential tool for cost recovery or an injunction, litigants have not yet brought a successful case. Finally, methods to control the spread of invasive species are starting to burgeon naturally in the free market, although incentives to help these creative fixes are few and far between.

With these multiple gaps in regulation, there are numerous situations that would escape the scope of these laws and allow the problem of invasive species to persist. For prevention, the actions of individuals and corporations are not reached. In regard to punishment,

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http://thepickledtongue.com/?p=5798 (detailing more information, including the extra expense caused by deboning and cleaning the fish).

348. Pasulka, *supra* note 345.

349. *Id.*

there is nothing to punish someone for releasing a python in Georgia that reaches Florida. Incentives to restrict the release or capture of invasive species are limited. These gaps strongly suggest the need for a comprehensive statute.

V. FRAMEWORK FOR A PROPOSED COMPREHENSIVE INVASIVE NONNATIVE SPECIES ACT (CINSA)

This Part evaluates and consolidates the thesis' ideas into a model federal comprehensive invasive species statute. Returning to the rubric explained in Part II, it will articulate several concrete suggestions for each section.

A. Prevention

As the analysis of existing statutes shows, the prevention framework is inadequate. Instead of proactively restricting the spread of invasive species, the Lacey Act reacts after individual species have caused problems. A comprehensive statute could change the current dirty list approach to a clean list along with a companion permitting system that places the onus on users to affirmatively demonstrate the lack of risk in transporting, importing, or selling an animal. A more detailed mechanism for risk assessment, such as the development of a national mapping database that shows where and how specific invasive species are spreading, could be pursued. Uniform bans, permits for exotic animal pet ownership, as well as mandatory microchipping will be important parts of the statute, although the specific details would need to be determined. For public awareness and notice of these laws, there could be a publicly accessible database available at various interstate and international border crossing points.

1. Reforming the Dirty List into a Clean List

There should be a clean list of species that are allowed into the country, instead of the current dirty list that prohibits specific species. To ease confusion, the current list of injurious species under 18 U.S.C. § 42 of the Lacey Act could sunset while the new regulations take effect and are eventually superseded. The Nonnative Wildlife Invasion Prevention Act "list of approved species" provides a framework for the development of a clean list. This list would have contained species that are not harmful to the United States' economy, the environment, or other animal species' or human health. The list also included species that may be harmful but are already so widespread in the United States that it is clear

that any restrictions would have no practical utility.[350] The Nonnative Wildlife Invasive Prevention Act also created a dirty list, but this does not seem necessary because a species can only be imported or brought across borders if it is on the clean list. An additional list would be confusing and would undercut the purpose of the change.

The new statute could place the onus on importers, transporters, and other persons involved in the wildlife trade to petition for a specific animal to be placed on the clean list. If a specific company or individual wants a species to be listed on the clean list, they could pay a small fixed fee for the assessment to be completed. The assessment could be completed by an unbiased group of experts affiliated with universities and governmental officials. To avoid corruption, special interests will either have no role or a very limited role in this assessment. After a while, the clean list will develop as market forces use it. If a corporation or individual then wants to import, trade, or transport such species, they must apply for a permit. Listing on the clean list, as well as permits, may be conditional, meaning that the user can import a certain species to an area if there is little risk. For example, if someone wants to sell Burmese pythons in Alaska to a pet store, this potentially could be acceptable if it can be shown that a Burmese python poses a very low probability of risk of damage to the Alaska ecosystem or nearby ecosystems. If a species on the clean list is determined to cause a problem, it will be immediately suspended, and a specific permit holder will have to show within a specified time period that the species is not linked to the problem or contributing to the problem.

2. Improving the Risk Assessment Process

The risk assessment process will need to explain exactly how these decisions will be determined. A series of factors will be evaluated, including:

> (2) the native range of the species; (3) whether the species has established or spread, or caused harm to the economy, the environment, [and] human health in [domestic] ecosystems in or ecosystems that are similar to those in the United States; . . . (5) the likelihood of establishment . . . ; (6) the likelihood of spread of the species in the United States; . . . (8) the likelihood that the species would harm [wildlife]; (9) . . . habitats or ecosystems . . . .[351]

350. Nonnative Wildlife Invasion Prevention Act, H.R. 669, 111th Cong. § 4 (1st Sess. 2009).

351. *Id.* § 3(b).

A companion guidance document will need to be created. New Zealand has a detailed guidance document for explaining the risk assessment method, which could be used for direction.[352] Additionally, since the United States is a large area with a variety of different ecosystems, the risk assessment process should include assessments of impacts of species across state and ecosystem lines. For example, nutria establish populations in wetlands.[353] While coastal Louisiana is already suffering, there should be special risk assessments for whether or how nutria would establish populations in other coastal wetlands in the United States, such as portions of South Florida.

Tools such as the Invasive Species Specialists Group's Global Registry of Invasive Species (GRIS) database could be used as decision trees and models.[354] Additionally, there should be an invasive species mapping system like the one offered by University of Georgia's Early Detection and Distribution Mapping System on a national scale.[355] This project maps the documented range of various invasive species throughout Florida and several other southeastern states.[356] Since this project will require local information on a national scale, it may be proper to farm out the information gathering process to universities or state agencies.

3. Establishing Uniform Restrictions on Exotic Animal Ownership

The comprehensive statute should include limits on exotic, and potentially all, animal ownership. The exact details would need to be determined after a discussion with different states and stakeholders. Since the core of the problem is not ownership of a pet, but release of a pet into the environment, there should be a ban on the release of pets into the environment, accompanied by hefty fines. This could apply to all animals foreign to the ecosystem in which they live, which may include domesticated animals such as cats. There should also be bans on ownership of animals that have been shown to be extremely dangerous,

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352. BIOSECURITY N.Z., RISK ANALYSIS PROCEDURES, VERSION 1 (Apr. 12, 2006), http://www.biosecurity.govt.nz/files/pests/surv-mgmt/surv/review/risk-analysis-procedures.pdf; *see also* BIOSECURITY N.Z., REQUEST FOR DEVELOPMENT OF AN IMPORT HEALTH STANDARD (Jan. 2010), http://www.biosecurity.govt.nz/files/regs/imports/animals/forms/ihs-request-animal-product.pdf.

353. *Nutria, Eating Louisiana's Coast*, U.S. GEOLOGICAL SURVEY 1 (June 2000), http://www.nwrc.usgs.gov/factshts/020-00.pdf; *Nutria, A Rat-Like Pest Ravaging Gulf Coast Wetlands, Can Be Lured with New Substance*, SCI. DAILY (Mar. 10, 2008), http://www.sciencedaily.com/releases/2008/03/080306094624.htm.

354. *See* JENKINS ET AL., *supra* note 24, at 32.

355. *See EDDMaps: Early Detection and Distribution Mapping System*, *supra* note 343.

356. *Id.*

either from a public safety or ecological standpoint. Finally, to improve identification of animals that have been released, pets should be microchipped. While some states do have microchipping programs, it does not make sense to have a patchwork of state laws when an escaped animal can travel across borders. Once the uniform framework is eventually established, it could avoid confusion and provide a unified front in the war against invasive species.

B. Increase Public Awareness of Laws Through Enhanced Notice Procedures

The assessment of the Lacey Act showed that lack of notice as well as vagueness are problems when foreign or out of state laws are applied. In an effort to create further notice to international and interstate travelers of the potential criminal and civil liabilities arising under this new statute, as well as 16 U.S.C. § 3373, a coordinated federal and state program can enhance awareness of restrictions at interstate and international border crossings. The new clean list should be accessible online, and searchable by state, country, species, and business type.

1. Punishment

For effective enforcement of these laws, there needs to be penalties that correspond fairly with violations of this law. The punishment mechanism needs to be consistent across the country, with uniform penalties for violations. There will need to be a deeper look into assessing the fairness of monetary fines and criminal penalties. New Zealand's model of enforcement could be emulated. In the New Zealand Biosecurity Act, there are higher penalties for corporations than there are for an individual with unauthorized goods, or to those who buy, sell, exchange, or otherwise acquire or dispose of those goods.[357] Whereas a fine for an individual person is up to $100,000, the fine for corporations is up to $200,000.[358] Fines this high should correspond to truly egregious offenses. On the other hand, penalties should not be too harsh for minor violations so as to instill mistrust in the system. Currently, the Lacey Act is suffering from this type of mistrust and alleged "overcriminalization."[359] Any penalties and methods of enforcement must be sensitive to

357. Biosecurity Act 1993 § 157 (N.Z.).

358. *Id.*

359. Michael Johnson, *Congress Reviewing "Overcriminalization,"* EXAMINER.COM (Oct. 4, 2010), http://www.examiner.com/civil-rights-in-miami/congress-reviewing-overcriminalization.

this idea and avoid absurd results. There will need to be further analysis to determine appropriate penalties.

2. Cost Recovery

The model comprehensive statute should include methods to fund the restoration of ecosystems damaged by invasive species. The APHA's cost recovery clause is extremely limited to impacts on livestock.[360] While the APHA's scope is limited to impacts on livestock, the statute serves as a model that requires those responsible to help with cleanup through the polluter pays principle. Another possibility is to use the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as a model, which provides a framework for cost recovery and cleanup from the spill of hazardous substances.[361] Unlike the ESA or CWA or New Zealand's Biosecurity Act where there are fixed fines for specific violations, CERCLA requires cost recovery for assessing the injury and restoring the site, in addition to fixed fines. Like CERCLA, there could be limited defenses, including an act of God, an act of war, an act or omission of a third party, or any combination of these defenses.[362]

Cost recovery for damages due to the spread of invasive species can be problematic because it is difficult to tie a specific ecological problem to a specific person who released the animal. The microchipping program as explained in Part IV.E.1 will aid this effort, but does not solve the problem of finding liability of damage to an ecosystem from unidentified species that were never microchipped. One possibility is to create a statutory based market share liability, apportioning the clean-up costs on numerous defendants based on each defendant's share of the market. In *Sindell v. Abbott Laboratories*, the plaintiffs, girls allegedly injured by their mothers' ingestion of the drug diethylstilbestrol (DES) were unable to identify the specific manufacturer of the drugs taken by their mothers.[363] The court adopted the theory of market share liability based on the principle that between innocent plaintiffs and negligent defendants, the latter should bear the cost of injury.[364] Once plaintiffs

360. 7 U.S.C. § 8303(a)(1) (2006).

361. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §§ 9601-9675 (2006). For a creative look at how CERCLA applies to Everglades restoration, see Alfred R. Light, *Of Square Pegs, Round Holes and Recalcitrants Lying in the Weeds: Superfund's Legal Lessons for Everglades Restoration*, 12 MO. ENVTL. L. & POL'Y REV. 91, 124 (2005).

362. 42 U.S.C. § 9607(b).

363. 607 P.2d 924, 932 (Cal. 1980).

364. *Id.*

joined the manufacturers of a substantial percentage of DES, defendants were required to prove they could not have manufactured the injury-causing product.[365] Absent such proof, liability for damages could be apportioned based on each defendant's share of the appropriate market.[366]

Likewise, in the case of damage caused from the release of Burmese pythons in the Everglades, all pet store owners who sell pythons could potentially be jointly liable, and they would have the burden to prove that they were not the cause of the released python. In the context of cost recovery for invasive species, this idea should be further explored.

3. Incentives

Finally, a comprehensive federal invasive species statute could harness and encourage market forces, emphasizing incentives associated with entrepreneurship and voluntary partnerships between the government and private businesses. The statute could lay the groundwork for a federal funding program that incentivizes small businesses to use invasive species caught by state wildlife agencies as materials. Tax breaks for these businesses could be passed. Miami's Pet Amnesty Day program should be expanded to states with severe invasive species problems.

The qualifications for these programs would have to be developed to set parameters for whether only certain invasive species would qualify and whether there should be caps on the quantity of invasive species taken for materials. If businesses start depending on a specific invasive species, there is a danger that once that species is almost hunted to extinction, there will be attempts to perpetuate the population simply to keep the business going. To respond to these concerns, the statute will have to have clear rules on when a species may not be used for this program. While these programs raise a series of questions, they should be further explored.

C. Concluding Thoughts

As you can see, current U.S. laws dealing with the critical problem of invasive species are lacking central pieces and are uncoordinated. A new comprehensive statute could improve mechanisms for prevention, punishment, cost recovery, and incentives. The suggestions raise a series of further questions that should be further explored. For example, what are the constitutional implications? Do the concepts of federalism and

365. *Id.* at 937.
366. *Id.*

the Commerce Clause present obstacles to such a statute? In the current dire economic climate, will funding be available, and if so, from what sources? Which federal agencies will be in charge of implementing the statute? With the impacts of invasive animal species on America's ecology, economy, public health, and personal safety, there must be something done to coordinate the current patchwork of laws. Can we work through these questions to create a feasible framework?