COMBATTING THE EXOTIC SPECIES INVASION: THE ROLE OF TORT LIABILITY

DANIEL P. LARSEN*

INTRODUCTION

Present-day island and continental ecosystems began evolving millions of years before the human species appeared. These ecosystems became distinct as they developed in isolation from one another, due to natural barriers between them. Within the last 150 years, however, technology has enabled humanity to easily bridge continents and reach secluded islands. As a result, modern human vectors of transport are introducing exotic species into ecosystems that have evolved autonomously for millions of years. Often, these non-native, immigrant species impact wildlife and ecosystem interactions so severely that they may be thought of as deadly "pollutants."

Traditionally, environmental laws have only been concerned with human management, or mismanagement, of inanimate substances. Only recently have environmental laws begun to address the exotic species problem. Thus far, however, modern federal legislation enacted in response to damage caused by exotic species inadequately confronts the threat.

A viable solution to encourage transporting behavior which prevents exotic introductions may be based upon common law public nuisance and strict liability. Tort liability provides more flexibility to adapt to changing circumstances than rigid statutes and allows the

* Daniel P. Larsen currently clerks for the Honorable Robert E. Jones of the United States District Court for the District of Oregon. He received his J.D. from Northwestern School of Law at Lewis and Clark College, and his B.S. from University of Wisconsin—Madison. The author thanks Professor James Huffman for his insightful comments, and expresses deep gratitude to Antonia DeMeo who performed abundant onerous tasks in connection with this article. Finally, the author dedicates this article to his mother, who endured countless late nights editing last-minute grade school and high school research papers so they could be completed on time.

1. The term "exotic species" refers to plant and animal species which are found outside of their native habitat.

transporter to choose the most efficient method to avoid liability. Therefore, adaptable tort principles may represent the best means by which our most valuable resources, our ecosystems, can be protected from destructive exotic species.

This Article advocates the use of liability-based principles from nuisance law to combat the tide of exotic introductions. Section I details the destructive power of some exotic species on non-native ecosystems and illustrates the threat posed by future introductions. Section II discusses the present federal regulatory approach to exotic species introductions. This section includes both indirect and direct federal legislation to combat exotics, as well as an administrative reaction to the exotics problem. Section III examines how tort liability, specifically the law of public nuisance, can be applied to environmental harms. Lastly, Section IV analyzes each element necessary for a public nuisance suit and concludes by illustrating how public nuisance law provides a foundation which can be modified to effectively confront the exotic species threat.

I. THE INVASION

For years, complex ecosystems have been victims of a silent assault caused by the introductions of exotic species. "Ecologists have chronicled such introductions for decades . . . [b]ut in recent years, they have approached the exotic species problem with new urgency, increasingly alarmed at what invasion experts such as Ted Case of the University of California, San Diego, call 'the homogenization of the world.'" To understand why ecosystems are so vulnerable, it is helpful to trace their development.

Two-hundred and fifty million years ago, the Earth's entire land mass consisted of a single giant continent that geologists refer to as Pangaea. Fifty million years later, the continents began to break apart and drift towards their present locations, isolating species of plants and animals on the different land masses. Once isolated, they evolved in response to their changing habitat and companion species. About 500 years ago, however, this autonomous evolution ended in many regions as humans started to reconnect the pieces of Pangaea through shipping and, more recently, air travel.

5. Id.
6. Id.
Consequently, the natural barriers that developed over millions of years are being broken down as the descendants of the species of Pangaea are reunited. These reunions allow exotic species to live within new ecosystems that may not have the same natural restraints, such as predation, competition for food, and disease, which exist in the exotic species' indigenous habitat. Absent nature's checks on an exotic species' growth and reproduction, the exotic species population is capable of growing exponentially within the new ecosystem. Prolific exotic species typically transform unprotected ecosystems by predation, competition, altering landscapes, or a combination of the three.

The European wild pig illustrates the effect one species can have upon a nonindigenous habitat. The European wild pig was imported into North Carolina in 1912 by a wealthy sportsman for hunting. Facing few predators, the boars spread through the 520,000 acres comprising the Great Smoky Mountains National Park. The omnivorous boars eat anything smaller than themselves, such as roots, bulbs, flowers, frogs, snakes, rodents, ground-dwelling birds, and eggs. Armed with powerful, sharply-edged hoofs for digging and an indiscriminate appetite, the boars have wreaked havoc on the park's ecosystem by predation, competition, and habitat modification. In 1986, the National Park Service attempted to eradicate the boars; however, at the cost of $175,000 to $225,000 per year, the Park Service may have to abandon its efforts because of insufficient funds. Thus, the boar population could be left to multiply unrestrained.

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7. Id. at 52-53. However, not every introduction of an exotic species results in catastrophe; only about 10% of established immigrants have major effects. Culcotta, supra note 3, at 1446.
8. Culcotta, supra note 3, at 1444.
11. Id.
12. Id.
13. Similar patterns of introduction and destruction have been seen with the intentional introduction of mountain goats to Washington's Olympic National Park. Charles Bergman, The Mountain Goat Foments Trouble in a Fragile Paradise, SMITHSONIAN, Aug. 1984, at 102, 103. Additionally, since their initial introduction into the Hudson River in 1830, European Carp have prospered at the expense of the native aquatic ecosystems by removing vegetation and stirring up bottom sediment. Jon Luoma, Boon to Anglers Turns into a Disaster for Lakes and Streams, N.Y. TIMES, Nov. 17, 1992, at C4.
A more recent unintentional introduction is the zebra mussel, which has become infamous in the Great Lakes area. In the mid-1980's, the mussel hitched a ride from Europe in the ballast water of ocean-going ships. In the absence of their natural predators and parasites in Europe, the mussel proliferated because it reproduces with incredible swiftness. As a result, its population has become so great that densities have reached more than 700,000 zebra mussels per square meter in Lake Erie, thus covering nearly every solid underwater object, especially water intake pipes. Furthermore, the huge number of mussels deplete the water of phytoplankton, microscopic plants which are the building blocks of the food chain. By removing the phytoplankton, the mussel sends shockwaves through the entire ecosystem as it effectively out-competes all other species for food.

Most importantly, the zebra mussel has brought the topic of exotic species into the limelight. It is unique because it caused unprecedented economic damage. The cost of cleanup and re-design of piping for utilities that rely on the Great Lakes for water is expected to be around $5 billion for the decade. Such costs have alerted people to the emerging exotic threat to ecosystems, particular-

16. The mussel expends half its body weight in gametes during spawning. Culcotta, * supra* note 3, at 1447. Furthermore, unlike native mussel larvae, which disperse themselves by attaching to fish, zebra mussel larvae are veligers, meaning that each possesses a clump of cilia, allowing them to swim freely and ride the currents. Hart, * supra* note 14, at 81. Ironically, the environmental clean-up of harbors starting in the 1970's in both Europe and North America may be partly responsible for the mussel infestation because it provided the requisite water quality for habitability. Hart, * supra* note 14, at 81.
18. It is estimated that zebra mussels filter all the water in Lake St. Clair (located between Lake Erie and Lake Huron) several times daily. Yount, * supra* note 4, at 52.
19. For instance, zooplankton feed on phytoplankton, larval and small fish feed on zooplankton, and larger predatory fish prey upon the smaller fish. Therefore, with less phytoplankton, the ecosystem's chain links are removed and species collapse. See Larry Green, *Invasion of the Zebra Mussels Threatens U.S. Waterways*, L.A. TIMES, Jan. 15, 1990, at A1, A15 ("If 50% of the [food] is being consumed by the zebra mussel, something has to be starving") (quoting ecologist Ronald W. Griffiths).
ly in light of the opening of new trade routes with China and the increasing number of Eastern European ships entering the North American ecosystem.\(^\text{22}\)

Perhaps no American ecosystem has felt the scourge of exotic species more severely than the Hawaiian Islands. "Hawaii is Earth's most isolated archipelago."\(^\text{23}\) For 70 million years the Hawaiian ecosystem proved nearly inaccessible.\(^\text{24}\) Ecologists estimate that a new species entered its ecosystem only once every 100,000 years, which allowed significant time for adjustment.\(^\text{25}\) The absence of predators and mammals has contributed to the lack of developed defense mechanisms among Hawaii's native species.\(^\text{26}\) The Islands evolved with only one land mammal, a cave dwelling bat, and the predators at the top of the food chain were wolf spiders and carabid beetles.\(^\text{27}\) The lack of predatory animals allowed birds to become flightless or ground-nesters, and to produce only one chick per reproduction cycle.\(^\text{28}\) Moreover, thorns, thistles, toxins, and odors employed by plants to protect themselves from herbivorous mammals slowly disappeared.\(^\text{29}\)

The introduction of the rat in Hawaii by early American settlers and the subsequent introduction of the mongoose in 1883, to eradicate the rats, were two of the first mammalian invaders.\(^\text{30}\) However, since the rat was nocturnal and the mongoose diurnal, the two mammals compounded their damaging effect on the environment by eating native bird eggs and ground-nesting birds.\(^\text{31}\) Nearly forty percent of the native birds have become extinct.\(^\text{32}\)

\(^{22}\) Also, larger and faster ships make the journey less taxing to ballast water hitchhikers. Marguerite Holloway, *Musseling In*, Sci. Am., Oct. 1992, at 22, 22. According to the Transportation Institute in Washington, D.C., the international fleet consists of 39,896 merchant vessels. *Id.*


\(^{24}\) *Id.*

\(^{25}\) *Id.*

\(^{26}\) *Id.*

\(^{27}\) *Id.*


\(^{29}\) See id. ("the thorns on the raspberry bush turned to soft fuzz... [and] [t]he native mint lost its protective odor").

\(^{30}\) *Id.*

\(^{31}\) *Id.*

\(^{32}\) *Id.*
Another troublesome introduction of an exotic species occurred in 1950, when an exotic snail was introduced in Hawaii to control another alien garden pest. However, the exotic snail preferred the taste of native Oahu tree snails and decimated the population.

Unintentional introductions of exotics via airplanes, products, and people entering Hawaii every day are also frightening. An example is the brown tree snake which travels in the wheel wells of airplanes from Guam and finds easy prey among the native birds and their eggs. Other examples include insects which are imported into the Hawaiian ecosystem through the mail and shipments of fruit. One such insect, the yellow-jacket wasp, has devastated the fruit fly population. Fruit fly larvae help recycle forest nutrients by eating decaying fruit and plant matter, while the adults play a role in pollination. The effect of the elimination of this species upon Hawaii's ecosystem is unknown. With regard to the loss of species resulting from exotic introduction, Kelvin Taketa, the Nature Conservancy vice president who directs the organization's Hawaiian program, aptly stated, "you just don't know if you have pulled the thread that unravels the tapestry."

II. EXISTING APPLICABLE LAW

No single federal statute regulates all exotic species introductions into the United States. Indirect regulation of certain exotic species and their host vectors began at the turn of the century with the enactment of the Lacey Act. But it was not until the early 1990's that federal law expressly controlled specific types of introductions of

33. Ezzell, supra note 23, at 316.
34. Ezzell, supra note 23, at 316.
35. Ezzell, supra note 23, at 314. The snake is also an exotic to Guam and has eaten nearly every bird on the island. There are up to 6000 snakes per square mile on the island. Sy Montgomery, Guam's Silent Enemy, L.A. TIMES, Jan. 16, 1989, § 2, at 3.
36. Ezzell, supra note 23, at 315; Ian Anderson, Pests in the Post Threaten Crops in Hawaii, NEW SCIENTIST, Nov. 21, 1992, at 10, 10. Of the 2500 species of insects in Hawaii, roughly 600 were introduced by humans. Ezzell supra note 23, at 315.
37. Ezzell, supra note 23, at 315.
nonindigenous species with an awareness of the deleterious impacts of exotic immigrants on native ecosystems.  

A. Indirect Responses

1. Lacey Act. Although the original Lacey Act was enacted primarily for the agricultural industry, it did affect exotic introductions within the United States. The Act enlarged the powers of the Department of Agriculture to prohibit the transportation in interstate commerce of game killed in violation of local law. Section 2 of the Act prohibited the importation of "any foreign wild animal or bird" without a permit, including the importation of the mongoose, fruit bat, English sparrow, starling, and any other bird or animal prohibited by the Secretary of Agriculture in "the interest of agriculture or horticulture." Additionally, the Act declared it illegal to transport any dead animal that was prohibited under section 2, and required packages containing dead animals to be "plainly and clearly marked."

The language of the Act suggests that Congress' primary interest in exotics was their affect on the agricultural industry, rather than on the larger surrounding ecosystems. Indeed, Congress sought to remove native species which threatened agriculture. Lacking modern knowledge regarding ecology and exotics, it is not surprising that the original Lacey Act was unconcerned with impacts on native ecosystems which were unrelated to agriculture.

In 1981, Congress broadened the Lacey Act to combat the illegal trade of fish and wildlife and their parts and products. The new amendments imposed stiffer civil and criminal penalties for the import, export, transport, sale, or purchase of fish, wildlife, or plants in violation of United States or Tribal Law. However, the new amendments still fell short of significantly affecting the introduction of exotic species.

40. Beginning with the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, infra note 78.
41. 31 Stat. 187.
42. 31 Stat. 187, 188 § 2.
43. 31 Stat. 187, 188 §§ 3-5.
44. 31 Stat. 187.
46. 16 U.S.C.A. § 3373(a)(1), (d)(1) (1988) (assessing maximum civil fine of $10,000 for failure to exercise due care and criminal penalties up to $20,000 and five years in prison for knowing violations).
The changes to the Lacey Act fell short for two reasons. First, the regulations employ the "dirty list" method to designate harmful species that may not be imported, whereby the Lacey Act instructs the Secretary to list as prohibited only those species demonstrated to be "injurious." The "clean list" method, whereby the Secretary lists only acceptable species which can be imported, would be far better at preventing exotics from damaging non-native ecosystems. The advantage of the "clean list" method is that the burden is placed on the possessor/transporter of the species to show that any unlisted species is not injurious. In contrast, the "dirty list" method adopted by the Secretary places the burden on the Secretary to show that a species is harmful when it is not on the list. However, often the harm is not known until after the species is introduced, when it is too late.

Although the "clean list" burden of demonstrating a species to be innoxious may appear too demanding, a reasonable standard which balances the value of minimizing adverse impacts on native ecosystems and the proposed benefit of the introduction could be used. The ultimate benefit of the "clean list" approach is not necessarily to make it more difficult to introduce exotic species, although greater difficulty would result if a high standard was adopted, but rather to place the duty of identifying undesirable introductions on the affected parties. In comparison to federal bureaucrats, these parties have an incentive to act more swiftly to demonstrate that the balance weighs

47. 18 U.S.C.A. § 42 (1988). The Lacey Act makes it unlawful to import or possess the zebra mussel or brown tree snake, as well as any other species of mammal, bird, fish, amphibian, or reptile which the Secretary of the Interior deems to be "injurious." Id. § 42(a)(1). "Injurious" is not specifically defined. Instead, section 42(a)(1) states, "[the importation of species] which the Secretary of Interior may prescribe by regulation to be injurious to human beings, to the interests of agriculture, horticulture, forestry, or to wildlife or the wildlife resources of the United States, is hereby prohibited." Id. Apparently, the exotic need only have a minimal negative impact for the Secretary to prohibit its introduction.


49. Laycock, supra note 48, at 23.

50. Laycock, supra note 48, at 23.

in favor of certain exotic introductions. Furthermore, a “clean list” approach would result in transporters who are sufficiently familiar with an exotic such that they may anticipate some negative impacts upon native species.

The second major inadequacy of the Lacey Act is that it only applies to intentional introductions, or introductions where the person did not exercise due care in knowing that prohibited fish or wildlife were being transported. Consequently, the Act fails to encourage people or businesses to use extra caution to prevent non-negligent, unintentional introductions of exotic species.

2. Endangered Species Act. The Endangered Species Act (ESA) indirectly affects exotic species introductions by protecting threatened and endangered species and their habitats. The purpose of the ESA is to “provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.” Section 9 of the ESA prohibits the “taking” of a threatened or endangered species within the United States. The ESA’s definition of “take” includes “harm,” which is defined by the Secretary of the Interior as “an act which actually kills or injures wildlife . . . or involves significant habitat modification or degradation where [the action] actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.” Since exotics alter behavioral patterns (like feeding) of native species, their introduction could be considered harmful to threatened or endangered species within the meaning of the ESA.

The Ninth Circuit has dealt with the issue of whether injurious effects by exotic species are considered “takings” under the ESA. In Palila v. Hawaii Dept. of Land & Natural Resources, the court of appeals found that non-native feral goats and sheep maintained by the State in the endangered Palila’s habitat (the mamane-naio forest in

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55. ESA, 16 U.S.C. § 1538(a)(1)(B). Section 11 assesses civil penalties of up to $25,000 for knowing violations or criminal penalties of up to $50,000 and one year in prison for knowing violations. Id. § 1540.
56. Id. § 1532(19).
57. 50 C.F.R. § 17.3(e) (1993).
Hawaii) had "a destructive impact on the mamane-naio ecosystem... [by feeding on] mamane leaves, stems, seedlings, and sprouts." Consequently, the Ninth Circuit affirmed the lower court's finding of a taking and ordered the goats and sheep in the Palila's habitat removed.

Seven years later, after the Secretary of the Interior promulgated the definition of "harm," the Ninth Circuit was confronted again with the issue of destruction of the Palila's habitat by an exotic species. However, this time the Sierra Club sought the removal of mouflon sheep, introduced by the Department of the Interior in the 1960's for the enjoyment of sport hunters. Like the goats and sheep in the first two Palila cases, the mouflon sheep also fed on the mamane trees. The Ninth Circuit upheld the district court's finding that the Secretary's definition of "harm" included habitat modification that could potentially result in the palila's extinction. Accordingly, the Ninth Circuit affirmed the district court's order to remove the mouflon sheep. Consequently, the Sierra Club's victory provides an example of how the ESA may combat habitat and ecosystem degradation by an exotic species where a listed species is potentially threatened.

The Palila cases suggest how the ESA can provide a cause of action for individuals to enjoin the introduction, and enforce the

59. Id. at 496.
60. Id. at 498.
61. Palila v. Hawaii Dep't of Land & Nat. Resources, 852 F.2d 1106 (9th Cir. 1988).
62. Id. at 1107.
63. Id. at 1108-09.
64. Id. at 1110.
66. Unfortunately, the Ninth Circuit's interpretation of "harm" under the ESA regulations has not been universally accepted. Recently, the District of Columbia Circuit by a two-to-one panel reversed its own prior decision and invalidated the regulation defining "harm" to include habitat modification. Sweet Home Chapter of Communities for a Great Or. v. Babbitt, 17 F.3d 1463, 1465-66 (D.C. Cir. 1994), modifying 1 F.3d 1 (D.C.Cir. 1993), reh'g denied., 30 F.3d 190 (D.C.Cir. 1994), cert. granted, 115 S. Ct. 714 (1995). The court explained that "harm" must be given a meaning consistent with the accompanying words in the statute. The statute defines a "take" to include activities that "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect' the listed species." 17 F.3d at 1465 (quoting ESA, 16 U.S.C. § 1532(19) (1988)). Therefore, the court concluded that "the nine verbs accompanying 'harm' all involve a substantially direct application of force, which the Service's concept of forbidden habitat modification altogether lacks." Id. However, the validity of this holding remains uncertain because the United States Supreme Court granted certiorari on January 6, 1995. 115 S.Ct. 714.
67. ESA, 16 U.S.C. § 1540(g) (1988). The citizen suit provision of the ESA allows any person to commence a civil suit of his or her own behalf to enjoin any person who is in violation
removal, of exotic species where the habitat of a threatened or endangered species is being significantly damaged. But this cause of action is quite limited because the Act applies only when the exotics either jeopardize ecosystems that house endangered or threatened species, or prey on the endangered species themselves. However, the ESA does not preempt suits to enforce rights under other statutes or common law.

B. Direct Administrative Response — Executive Order 11,987

The first administrative attempt to limit exotic introductions was adopted by President Carter in 1977 through Executive Order 11,987. The Order directed executive agencies to limit the introduction of “exotic species” into natural ecosystems on lands and waters owned or held by the federal government. Furthermore, the Secretary of the Interior was instructed to promulgate rules to effectuate the goals of the Order and to designate specific exotic species which would not have an adverse impact on native ecosystems. However, the Order was little more than an empty promise because the authorized guidelines were neither finalized nor implemented. Consequently, Executive Order 11,987 never played a role in the legal battle against exotic pollution.

C. Direct Legislative Responses

Recently, Congress recognized that the exotic species problem deserved its unabated attention. Accordingly, Congress enacted the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 and, more recently, the Alien Species Prevention and Enforcement Act of 1992. These Acts directly confront the exotic

of the Act. *Id.* § 1540(g)(1)(A). However, the Supreme Court recently held that persons suing under the ESA must establish the minimum requirements of constitutional standing: injury-in-fact, causation, and redressibility. *Lujan v. Defenders of Wildlife*, 112 S. Ct. 2130 (1992).

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69. *Id.* § 1(c).

70. *Id.* § 2(a).

71. *Id.* § 3.


species problem by attempting to prevent exotic introductions and provide federal funding to study the problem.

1. *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990.* In 1990, Congress acknowledged that the Great Lakes ecosystem was being uncontrollably altered by the infestation of zebra mussels.\(^7\) In response, Congress passed the Nonindigenous Aquatic Nuisance Prevention and Control Act.\(^6\) Although the Act was primarily adopted as a reaction to zebra mussel infestation, its provisions were designed to address unintentional introductions of all nonindigenous aquatic species.\(^7\) The Act requires all vessels to either exchange ballast water far enough from the “waters of the United States” in order to eliminate the spread of “aquatic nuisance species,” or use an “environmentally sound alternative” approved by the Secretary.\(^7\) The Act also assesses civil penalties of up to $25,000 for each day of violation and a criminal penalty of a class C felony.\(^7\)

Finally, the Act created a Task Force\(^8\) to develop a program, based on biological studies, to combat the introduction of exotic species.\(^8\) In 1993, the Coast Guard adopted guidelines which require either the discharge of ballast water in the Exclusive Economic Zone (EEZ)\(^8\)

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75. S. REP. No. 523, 101st Cong., 2d Sess. 2 (1990), *reprinted in* 1990 U.S.C.C.A.N. 6455, 6456 [Hereinafter S. REP. No. 523]. Although Congress noted the adverse impacts on the native ecosystem, its first stated concern involved the economic losses estimated at reaching $5 billion dollars by the year 2000. *Id.* Without the huge economic losses at stake, it seems unlikely that Congress would have responded so swiftly to the zebra mussel infestation.

76. NANPCA, supra note 73.


78. NANPCA, 16 U.S.C. § 4711(b)(2)(B) (West Supp. 1992). The term “aquatic nuisance species” is defined as “nonindigenous species that threaten the diversity or abundance of native species or the ecological stability of infested waters. . . .” *Id.* § 4702(2). The term “nonindigenous species” is defined as “any species or other viable biological material that enters an ecosystem beyond its historic range, including any such organism transferred from one country into another.” *Id.* § 4702(9). An “environmentally sound” alternative includes “methods . . . that minimize adverse impacts to the structure and function of an ecosystem. . . .” *Id.* § 4702(7).

79. NANPCA, 16 U.S.C. § 4711(c),(d).

80. NANPCA, 16 U.S.C. § 4721(b). The Task Force is comprised of the Director of the U.S. Fish and Wildlife Service, the Under Secretary of Commerce for Oceans and Atmosphere, the Administrator of the Environmental Protection Agency, the Commandant of the U.S. Coast Guard, the Assistant Secretary of the Army, and any other federal agency head designated by the Director of U.S.F.W.S. and the Under Secretary of Commerce for Oceans and Atmosphere. *Id.*


in water at least 2000 meters deep, the retention of ballast water on board the vessel, or any other method approved by the Commandant of the Coast Guard.  

However, the Act is an inadequate Congressional response for at least two reasons. First, the Act is restricted to aquatic nuisances (except for the brown tree snake), though equally significant threats to terrestrial ecosystems also exist. Second, the Act lacks a citizen-suit provision and, thus, is enforced solely through executive agencies. Consequently, citizens or organizations who use the affected ecosystems have no recourse within the statute to protect their ecosystems or receive remedies for ecological destruction.

Nevertheless, this legislation suggests that Congress has started to recognize the looming threat to native ecosystems from unintentional exotic introductions. Furthermore, the Act directs the Task Force to both discover how aquatic nuisance species are introduced and disseminate information regarding its findings. These findings should prove helpful in future legislation concerning this problem. Therefore, while not a comprehensive solution, the Nonindigenous Aquatic Nuisance Prevention and Control Act accomplishes much as an initial attempt at dealing with the exotic threat.

2. Alien Species Prevention and Enforcement Act of 1992. Most recently, Congress has focused on the detrimental effect of exotic species in the Hawaiian Islands by passing the Alien Species Prevention and Enforcement Act of 1992. The Act prohibits the mailing of exotic plants and animals, and is implemented by allowing the inspection of Hawaiian-bound mail suspected of containing exotic species. While this is but a modest attempt at

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The EEZ extends from the base line of the territorial sea of the United States seaward to a distance of 200 miles.  


84. The Act also directs the Task Force to develop a program to control the brown tree snake in Guam. NANPCA, 16 U.S.C. § 4728.


87. Id. § 3015(a). The animals regulated by the Act are referred to as “injurious animals,” defined as those animals “the importation or shipment of which is prohibited [by the Lacey Act]. . . .” Id. These animals are listed in the “dirty list” regulations, which designate the prohibited species under the Lacey Act. See 50 C.F.R. § 16 (1993).

resolving the Hawaiian problem, the Act also contains a beneficial assessment aspect. Specifically, a section of the Act directs the Secretary of Agriculture, in cooperation with the Secretary of the Interior, Postal Service, and State of Hawaii, to determine the extent and means of exotic species introductions. The results of this assessment will be reported to Congress.

The Act's impact upon the intentional introduction of exotic species into Hawaii has yet to be realized. Despite its limited application, if the Act proves effective in Hawaii, it could stimulate related legislation for nationwide mail service. Unfortunately, the success of the Act will probably be limited as it uses the flawed "dirty list" approach from the Lacey Act for designating "injurious animals."

Nevertheless, like the Nonindigenous Aquatic Nuisance and Prevention Act, the Alien Species Prevention and Enforcement Act illustrates the growing concern over exotic invasions. Moreover, the Act is beneficial because it will generate information as to how exotic species immigrate to Hawaii. Hopefully, the legislative wheel has merely begun to roll, and the increasing publicity of exotic-caused environmental damage will accelerate the legislative process.

D. The Failings of Statutory Approaches

This federal statutory system is riddled with cavernous holes in its application to exotic introductions. All the statutes discussed above seek to prohibit activities involving exotic species by enjoining the activity and imposing civil or criminal penalties on the violator, but only the ESA allows citizen enforcement. Furthermore, the above-referenced statutes coerce conduct by either commanding a course of action or imposing penalties, or both, rather than imposing a liability scheme on parties responsible for harmful exotic introductions. Command and control regulation may be effective in some kinds of exotic interference situations, but a liability system will be more effective in others.

There are three types of exotic interferences with native ecosystems. One interference is the intentional introduction of exotic species, such as the introduction of the carp into U.S. rivers by the United States Fish Commission. Another is the intentional

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90. *Id.*
importation of captive exotics that accidently escape into the ecosystem. These include, for example, pets that are brought into an area and are later released or escape. Finally, interference is caused when exotic species are unintentionally introduced in connection with the operation and ownership of property. For instance, transporting activity carried the zebra mussel in the ballast water of ships, insects in crates of fruit, and the brown tree snake in wheel wells of airplanes.92

Intentional introductions can be effectively regulated by statutes which directly influence decisions to introduce exotics. The Lacey Act, which prohibits the importation of listed species, is one such statute.93 By imposing civil and criminal penalties for importing listed plants and animals, the Lacey Act directly influences people’s behavior and encourages them to refrain from knowingly importing prohibited species.94

Similarly, exotics intentionally imported for the use and enjoyment of people, and accidentally introduced into the native ecosystem by private individuals, are also more effectively controlled by regulation than by public nuisance liability.95 There are two reasons for this. First, private accidental introductions of pets are often, individually, too minor and unnoticeable to effectively expose the owners to public nuisance suits. Secondly, case law suggests that the pet industry, as an importer, could not be held liable for causing a public nuisance because of the acts of its customers.96 Therefore, to limit accidental introductions derived from individual purchases of imports, the appropriate remedy is proper regulation of importing and application of the Lacey Act.

92. Supra notes 14, 35, and 36, and accompanying text.
93. Supra notes 41-43 and accompanying text. Recall that the effectiveness of the Lacey Act in preventing introductions of new species is highly questionable due to its use of the “dirty list” approach. Supra notes 47-50 and accompanying text.
95. However, public nuisance liability may provide extra protection against exotic introductions in cases like Colorado Div. of Wildlife v. Cox, 843 P.2d 662 (Colo. App. 1992). See infra note 153-158 and accompanying text.
96. See, e.g., City of Bloomington v. Westinghouse Elec., 891 F.2d 611, 614 (7th Cir. 1989) (finding PCB manufacturer not liable for public nuisance because manufacturer did not retain right to control PCB’s beyond point of sale); Quinnett v. Newman, 568 A.2d 786, 789 (Conn. 1990) (finding vendor not liable for public nuisance for serving liquor to person who later operated a motor vehicle).
However, statutes like the Lacey Act may provide an inadequate result (or no result since there is no citizen suit provision). Public nuisance law may be used as a supplement to these statutes in order to abate interferences with public domain ecosystems caused by intentional introductions that result in an accidental release. For example, in 1990, the City of Torrance, California sued Mobil Oil to require it to update its pollution controls. An attorney for the city stated that the nuisance action was its only recourse because "regulatory agencies can't levy fines big enough to get Mobil to stop." Therefore, where Congress fails to provide an adequate remedy, common law may fill in the gaps by granting relief when interferences with public rights become unreasonable.

Public nuisance liability provides the best solution to prevent totally unintentional introductions. Public nuisance liability is most effectively applied as a primary means of control where the exotic introduction unintentionally emanates from the use and ownership of property. But citizens could seek redress for the destruction of their ecosystems by applying tort law to both intentional and unintentional exotic introductions.

III. BENEFITS OF TORT SCHEME BASED ON NUISANCE LAW

Instead of piecemeal, narrow legislation, a modified tort system could provide incentives for exotic-introducing parties to take more protective measures to prevent themselves from becoming the vectors of transport, or prevent the escape, of exotic species during intentional introductions. The common law of public nuisance could be the heart of such a system. Although one federal statute discussed earlier has listed guidelines for avoiding unintentional introductions, with corollary penalties, tort liability would be more effective in

97. Not all intentional introductions allowed by the Lacey Act will threaten the public interest sufficiently to outweigh the value of the conduct. For instance, where the intentional introduction is performed with significant scientific basis for a proper public purpose, its value may outweigh its negative effects, and therefore no unreasonable interference is created. Moreover, the value of the conduct may be substantially increased where the action furthers a significant public purpose with reasonable scientific certainty, such as the application of exotic biological pesticides to control the gypsy moth. LeAnn Spencer, State Deploys Bacteria in War Against Gypsy Moth, CHI. TRIB., June 8, 1993, § 2, at 2. (noting that damage from exotic bacteria minimized by deploying bacteria before native butterfly season begins).


99. Id.

100. See NANPCA, supra note 76 and accompanying text.
preventing unintentional introductions of exotic species for several reasons.

First, a liability scheme would encourage transporters themselves to use their individual expertise to develop methods which are the most cost effective in preventing unintentional introductions. This would replace the existing system whereby transporters rely on the government to impose command and control regulations. A liability scheme is advantageous because no single blanket regulation can be ideal for every business. Congress has neither the time nor the expertise to fashion appropriate regulations for all transporting businesses. Therefore, a liability scheme should allow all transporters to use their own expertise to tailor the best preventative measures for their operations.

Second, a liability scheme would provide flexibility for a business to change methods if a more effective procedure becomes available. In contrast, federal regulations command a course of conduct which remains unchanged until the law is reformed. A liability scheme will produce changes much more quickly than the government bureaucracy. Therefore, the rigidity of the command and control statutes would be overcome with a liability scheme. The legislative process and enactment of successive regulations merely prolongs the inadequacy of existing preventative mechanisms.

Third, by encouraging innovative solutions to the emerging exotic invasion, a wealth of new information will be discovered regarding effective methods to cope with exotics. This knowledge can be shared and improved upon by companies that have an incentive to avoid environmental liability. Therefore, "[t]he effect of ... liability-based statutes is to assign much of the responsibility for planning for a dangerous and uncertain environmental future to that segment of society most capable of finding innovative solutions: the private sector." Unlike businesses, which strive to minimize costs, the government is too cumbersome and lacks the incentives to devise novel, preventative measures. Furthermore, expecting businesses to protect themselves from becoming vectors of transport is not

102. Id. at 761-62 (discussing inability of government to keep up with risks involved in new industry developments so that proper regulations can be devised).
103. Id. at 755-58.
104. Id. at 735.
unreasonable since science enables us to discover how exotics are transported, their effect within ecosystems, and the inventory of native species in different ecosystems.

A liability scheme for private suits should be premised on strict liability, rather than the fault-based liability in which private citizens pursue abatement injunctions. Strict liability is employed in nuisance suits by official public representatives.\textsuperscript{5} Strict liability would augment the incentives for transporters to avoid causing destructive exotic introductions by raising the standard of conduct required to avoid liability. In effect, strict liability demands whatever is necessary to prevent exotic invasion.

Sometimes the degree of care necessary to avoid causing an interference with the public's ecosystems may be too costly, or even impossible, to achieve. However, court enforcement of public nuisance law provides the necessary flexibility to adequately respond to these problems by balancing at two levels: first, when finding public nuisance liability, and second, when fashioning an equitable remedy like an injunction.\textsuperscript{105} The court balances the utility of the conduct with the gravity of the threat or harm to determine whether there is an unreasonable interference which establishes liability. Next, if liability exists, and if the legislature has not designated the appropriate remedy, the court will balance the equities to determine the proper scope of the injunction.\textsuperscript{107} Therefore, public nuisance law and the equitable discretion that accompanies it provides a doctrine which is adaptable to varying circumstances.

This adaptability of public nuisance law to many types of situations enables the law to be much less rigid than statutory regulations. Unlike public nuisance law regulatory statutes are limited in their ability to adjust to changed conditions. Change occurs through either amendments pursuant to the legislative process or, less radically, through agency or judicial interpretations. Therefore, common law public nuisance law provides the desired remedy of abatement, without the quagmire of legislation or the obsolescence of

\textsuperscript{105} See infra note 130 and accompanying text.
\textsuperscript{106} \textit{William H. Rodgers, Handbook on Environmental Law} § 2.6 (1977).
\textsuperscript{107} In State v. Davidson Industries, Inc., 635 P.2d 630, 637 (Or. 1981), defendant was found liable for a public nuisance for dumping fill into state waters without a permit. The court held that, where the legislature does not clearly restrict the duty of a court of equity, "the usual rules of equity would apply and . . . the court [would have] the power to balance the equities." \textit{Id.} Consequently, the court ordered that defendants employ a more cost-effective remedy than the removal of all fill. \textit{Id.} at 638.
static regulations. Public nuisance may serve as either a supplement to statutory regulations for intentional introductions or as the primary tool for unintentional introductions of exotic species, perhaps the most formidable environmental pollutant not adequately addressed in the law to date.

A. Environmental Protection Through Nuisance Law

Because it is adaptable to unusual situations and encompasses actions which have effects on the public at large, nuisance law is particularly useful in resolving environmental problems. As one commentator wrote,

> [t]he deepest doctrinal roots of modern environmental law are found in the principles of nuisance . . . . Nuisance actions have challenged virtually every major industrial and municipal activity which is today the subject of comprehensive environmental regulation . . . . Nuisance theory and case law is the common law backbone of modern environmental and energy law.¹⁰⁸

However, the development of complex environmental statutes evidences an apparent, or at least perceived, inadequacy of the common law to cope with emerging environmental problems.¹⁰⁹

While nuisance law may not be superior to environmental law under all circumstances, nuisance law is more flexible. This flexibility can plug any holes a statute leaves open when confronting the ecosystem damage caused by exotic species. Recognizing this, Congress has occasionally codified within statutes the principles of public nuisance law.¹¹⁰

Public nuisance law may be employed when pollution unreasonably interferes with the environment. For example, in *Georgia v.*
Tennessee Copper Co., the State of Georgia successfully sued ore-smelting companies that emitted sulfur gases which destroyed vegetation. On the initial consideration, the United States Supreme Court stated that

it is a fair and reasonable demand on the part of the sovereign that the air over its territory should not be polluted on a great scale by sulphurous acid gas, that the forests on its mountains, be they better or worse, and whatever domestic destruction they have suffered, should not be further destroyed or threatened by the act of persons beyond its control. . . .

Public nuisance suits can also be used to remedy past polluting conduct that continues to unreasonably affect the public at large. For instance, the California Court of Appeals recently allowed a public nuisance suit to be brought by a present property owner against the former owners, two oil companies, that had operated a natural gas processing plant on the property and allegedly contaminated the land between 1950 and 1970. Because "the pollutants continue to move through the soil and into the ground water causing new damage each day," the court held that the plaintiff had stated a cause of action based on public nuisance.

B. The Elements of a Public Nuisance

An actionable public nuisance is created by an unreasonable and substantial non-trespassory interference with a public right, which traditionally includes public health, safety, comfort, or convenience. Under common law, the reasonableness of an interfer-

113. Tennessee Copper I, 206 U.S. at 238.
115. Id. at 380.
116. Id. at 381-83, 388 (noting defendants may also be liable for nuisance per se as three California statutes prohibited water pollution through treatment or discharge of waste).
117. The Restatement uses "public right" and "public interest" interchangeably. See e.g., RESTATEMENT (SECOND) OF TORTS § 821B cmts. a, b (1977).
118. RESTATEMENT (SECOND) OF TORTS § 821B (1977); see also Village of Wilsonville v. SCA Services, Inc. 426 N.E.2d 824 (Ill. 1981) ("If the nuisance affects a place where the public has a legal right to go, and where members frequently congregate, or where they are likely to come within its influence, it is a public nuisance.")
ence is determined according to relative concepts like "gravity of harm" and "utility" of conduct which change between places and over time. In contrast to a public nuisance, "a private nuisance is one that affects a single individual or a definite number of persons in the enjoyment of some private right which is not common to the public." However, public and private nuisances are not mutually exclusive and may occur simultaneously.

Historically, only public officials were allowed to bring a public nuisance suit because public nuisances were criminal matters. Nevertheless, current law permits an individual to maintain a public nuisance action if he or she can show "special injury, different in kind from that suffered by the general public." This concept has also been referred to as "standing." Absent a special injury, only public representatives may maintain a public nuisance suit.

Public nuisances define the effect of an activity rather than the activity itself. As stated by the Supreme Court of Connecticut, "the term nuisance refers to the condition that exists and not the act that creates it." If the condition created by the action unreasonably and substantially interferes with a public right, the condition is a public nuisance.

120. See, e.g., Ozark Poultry Products v. Garman, 472 S.W.2d 714 (Ark. 1971) (permitting landowners' suit for public and private nuisance against factory that polluted air and water because activity invaded both public and private interests).
124. See, e.g., Frady, 637 P.2d at 1348 ("An action against the perpetrator of a public nuisance can be brought only by the state, unless an individual can show special injury, different in kind from that suffered by the general public.").
125. See Wood v. Picillo, 443 A.2d 1244, 1247 (R.I. 1982) ("The essential element of an actionable nuisance is that persons have suffered harm or are threatened with injuries they ought not have to bear... liability in nuisance is predicated upon unreasonable injury rather than upon unreasonable conduct.").
1. Reasonableness Test Allows Flexibility. Unreasonable interference with a public right is an elastic concept which changes over time. The balancing test suggested by the Restatement permits consideration of changing values, by stating that an unreasonable invasion exists if "the gravity of the harm outweighs the utility of the actor's conduct . . ." As society's values shift, such as from promoting a strong national defense to environmental cleanliness, formerly accepted practices which damage goals important to present-day society will more likely become prohibited as public nuisances. Therefore, public nuisance law is capable of adapting and progressing with evolving societal values, rather than fading into obsolescence.

2. The Standard of Fault Under Nuisance Law. Though damage to a public resource may clearly evidence the prima facie case for a public nuisance, there is considerable confusion regarding the importance of the fault of the actor in assigning liability. In contrast to private nuisances, as discussed below, fault is not a prerequisite of liability for a public nuisance action brought by the sovereign. Where a public nuisance is found and the plaintiff is the sovereign, or an official representative of the public, the court never considers the fault of the actor, but rather invokes strict liability for damage caused. This view follows from the origin of public nuisances, which treated nuisances as crimes at common law that were controllable by the

127. See State v. Quality Egg Farm, Inc., 311 N.W.2d 650, 655 (Wis. 1981) ("What may be a nuisance in one location may not be one elsewhere . . . those which in their nature are not nuisances [] may become so by reason of the locality, surroundings or the manner in which they may be conducted or managed.").

128. RESTATEMENT (SECOND) OF TORTS § 826(a) (1977). This rule was formulated specifically for private nuisances. However, the drafters explain that "a similar rule may, and commonly does, apply to conduct that results in a public nuisance." Id. at cmt. a.

The Restatement provides the following factors to determine if the gravity of the interference with the public right outweighs the utility of the actor's conduct: (1) the extent and character of the interference, (2) the social value that the law attaches to it, (3) the character of the locality involved, and (4) the burden placed on the members of the public. Id. at § 827.

129. See Armory Park, 712 P.2d at 921 ("What might amount to a serious nuisance in one locality by reason of the density of the population, or character of the neighborhood affected, may in another place and under different surroundings be deemed proper and unobjectionable. What amounts [to] . . . a nuisance . . . cannot be precisely defined.") (quoting Macdonald v. Perry, 255 P. 494, 497 (Ariz. 1927)).

state's police power to protect the public. Though public nuisances are no longer limited to crimes, they continue to be treated as unreasonable violations of the public welfare. As such, they are abated in favor of the sovereign's police power regardless of the degree of care exercised by the actor. Rather than focusing on the mental state of the actor, courts focus on the effects of the conduct and employ strict liability when the sovereign exercises its police power to control public interferences found to be unreasonable.

Though strict liability may seem harsh, it is imposed only where there are serious interferences with a public interest. Strict liability works well by providing a powerful incentive for property owners to be aware of conditions emanating from their property which interfere with the public. Critics argue that this liability cannot conform future conduct of a landowner who acts with all due care but is still unaware of the condition causing the nuisance. The response is that due care is not necessarily a high standard and strict liability encourages owners of property to exercise more than mere due care to discover and remedy conditions which could impose serious consequences upon the public. The following cases illustrate the absolute nature of strict liability.

133. Starr v. Commissioner of Envtl. Protection, 627 A.2d 1296, 1315 (Conn. 1993) (“Because a public nuisance implicates the rights of the public and the exercise of the state’s police power, the legislature could legitimately determine that the plaintiff’s lack of culpability for the existence of the contaminated condition is outweighed by the state’s interest in protecting public resources.”).
134. See, e.g., National Wood Preservers, Inc. v. Department of Envtl. Resources, 414 A.2d 37 (Pa. 1980) (“The notion of fault is least functional, however, when balancing the interests of a property holder against the interests of a state in the exercise of its police power, because the beneficiary is not an individual but the community.”).

Unlike public nuisances, private nuisances require fault; thus, an actor is liable only if the nuisance arose out of his negligent, abnormally dangerous, or intentional act. RESTATEMENT (SECOND) OF TORTS § 822. See, e.g., Hall v. Phillips, 436 N.W.2d 139, 145 (1989), where the court noted that “one may be subject to liability for tortious private nuisance . . . if the invasion is intentional and unreasonable or otherwise actionable under rules controlling liability for negligence or liability for abnormally dangerous conditions or activities.” Id. at 143. Though plaintiff did not allege negligence or abnormally dangerous conduct, the court reversed a summary judgment to determine whether defendant’s application of herbicide which blew onto plaintiff’s bean crop was an intentional invasion. Id. at 140-142, 146.
In *New York v. Shore Realty*,\(^{136}\) the court noted that the defendant, as a landowner, "is subject to liability for either a public or private nuisance on its property upon learning of the nuisance and having a reasonable opportunity to abate it."\(^{137}\) However, in addition, the court wrote that the threat of a hazardous waste spill from deteriorating tanks maintained on defendant's land constituted a "public nuisance" for which defendant was liable "irrespective of negligence or fault."\(^{138}\) The court's analysis suggests that Shore was liable in two respects: first, Shore was negligently liable for a public and private nuisance because it knew that hazardous waste had been disposed on the property and failed to remedy the problem; second, regardless of Shore's knowledge or fault, it was strictly liable for public nuisances which emanated from the use of its property.\(^{139}\)

Likewise, the Pennsylvania Supreme Court in *Commonwealth v. Barnes & Tucker Co.*\(^{140}\) held the defendant liable for a public nuisance when his water-filled mine discharged acidified water into a stream. The court explained that "the absence of facts supporting concepts of negligence, foreseeability or unlawful conduct, is not in the least fatal to a finding of the existence of a common law public nuisance."\(^{141}\) The court emphasized that concern with defendant's fault is misplaced in public nuisance law because the proper inquiry focuses on the *result* of defendant's act, not the action itself.\(^{142}\)

Finally, in *State v. Hatfield*,\(^ {143}\) the Supreme Court of Nebraska enjoined the operation of the defendant's restaurant because it


\(^{137}\) Id. at 1050.

\(^{138}\) Id. at 1051.

\(^{139}\) Id. at 1050-51. Although the court muddles the distinction between public and private nuisance, its ultimate decision was correct. If a landowner is aware of a condition on his land which is causing a nuisance but fails to remedy the situation, the landowner acts negligently and is liable for either private nuisance, public nuisance, or both depending on the interests invaded. However, if a landowner is without fault and unaware of a condition on his land which causes substantial interference with a public interest, the landowner cannot avoid liability by remaining ignorant. Thus, he is strictly liable for abating the public nuisance. See Halper, *supra* note 130, at 10295 ("that which interferes with the rights of all must be abated when the public, through its appropriate representative, seeks its abatement.").


\(^{141}\) Id. at 883.

\(^{142}\) Id.; see also Tipler v. McKenzie Tank Lines, 547 So. 2d 438, 440 ( Ala. 1989) ("[Nuisance] may consist of activities that are conducted in an otherwise lawful and careful manner, as well as conduct that combines with the culpable act of another, so long as it works hurt, inconvenience, or damage to the complaining party").

\(^{143}\) State v. Hatfield, 158 N.W.2d 612 (Neb. 1968).
attracted "hoodlums, prostitutes, gamblers, and other disorderly persons and [was] a constant source of trouble for the police." Even though the defendant "attempted to maintain order in his establishment and ha[d] cooperated with the police," the court held that the restaurant constituted a public nuisance. Therefore, regardless of defendant's remedial efforts and lack of culpability, he was held strictly liable because his business caused an unreasonable interference with the public welfare which had to be abated.

As illustrated above, when the sovereign exercises its police power to safeguard the public interest from interferences which are deemed unreasonable by a legislature or court, the person who owns the property causing the interference is strictly liable. Consequently, the sovereign may protect public resources from degradation caused by pollution emanating from a person's property, regardless of the culpability of the owner.

C. Private Citizens as Plaintiffs for Public Nuisance Claims

Nuisance suits by private citizens are distinguishable from suits by the sovereign in two critical ways. First, to maintain a public nuisance suit, a private citizen must demonstrate that he or she suffers a "special injury"—one that is "different in kind from that suffered as a member of the public." Second, the citizen plaintiff has a greater burden in establishing defendant's liability than does the sovereign plaintiff.

1. Special Injury Requirement. Frady v. Portland General Electric Co. illustrates the special injury necessary for private citizens to support a public nuisance action. Landowners sued a nearby turbine facility alleging that their property suffered physical damage caused by low frequency sound waves emitted from the plant. Defendants claimed that plaintiffs merely alleged facts constituting a claim for a public nuisance (a public right to be free from excessive noise), but failed to allege a special injury necessary to maintain the suit. The court upheld plaintiffs' complaints and

144. Id. at 613.
145. Id. at 613-14.
147. Id.
148. Id.
149. Id. at 1348-49.
stated, "[w]hen a public nuisance interferes with an individual's right to use and enjoy his real property, the individual suffers special injury and may bring an action against the perpetrator of the nuisance."\(^\text{150}\)

Similarly, in *Leo v. General Electric Co.*,\(^\text{151}\) commercial fishermen were permitted to bring a public nuisance action against a polluter of the Hudson River. "[D]iminution or loss of livelihood is not suffered by every person who fishes in the Hudson River. . . . [However,] commercial fishermen do have standing to complain of the pollution of the waters from which they derive their living."\(^\text{152}\)

Therefore, private plaintiffs must suffer a personal or physical invasion, such as personal injury, injury to property, or other damage different from and in addition to the damage to the general public. This invasion must also be *in connection with* the invasion of a public interest (clean rivers, clean air, freedom from excessive noise).\(^\text{153}\) When these requirements are met, private plaintiffs may maintain a public nuisance suit.

However, the Supreme Court of Hawaii, in *Akau v. Olohana*,\(^\text{154}\) presented a different position which may evidence a trend away from the special injury rule, towards a more liberal "injury in fact" standard. Under this court's standard, an individual may sue to enforce public rights without showing an injury different in kind from the public's injury, provided that (1) plaintiff suffered an injury in fact and (2) a multiplicity of other similar suits would be avoided if the suit were allowed to continue.\(^\text{155}\) In *Akau*, plaintiffs sued defendants for barring beach access to the public along a two and a half mile stretch of property. Plaintiffs alleged that a trail leading to the beach

\(^{150}\) Id. at 1349.


\(^{152}\) Id. at 847; *see also* Burgess v. M/V Tamano, 370 F. Supp. 247, 250-51 (D. Me. 1973) (allowing commercial fisherman to maintain action for public nuisance when oil tanker polluted coastal waters, but rejecting businessmen's claims for lost customers because of polluted beaches), aff'd, 559 F.2d 1200 (1st Cir. 1977).

\(^{153}\) For one example, see Philadelphia Elec. Co. v. Hercules, Inc., 762 F.2d 303 (3rd Cir. 1985). The plaintiff brought a public nuisance suit for clean-up damages and injunctive relief against a tenant who polluted property and contaminated a river. *Id.* at 306-307. The court held that the plaintiff could not maintain a public nuisance action because, although its pecuniary harm was different in kind to the public's harm, the plaintiff did not suffer this harm from the interference of a public right, namely the right to pure water. The condition on the plaintiff's property was the cause of the harm, not the result of it. The plaintiff suffered harm in the exercise of a wholly private right. *Id.* at 316.

\(^{154}\) Akau v. Olohana, 652 P.2d 1130 (Haw. 1982).

\(^{155}\) Id. at 1134 (noting that avoidance of multiplicity of suits would likely entail a class action).
COMBATTING THE EXOTIC SPECIES INVASION

was a public right of way. The court held that obstruction of a right of way is a public nuisance. Moreover, the court determined that plaintiffs had standing to assert the public nuisance action because they suffered injury to their recreational interest in using and enjoying the beach. Therefore, the interference with a non-economic interest was sufficient to enable plaintiffs to fulfill the less strict "injury in fact" standard. Despite this trend, most courts adhere to the "different in kind" standard. However, in order to allow citizens to pursue public nuisance suits where a public nuisance occurs solely within the public domain, the more appropriate standard to apply is the "injury in fact" threshold.

2. Greater Burden of Establishing Liability. Private plaintiffs who assert public nuisance claims have more difficulty than sovereign plaintiffs in establishing liability because they do not act pursuant to the police power of the state. As a result, the fault-based requirements found in private nuisance suits also apply to public nuisance suits brought by private individuals. Without this rule, a plaintiff could shift the burden of proof and evade limits on recovery by artfully pleading a public nuisance, thus causing strict liability to attach. For instance, a plaintiff could receive damages for a tort which would otherwise be barred by his or her own contributory negligence by alleging a public nuisance instead of a private nuisance. To avoid this problem, private plaintiffs are required to

156. Id. at 1132.
157. Id. at 1133.
158. Id. at 1133-35 ("This court has been in step with the trend away from the special injury rule towards the view that a plaintiff, if injured, has standing. We concur in this trend because we believe it is unjust to deny members of the public the ability to enforce the public's rights when they are injured.").
159. Id. at 1135.
161. For further discussion regarding the appropriate standard to apply to citizens suing for the public nuisance of ecosystem damage caused by exotics, see infra notes 204-210 and accompanying text.
162. Halper, supra note 130, at 10297-98.
163. Halper, supra note 130, at 10298.
164. See McFarlane v. City of Niagara Falls, 160 N.E. 391, 391-92 (N.Y. 1928) (allowing contributory negligence defense when plaintiff tripped on raised edge of sidewalk, regardless of whether plaintiff claimed negligence or public nuisance as the "substance of the wrong is
establish liability according to the fault-based scheme applicable to private nuisances, regardless of whether they assert public or private nuisance claims.\textsuperscript{165}

The Connecticut Supreme Court has decided cases which exemplify the different treatment of public nuisance suits brought by private individuals.\textsuperscript{166} In \textit{Quinnett v. Newman},\textsuperscript{167} the plaintiff and defendant were both private citizens. The plaintiff alleged that the defendant, a liquor store owner, created a public nuisance by selling liquor to an intoxicated person who was operating a motor vehicle.\textsuperscript{168} The court rejected the plaintiff’s public nuisance claim against the liquor vendor on the grounds that the hazardous condition of an intoxicated person operating a car results from the motorist’s use of alcohol, not the vendor’s sale of the liquor.\textsuperscript{169} In so holding, the court explained that both public and private nuisances refer to the condition that exists, not the actions which created it.\textsuperscript{170} In both actions, the type of liability applied depends upon whether the defendant acted intentionally or unintentionally.\textsuperscript{171} This means that

\begin{quote}
[i]f the creator of the condition intends the act that brings about the condition found to be a nuisance, the nuisance \ldots is \ldots absolute and its creator is strictly liable. \ldots If the condition claimed to be a nuisance arises out of the creator’s unintentional but negligent act, \textit{i.e.,} a failure to exercise due care, the resulting condition is \ldots a negligent nuisance.\textsuperscript{172}
\end{quote}

Consequently, under private citizen public nuisance suits, an actor will be strictly liable for conditions caused by intentional acts but will only be liable for unintentional accidents if a duty of care was breached.

Not all jurisdictions agree with applying a fault-based scheme to public nuisance actions brought by private plaintiffs. For instance, in
Wood v. Picillo\textsuperscript{173} multiple private plaintiffs sued under public nuisance alleging that the defendants’ chemical dump site was polluting the soil of a marsh connected to a publicly owned river.\textsuperscript{174} The defendants claimed that the plaintiffs were required to prove negligence as an element of their nuisance case. The Rhode Island Supreme Court stated, “this court has not required plaintiffs to establish negligence in nuisance actions.”\textsuperscript{175} Furthermore, the court distinguished nuisance from negligence liability on the grounds that “liability in nuisance is predicated upon unreasonable injury rather than upon unreasonable conduct.”\textsuperscript{176} Since the defendants’ chemical dumping activities constituted a substantial threat to humans and aquatic wildlife, the court held the defendants strictly liable for creating both a public and private nuisance.\textsuperscript{177} Consequently, the importance of the actor’s fault differs among jurisdictions in private actions for public nuisance.

Since rules regarding the culpability of defendants in public nuisance suits differ depending on the jurisdiction and the character of the plaintiff, it is not surprising that public nuisance law has become muddled. Perhaps the best explanation is that nuisance law developed separately in each state and varies according to the values placed on certain activities. Nonetheless, in public nuisance suits by the sovereign and by private citizens, strict liability becomes most appropriate where a condition endangers a public resource like an ecosystem and the remedy requested is an injunction. When the private citizen seeks abatement and the court determines that the condition emanating from a defendant’s property is in fact an unreasonable interference with a public right, then strict liability should apply and abatement should be ordered. If a plaintiff seeks abatement of a bona fide public nuisance as determined by the fact-finder, the plaintiff who is not the sovereign should not be required to overcome a higher burden of proof. An argument against this

\textsuperscript{173} Wood v. Picillo, 443 A.2d 1244 (R.I. 1982).
\textsuperscript{174} Id. at 1245-47.
\textsuperscript{175} Id. at 1248.
\textsuperscript{176} Id. at 1247 (citing Braun v. Iannoti, 175 A. 656, 657 (R.I. 1934)). In Braun, the court held defendant liable for a nuisance caused by smoke and soot emitted from his furnace which invaded plaintiff’s house, regardless of whether the smokestack was negligently constructed. Braun, 175 A. at 657.
\textsuperscript{177} Wood, 433 A.2d at 1249. However, the court explained that strict liability could also rest upon use of land for abnormally dangerous activities without the presence of a nuisance or negligence. Nevertheless, the court’s finding of both public and private nuisance made it “unnecessary to consider the doctrine of strict liability.” Id. at n.7.
approach is that private plaintiffs have selfish interests, which are their primary motivation for bringing suit; thus, they do not appropriately represent the public interest. Regardless of the plaintiff's motivation, if the remedy sought is identical to the remedy a public representative would request (i.e. abatement), the plaintiff's personal interests do not conflict with the alleviation of an unreasonable public interference. Therefore, where an interference is a public nuisance, the public should not have to wait for the public representative to bring suit when a private plaintiff with standing could accomplish the same result more quickly. Consequently, strict liability should apply when public nuisance plaintiffs, private or sovereign, request abatement injunctions to prevent an unreasonable interference with substantial societal interests.

D. Remedies

Two remedies are available to an individual who can demonstrate an injury different in kind but connected to the damage suffered by the general public. First, such a plaintiff may recover damages for the injury sustained, such as diminution in market value of property, as well as for mental distress and annoyance caused by the nuisance. Second, the plaintiff may be granted an injunction against the defendant to abate the nuisance. Therefore, individual plaintiffs

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178. One commentator recognizes the “Catch-22” under the current majority rule for private plaintiffs who seek to maintain public nuisance suits. See Miles Tolbert, The Public as Plaintiff: Public Nuisance and Federal Citizens Suits in the Exxon Valdez Litigation, 14 HARV. ENVTL. L. REV. 511, 514-15 (1990) (“[B]y requiring that a plaintiff have injuries different in kind from the general public, however, the law creates a private attorney general whose interests are, by definition, divorced from those of the public whose rights he is to vindicate. . . . Thus, the common law as it has developed has trapped . . . all environmental groups seeking to vindicate public rights, into a Catch-22: the law does not allow them to bring those lawsuits which they are most competent to bring.”).

179. See discussion supra text and accompanying notes 132-134.


181. Armory Park v. Episcopal Community Serv., 712 P.2d 914, 918 (Ariz. 1985). See also Developments in the Law—Injunctions, 78 HARV. L. REV. 994, 996-98 (1965). Historically, Courts at Law preferred to award damages rather than allow the Chancery Courts to fashion equitable relief like injunctions. Id. at 997. Even today, after the merger of law and equity, courts will usually not grant equitable remedies unless legal ones cannot redress the injury. Id. at 998. Consequently, injunctions will be granted when damages are inadequate, such as with ongoing nuisances where a multiplicity of suits or an award of future damages would be required. Id. at 1001.
can recover damages for personal injuries sustained and be granted injunctions to halt the public nuisance.\textsuperscript{182}

Similar to the private plaintiff, a state suing for public nuisance may recover damages for injury to state property and get an injunction to abate the nuisance.\textsuperscript{183} For instance, in \textit{Lansco Inc. v. Department of Environmental Protection}\textsuperscript{184} the State of New Jersey was allowed to recover damages for the harm to its water resources caused by a 14,000 gallon oil spill.\textsuperscript{185} The court wrote, "[i]t has long been established that the sovereign's interest in the preservation of public resources and the environment enable it to maintain an action to prevent injury thereto . . . [and to] obtain damages for injury to public resources and the environment."\textsuperscript{186} Consequently, an action by the state is the only means by which damages to public resources can be recovered.

\section*{IV. Public Nuisance Law Applied To Exotic Species Introduction}

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. In many instances, exotic species can cause more severe damage to public land and water ecosystems than typical pollutants. Unlike a hazardous waste or oil spill which

\textsuperscript{182} Recall that the burden of proof usually differs between private plaintiffs and the sovereign. \textit{See supra} text accompanying note 146. However, I argue that where the private plaintiff seeks damages for himself he should be subject to the normal fault based liability scheme. But if plaintiff seeks an injunction which abates the unreasonable public interference, strict liability should apply. \textit{See supra} notes 173-179 and accompanying text.

\textsuperscript{183} \textit{See} Selma Pressure Treating Co. v. Osmose Wood Preserving, Inc., 271 Cal. Rptr. 596, 604 (Cal. Ct. App. 1990) ("[w]here the governmental unit owns or has a property interest which is injuriously affected by the nuisance, we perceive no reason why it should be barred from recovering money damages for injury done to that interest"); City of New York v. Taliaferrow, 551 N.Y.S.2d 253 (N.Y. App. Div. 1990) (affirming award of compensatory damages, punitive damages, civil penalty and injunction in favor of city where defendant operated property for prostitution). \textit{But see} Los Angeles v. Shpegel-Dimsey, Inc., 244 Cal.Rptr. 507, 510-11 (Cal. Ct. App. 1988) (denying city recovery for costs to abate fire caused by defendant, even though fire constituted public nuisance, because costs of public services are borne by public as a whole).


\textsuperscript{185} \textit{Id.} at 524 (citing Georgia v. Tennessee Copper Co., 206 U.S. 230 (1970)).

\textsuperscript{186} \textit{Id.} at 524 (noting that state may have fiduciary obligation to protect environment and seek compensation for "any diminution in that trust corpus.") (quoting State v. Jersey Central, 308 A.2d 671, 674 (N.J. Super. Ct. Law Div. 1973)).
involves a finite amount of pollution, exotic species can reproduce and multiply within an ecosystem. Their proliferation thus tears the tenuous threads of the food web through predation, competition for food and space, and habitat modification. Furthermore, the longer exotic species are allowed to establish themselves within an ecosystem, the harder it is to eradicate them later. As a result, exotic species are potentially more dangerous to ecosystems than any other human pollutant. Responsible parties should pay for the resulting environmental damage just as they would for other pollution discharges which contaminate public resources. From 1906 to 1991, seventy-nine exotic species introduced into the United States caused $97 billion in economic damage and incalculable amounts of non-economic damage.\footnote{OFFICE OF TECHNOLOGY ASSESSMENT REPORT BRIEF, 139 CONG. REC. H8476 (1993).}

Nevertheless, before public nuisance law can be applied to the hazards of exotic species, the following questions must be answered:

1) Is there a public right involved?
2) Is the interference with that right unreasonable?
   a) What is the gravity of harm to the public interest?
   b) What is the utility of the conduct lost if liability is found?
3) Has plaintiff suffered a harm different in kind, but connected to the interference suffered by the public generally?
4) Does plaintiff seek damages, an injunction, or both?

The answers to these questions may limit the application of public nuisance law. Moreover, it must be determined whether the nuisance was actually and proximately caused by exotics emanating from property used by defendant.\footnote{Discussed infra text accompanying notes 211-223.}

A. Public Right

Traditionally, land and water used and owned by the public have been encompassed by the public right to be free from pollution.\footnote{See Tennessee Copper I, 206 U.S. at 230 (regarding state's interest in its forests); see also Lansco, Inc. v. Department of Envtl. Protection, 350 A.2d 520 (N.J. Super. Ct. Ch. Div. 1975), and text accompanying notes 184-186 (discussing state's interest in its "public resources and the environment").}

Prior to 1992, however, no appellate court had reviewed the assertion that exotic-free ecosystems and biodiversity are public rights encompassed by public nuisance law. In \textit{Colorado Division of Wildlife v. Cox}, the Colorado Court of Appeals was presented with the question of whether the introduction of exotic species into the state's natural environment constituted a public nuisance. In their decision, the court applied the public nuisance doctrine to exotic species, thus recognizing the public interest in maintaining biodiversity and the environment. This decision set a precedent for similar cases and highlighted the growing awareness of the environmental impacts of exotic species introductions.
with a public nuisance suit brought by three state agencies against owners of an exotic wildlife ranch. These agencies included the Division of Wildlife, Department of Natural Resources, and the Colorado Wildlife Commission. The plaintiffs alleged that the defendants' possession of unpermitted, non-native animals, such as red deer, Barbary sheep, and ibex goats, was a public nuisance as defined by a Colorado statute. The pertinent part of the statute reads:

Domesticated or exotic wildlife which are illegally possessed or have escaped the owner's control and which are determined by the division to be detrimental to native wildlife, habitat or other wildlife resources by the threat of predation, the spread of disease, habitat competition, interbreeding with native wildlife, or other significant damage... [shall be considered] to be a public nuisance... [and defendants are liable] for damages to the state's wildlife resources under appropriate statutory and common law... The plaintiffs sought an injunction allowing them to remove the public nuisance at the defendants' expense. The defendants contended that their animals were not shown to be a public nuisance. However, the court responded, "[scientific evidence] on the impacts caused by red deer, Barbary sheep, and ibex goats, was more than sufficient to support the trial court's determination... that defendants' animals were 'detrimental to Colorado native wildlife.'" The abatement orders were subsequently upheld.

Colorado Division of Wildlife illustrates the emerging social attitudes and values regarding the quality of ecosystems. This case presents strong evidence that ecosystems free from destructive exotic organisms are within the public interest and deserve protection by the common law of public nuisance. Following from this, the maintenance of the health and quality of ecosystems and biodiversity within the public domain should also be acknowledged by courts as a public right. In particular, interference with the well-being of ecosystems and destruction of biodiversity within public lands should be dealt with under public nuisance law.

191. Id. at 663.
192. Id.
193. Id.
194. See id. at 663 (quoting Colorado Dep't of Nat. Resources Regulation 1107b, 2 COLO. CODE REGS. §§ 406-408 (1990)) (second emphasis added).
195. Id. at 663.
196. Id. at 664.
B. Unreasonable Interference

Assuming that destructive activities of exotic species interfere with a public right, the next determination is whether the interference is unreasonable. To ascertain the viability of using public nuisance as a control mechanism for unintentional introductions, it must first be determined whether the judicial public nuisance balance would weigh in favor of prohibiting unintentional introductions.\(^\text{197}\) If the nuisance is statutorily defined, as in Colorado, the legislature will have already tipped the scales in favor of public nuisance labelling.\(^\text{198}\) If the nuisance is not defined by statute, courts will then balance the gravity of harm to the public interest against the value of the conduct sought to be prohibited. If the harm to the public outweighs the value of the conduct, the conduct is deemed to be a public nuisance.\(^\text{199}\)

1. Gravity of Harm. The threat to the public interest caused by exotic species is evident. For example, in Hawaii nearly forty percent of all native bird species have become extinct, largely as a result of human introduction of exotics.\(^\text{200}\) Likewise, numerous transporting activities have introduced an unknown quantity and variety of exotics into water and terrestrial ecosystems.\(^\text{201}\) The proliferation of exotics within ecosystems may even trigger the collapse of entire biotic communities into monocultures.\(^\text{202}\) Therefore, introductions of exotics are jeopardizing the public's interest in maintaining biodiversity and the health of ecosystems.

2. Value of Conduct Impaired. Stow-away exotic species which are transported by importing activities (via ballast water or hidden...
among cargo) are troublesome because their introduction is unintentional. Furthermore, the importing activity which could be lost or impaired due to public nuisance liability is highly valued because it serves our human culture and way of life. Therefore, the harm/value balance may be nearly equal. If, for the sake of human conveniences, our ecosystems collapse, the resulting desire to protect biodiversity will come too late.

Depending on the severity of the existing or threatening interference, the potential for ecosystem damage or collapse may be great enough to outweigh the value of unprotected importing activity that has a low economic cost. It is important to note that public nuisance liability will not prohibit all importing activity. Instead, it will merely alter the behavior of importers so that they choose the course of action which allows them to avoid liability. Furthermore, potential liability will effectively prohibit activity which demonstrates a significant threat of introduction because the defendant risks being charged with the cost of abating the public nuisance. In some cases, the defendant may also be required to pay for damages sustained by public resources. Since society is increasingly valuing its ecosystems and biodiversity, the individual cost to guard against unintentional introduction of exotic species will likely be outweighed by the public's interest.

C. Plaintiff's Special Injury

Even if a defendant's conduct produces an unreasonable interference with a public right, individuals may not sue unless they can show an injury different in kind but connected to the interference suffered by the public. While the sovereign is not limited to showing special injury in order to bring a public nuisance suit, these constraints are imposed on citizens seeking the remedy of public nuisance as a response to exotic introduction. This presents a substantial legal hurdle since most of the ecosystems affected are within the public domain and unrelated to private ownership interests. For instance, courts have refused to allow individuals to maintain suits under public nuisance law where other forms of pollution did not affect them in

203. The term "unprotected importing" means transporting without precautions to prevent the introductions of exotic species.
204. See supra note 125 and accompanying text.
any manner different from the general public. While some people arguably are more concerned than others about the status of our ecosystems and biodiversity, individuals seldom suffer distinct recognizable injuries that can be distinguished from public suffering. This is because exotics usually only affect the public domain. Consequently, individuals are unlikely to successfully institute a public nuisance action for failure to show a special injury that is different in kind to their injury suffered as a member of the public. Some argue that this is the correct result because public nuisance suits should remain under exclusive authority of the sovereign rather than individuals motivated by self-interest.

However, this argument ignores the fact that individuals will not taint the purposes of public nuisance suits because the court will determine whether the invasion constitutes a public injury, regardless of the plaintiff's interest. Therefore, the individual plaintiff merely acts as a public representative providing the impetus for a court to examine the alleged public interference.

If a lower standard for maintaining public nuisance suits is adopted, as seen in Akau v. Olohana, perhaps public nuisance suits would be within the quiver of remedies accessible to citizens. Additionally, a federal or state statutory scheme, like that involved in Colorado Division of Wildlife v. Cox, could solve such deficiencies by (1) declaring the introduction of exotics a public nuisance and (2) providing a citizen suit provision similar to existing federal environmental statutes, which allows injunctions to be imposed against violators. Furthermore, the statute could mandate strict liability, like the legislation in Starr v. Commissioner of Environmental

205. See Rome City v. King, 450 N.E.2d 72 (Ind. Ct. App. 1983) (denying property owners' public nuisance action for noises and odors that interfered with their use and enjoyment of the land because noises and odors were equally suffered by the public).

206. See, e.g., Abrams & Washington, supra note 130, at 389.


208. Supra notes 191-97 and accompanying text.

209. See, e.g., Federal Water Pollution Control Act, 33 U.S.C.A. §§ 1251-1387 (1988). Section 1365 authorizes "any citizen" to sue to enforce the Act "against any person who is alleged to be in violation" of the Act and to receive both an injunction against the violator and civil penalties. Id. at § 1365. Of course, the citizen bringing suit must establish the constitutional elements of standing: concrete and imminent "injury in fact," "causal connection" between plaintiffs' alleged injury and defendant's conduct, and "likelihood" that a favorable decision will redress plaintiffs' injury. Lujan v. Defenders of Wildlife, 112 S. Ct. 2130, 2136 (1992). Notice that the federal standing threshold is equivalent to the requirement set by the Supreme Court of Hawaii in Akau, 652 P.2d at 1134-35.
Protection, so that the fault-based common law approach routinely applied in private citizen suits would be preempted. Provided the requirements of causation are established, a state statutory scheme incorporating public nuisance law principles would provide protection to native resources and facilitate citizens’ access to that protection.

D. Causation

There is perhaps no greater obstacle for plaintiffs in a public nuisance suit alleging exotic species damage than linking a defendant with the nuisance. The subject of causation is too large and complex to be treated in its entirety here. However, this Article briefly discusses some of the general principles in an effort to highlight the sizeable hurdle of actual and legal (proximate) causation, particularly in the area of exotic damage.

In addition to the elements of nuisance a plaintiff must show that defendant “caused” the unreasonable condition. In Armory Park v. Episcopal Community Services, the court held that a charity center caused a public nuisance to the surrounding community by attracting transients who invaded the plaintiff’s property when travelling to the center. The court explained that the charity center’s offer to provide free meals “set in motion” the forces resulting in the injuries to the residents. Therefore, “[l]iability will arise for public nuisance when one person’s acts set in motion a force or chain of events resulting in the invasion.” Interestingly, the Arizona Supreme Court did not discuss whether the events were foreseeable to the defendant, but instead limited its causation inquiry to damages actually caused.

Courts differ with respect to whether liability in a public nuisance case is limited to only the foreseeable consequences of the defendant’s actions. For instance, the court in Quinnett explained that a public nuisance “describes an inherently dangerous condition that has a natural tendency to inflict injury upon persons and property.” In Quinnett, a vendor selling liquor to a person operating a motor

212. Id. at 920.
213. Id.
214. Id. (quoting RESTATEMENT (SECOND) OF TORTS § 824 cmt. b).
215. Id.
vehicle did not proximately cause the public nuisance of a drunken motorist; thus, defendant was not liable. In contrast, the court in Commonwealth v. Barnes & Tucker Co., a case involving the application of strict liability, stated that "the absence of facts supporting concepts of negligence, foreseeability or unlawful conduct is not the least fatal to a finding of the existence of a common law public nuisance." Therefore, where courts apply strict liability, apparently a plaintiff need only show something less than proximate causation. According to one commentator, "[t]he appropriate causation analysis to be applied to public nuisance . . . is not the traditional tort test focussing on proximate cause, but rather one which has at its core an inquiry into defendant's use of the land." Therefore, where the court requires culpability on the part of the defendant, the nuisance must also be a proximate cause of defendant's actions.

Even if foreseeability of the injury is not required, the plaintiffs still must show that the defendant was the actual cause of the exotic infestation. This question of fact becomes a scientific burden because, in most cases, there is a lag time between exposure of the exotic to the ecosystem and the manifestation of an environmental problem. Therefore, by the time an exotic infestation becomes apparent, there may be no way to trace the introduction to an identifiable defendant.

As science progresses, this burden may be lightened for two reasons. First, ever-increasing scientific investigation will accumulate knowledge regarding the method of exotic introduction. Second, the greater the scientific scrutiny of ecosystems and their changes, the sooner exotic introductions will be identified. Consequently, a plaintiff's ability to establish the link between defendant's act and the

217. Id. at 789.


220. See, e.g., Quinnett, 568 A.2d at 788-89.

221. See, e.g., Yount, supra note 4, at 51 ("[e]cological explosions . . . differ from other kinds of explosions in that they do not make loud noises and do not happen instantaneously") (quoting CHARLES ELTON, THE ECOLOGY OF INVASIONS BY ANIMALS AND PLANTS (1958)).

222. See, e.g., Alien Species Prevention and Enforcement Act, supra note 79 and accompanying text (Act appropriates federal money to discover how exotics are imported into the United States).
condition alleged to be a public nuisance is a proof problem which may be solved by scientific evidence.\textsuperscript{223}

CONCLUSION

As illustrated, the application of old laws and statutes to new concepts may be troublesome. Society's value system and scientific knowledge stress the seams of tort law which developed amidst very different social attitudes. In the past, science and society were unaware of, or at least unconcerned with, the effects of exotic species. Today, environmental concerns like exotic species introductions are at the forefront of social issues, and science has discovered that the Earth's ecosystems are not indestructible. Consequently, environmental laws have been drafted to offer solutions and fill gaps existing in the common law. Nevertheless, current statutes also prove inadequate because they are relatively narrow and even more rigid in application than their common law counterparts.

However, public nuisance law is the engine behind most environmental laws. Its general principles, such as liability for interfering with public rights, enable it to adapt to peculiar situations. Furthermore, unlike most environmental laws which command and control, the tort system allows individuals to choose the most efficient way to avoid liability. Allowing individuals to determine the most effective methods of avoiding exotic pollution will produce solutions which best suit their operations, and will do so more expeditiously than governmental determination.

Tort law may not be a panacea for the exotics problem because current science may not be capable of establishing the link between the exotic manifestation and a defendant's harmful act. Nevertheless, as scientific sophistication increases, the remedy of public nuisance could become an effective reality.

\textsuperscript{223} See Bert Black & David H. Hollander, \textit{Unravelling Causation: Back to the Basics}, 3 U. BALT. J. ENVTL. L. 1 (1993), for an excellent discussion of the current state of law regarding proof of causation in toxic torts. Toxic torts are analogous to introduction of exotic species because there is a lag time between the exposure and the manifestation of the "disease" which makes it difficult to identify the defendant responsible and to determine the substance which caused the disease. \textsc{M. Stuart Madden, Toxic Torts Deskbook} §§ 1.1.2-1.1.3 (1992).