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Unwilling and Unable: Judicial and Administrative Responses to the Asian Carp Threat in the Great Lakes

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In 2012, Congress passed the Stop Invasive Species Act, which directed the Army Corps of Engineers to submit an action plan outlining ways to prevent the transfer of Asian Carp from the Missouri Basin into the Great Lakes. However, the Corps’ actions have proved ineffective, and the Asian Carp creep closer to the Great Lakes. In light of this, the Great Lakes states filed a public nuisance suit against the Corps for failing to prevent the transfer of Asian Carp. This Note considers whether public nuisance litigation or administrative action is better suited to prevent the spread of the Asian Carp.
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INTRODUCTION

“[I]nvasive carp are knocking on the door of the Great Lakes.”¹ This dire forecast should not be taken lightly. Asian carp are already present in the Chicago Area Waterways System (CAWS), the canal network that links the Illinois and Mississippi Rivers to Lake Michigan. If they access the watershed, the carp can easily establish sustainable populations.² As voracious eaters, these fish will likely ravage the lakes’ ecosystems, causing devastating losses of biodiversity and billions of dollars in damage to the fishing industry.³ These harms will not be confined to Lake Michigan. Once the fish reach it, they can easily access the other four Great Lakes, and all the major bodies of water in the eastern United States.⁴ Preventing the carp from entering Lake Michigan is therefore of the utmost importance.

¹. Michigan v. U.S. Army Corps of Eng’rs (Asian Carp II), 667 F.3d 765, 786 (7th Cir. 2011).
². Id. at 784 (finding “when and if the time comes, the carp are unlikely to have trouble establishing themselves in the Great Lakes”).
³. Id. at 781 (“The Corps . . . has said that invasive carp ‘have the potential to damage the Great Lakes and confluent large riverine ecosystems,’ and that it regards ‘[t]he prevention of an inter-basin transfer of bighead and silver carp from the Illinois River to Lake Michigan [as] paramount in avoiding ecologic and economic disaster.’”).
⁴. See U.S. ARMY CORPS OF ENG’RS, APPENDIX A: PHYSICAL OVERVIEW OF THE GREAT LAKES - ST. LAWRENCE RIVER SYSTEM A-2 to A-5 (2007) (explaining the interconnectivity of the Great Lakes). Lake Michigan and Lake Huron are hydrologically one lake, connected by the Straits of Mackinac. Id. at A-5, The Saint Mary’s River, a sixty-mile waterway including the Soo Locks, connects Lakes Huron and Superior. Id. The Saint Clair River connects Lake Huron to Lake Saint Clair, which is connected to Lake Erie by the Detroit River. Id. at A-6. Together, the Saint Clair River, Lake Saint Clair, and the Detroit River form an eighty-nine-mile channel between these two Great Lakes. Id. The Niagara River, a thirty-five-mile waterway including the Niagara Falls, connects Lake Erie to Lake Ontario. Id. These two lakes are also connected by the Welland Canal, which bypasses the Niagara Falls. Id. The Saint Lawrence River connects Lake Ontario to the Gulf of Saint Lawrence, which connects to the Atlantic Ocean. See id.
The Asian Carp litigation was one attempt to do just that. In the proceedings, the Great Lakes states—Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania—brought a federal common law public nuisance claim for a preliminary injunction ordering the U.S. Army Corps of Engineers to close the CAWS in order to prevent the carp’s migration into Lake Michigan. Their efforts proved futile. After years of litigation, the Seventh Circuit denied the injunction and deferred to the Corps’ efforts to prevent the Asian carp from entering the Great Lakes. However, the Corps has not taken any recent prevention efforts and the Asian carp continue to advance on Lake Michigan.

This Note considers whether agency deference was appropriate in this situation given the Corps’ failure to prevent the infiltration of the Asian carp. In particular, this Note explores whether public nuisance litigation or administrative action would have provided a better policy solution to the Asian carp threat and nonnative invasive species generally. The Note first identifies a set of factors by which to evaluate the two remedies, judicial and legislative/administrative. These criteria are based in part on the concerns that the court raised in the Asian Carp litigation and in part on scholarship in the area. These criteria are then used to assess the viability of federal common law public nuisance litigation as a response to invasive species threats. Next, this Note assesses legislative and administrative action based on these criteria by analyzing these branches’ responses to the analogous zebra mussel invasion in the Great Lakes. Finally, based on these assessments, this Note concludes that while the courts were correct in deferring to other branches of government, they should have employed their powers to require the agencies to take action within a specific time period.

I. BACKGROUND ON ASIAN CARP

Although the term is used broadly, “Asian carp” actually refers to two species of nonnative invasive fish, the silver carp (Hypophthalmichthys molitrix) and the bighead carp (Hypophthalmichthys nobilis). Both species were intentionally imported by catfish farmers in the southern United States in the 1960s to clean ponds by consuming drifting animal, plant, and other bacterial materials. However, flooding starting in the 1970s allowed the

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5. Asian Carp II, 667 F.3d at 769.
7. Id. at 894.
8. Id. at 906–07.
Asian carp to escape into the Mississippi River, initiating its ongoing northward migration.\footnote{11}{Asian Carp IV, 758 F.3d at 894–95.}

The carp have thrived in these freshwater environments, ravaging every ecosystem they enter. As filter feeders, the Asian carp have evolved to consume plankton continuously while swimming,\footnote{12}{Leung, supra note 9, at 541 (“[A]s water is forced across the gills, surface capillaries capture dissolved oxygen and gill rakes capture plankton.”).} allowing both species to eat between 20 and 120 percent of their body mass daily.\footnote{13}{Id.} Consequently, the silver carp can weigh up to sixty pounds, while the bighead carp can weigh up to one hundred pounds, and both species can measure five feet in length.\footnote{14}{Id.} This voracious appetite poses a formidable threat to native ecosystems.\footnote{15}{Id.} The carp deplete plankton stocks that native species rely on for sustenance, which leads to a reduction in the populations of these species.\footnote{16}{Id.} Thus, the carp’s destructive capacity is in its power to compromise the ecosystem’s entire food chain by eliminating native fish species’ food sources at the lowest levels of the food chain.\footnote{17}{Id.}

This food chain degradation has been detrimental to freshwater ecosystems. Since escaping the catfish farms, the Asian carp have overwhelmed the Mississippi River basin.\footnote{18}{Asian Carp IV, 758 F.3d at 896.} A 1999 fish kill conducted near St. Louis showed that Asian carp constituted about 95 percent of the biomass in that region of the Mississippi River.\footnote{19}{Id.} Biologists have found that both species of carp can spawn multiple times a year, producing up to one million eggs each time.\footnote{20}{Id.} Additionally, like many other invasive species, the Asian carp lack indigenous predators in American waterways to constrain their populations in these ecosystems.\footnote{21}{Joel Hood, Asian Carp Forces Troubleshooters to Dream Big, CHI. TRIB. (June 27, 2010), http://articles.chicagotribune.com/2010-06-27/news/ct-met-0627-asian-carp-20100626_1_carp-lake-michigan-chicago-river.} Thus, if allowed to enter the Great Lakes, the carp could
easily dominate the nation’s freshwater ecosystems.\textsuperscript{22} Beyond environmental
harms, Asian carp also threaten people and inhibit recreational activities.\textsuperscript{23}
Loud noises, such as those caused by motorboats, agitate the carp. In response,
they leap about ten feet in the air, causing personal injuries and property
damage.\textsuperscript{24} As will be discussed below, all of these impacts could cause severe
economic injury to these regions.

II. THE ECOSYSTEM AND ECONOMY OF THE CAWS AND THE GREAT
LAKES

After their introduction into the Mississippi River, the Asian carp travelled
upstream and established breeding populations throughout the Mississippi and
Illinois Rivers.\textsuperscript{25} As noted above, both of these rivers connect to Lake
Michigan via the CAWS,\textsuperscript{26} a system of canals, channels, locks, and dams that
connects four points on Lake Michigan to the Chicago River and tributaries of
the Mississippi and Illinois Rivers.\textsuperscript{27} Because this is the carp’s only point of
entry into Lake Michigan, and from there the rest of the Great Lakes, closing
the CAWS is the most certain way of preventing the Asian carp from
infiltrating the other freshwater ecosystems in the United States.\textsuperscript{28}
Unfortunately, closing the canal system—permanently sealing the locks to
separate the water bodies—would trigger a different set of problems.\textsuperscript{29}

The CAWS has been vital to the economic development of the Great
Lakes region. By creating a navigable route between the Mississippi River and
the Great Lakes, it commercially links the Southwest and Midwest to the East
Coast and Atlantic Ocean.\textsuperscript{30} In particular, this link allows cargo vessels bearing
large quantities of steel, petroleum, and other cargo to pass through Lake
Michigan into the Illinois and Mississippi Rivers and ultimately into the Gulf of
Mexico.\textsuperscript{31} Closing the CAWS would limit this transport, increasing costs,
slowing shipments, and ultimately compelling many Chicago-based businesses
to relocate.\textsuperscript{32} Indeed, one estimate places the cost of forcing vessels to seek an
alternate route at $90 million per year.\textsuperscript{33} Nor is the harm purely economic. In

\begin{itemize}
\item \textsuperscript{22} Leung, supra note 9, at 542.
\item \textsuperscript{23} Asian Carp IV, 758 F.3d at 896.
\item \textsuperscript{24} Id.
\item \textsuperscript{25} Id.
\item \textsuperscript{26} Asian Carp II, 667 F.3d 765, 767 (7th Cir. 2011).
\item \textsuperscript{27} Id.
\item \textsuperscript{28} Leung, supra note 9, at 545.
\item \textsuperscript{29} AMY ANTONIOLLI, SCHIFF HARDIN LLP, THE CHICAGO AREA WATERWAY SYSTEM: HOW DO
wings/pdfs/Antoniolli_Chicago_Area_waterway_System.pdf.
\item \textsuperscript{30} Asian Carp II, 667 F.3d at 767.
\item \textsuperscript{31} Leung, supra note 9, at 545.
\item \textsuperscript{32} Id.
\item \textsuperscript{33} Id. at 546.
\end{itemize}
the absence of alternative water routes, 1.3 million more trucks would be needed to meet transportation needs, increasing air pollution.34

Closing the CAWS also raises safety concerns. The Coast Guard is stationed on the Lake Michigan side of the CAWS and travels through the CAWS to respond to safety emergencies on the canal and in the river system.35 In addition, the CAWS is used to control flooding in the region by diverting water from the canals into Lake Michigan during heavy rains and seasonal high waters.36

Moreover, closing the CAWS would also pose a risk to public health. The CAWS reverses the flow of the Chicago River, thus channeling Chicago’s wastewater away from Lake Michigan and preventing waste from accumulating on Chicago’s shoreline.37 If a hydrological separation were implemented, that waste would begin to flow into Lake Michigan. This raises concerns about the potential levels of bacteria, phosphorous, and possibly ammonia and mercury in the water because Chicago does not treat its wastewater to the extent required by Lake Michigan’s strict water quality standards.38 And while treating the water to the extent necessary is possible, thereby mitigating health concerns, it would nevertheless be an added cost.39

These concerns must be weighed against the damage that would result from an Asian carp invasion. If the fish reach Lake Michigan they will have access to all of the Great Lakes and St. Lawrence water bodies, thus disrupting all of the aquatic ecosystems and economies in northeastern United States.40 Considering the Great Lakes’ economies alone, the costs are significant. The Great Lakes’ commercial and recreational fisheries depend on aquatic biodiversity.41 The commercial fisheries generate approximately $1 billion per year, mostly from lake fish, yellow perch, and walleye.42 The recreational fishing industry, worth $7 billion, relies on the supply of salmon, trout, bass, northern pike, muskellunge, walleye, and lake sturgeon for anglers.43 Admittedly, most of these species are tertiary predators, not immediately threatened by the Asian carp.44 Still, their populations, and hence the fishing

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35. Leung, supra note 9, at 546.
36. Asian Carp II, 667 F.3d 765, 767 (7th Cir. 2011).
37. Id.
39. Id.
40. See supra note 4 (describing the connections between the Great Lakes).
41. Leung, supra note 9, at 544.
42. Id. This value accounts for commercial fishing in the United States and Canada on the Great Lakes. Id.
43. Id.
44. Id.
industry, would eventually be endangered by the decrease in prey fish available due to competition if the Asian carp were established in the Great Lakes. The carp even threaten the $2.6 billion per year hunting industry. Hunters seeking native and migratory waterfowl are drawn to the Great Lakes. Yet Asian carp would harm the waterfowl populations by competing for vegetation, crustaceans, and zooplankton common to both diets. In sum, allowing the Asian carp to establish a sustainable population in the Great Lakes will inflict significant economic and ecological damage to the region.

III. THE SITUATION AT THE TIME OF TRIAL

The agencies that oversee the CAWS, namely the Corps and the Metropolitan Water Reclamation District of Greater Chicago, have taken steps to halt the Asian carp’s passage through the CAWS into Lake Michigan. The Corps built the $20 million Dispersal Barrier System (DBS) in the CAWS, a series of three “electrically charged underwater cables meant to kill, shock or stun fish that try to bypass them.” The first demonstration barrier began operating in 2002, about twenty-five miles downstream from Lake Michigan. The second barrier was built in 2009, about 830 feet downstream from the first barrier. Finally, the third barrier, located 220 feet downstream from the second one, started operating in 2011. In 2013, the Army Corps of Engineers built Barrier I to replace the demonstration barrier.

Unfortunately, these barriers proved ineffective. In 2010, the Illinois Department of Natural Resources found a bighead carp in Lake Calumet, on the northern side of the DBS, six miles away from Lake Michigan. Moreover, in 2012, after all three barriers were operational, the Corps found Asian carp environmental DNA (eDNA) in Calumet Harbor, adjacent to Lake Michigan. eDNA is the genetic material that Asian carp release into the water in the form of secretions, feces, or urine. While it degrades over time in the environment,

45. Id.
46. Id.
47. Id. at 545.
48. Asian Carp IV, 758 F.3d 892, 896 (7th Cir. 2014); see Leung, supra note 9, at 540; Appendix I, infra p. 303.
50. Id.
51. Id.
it can still be collected and identified in water samples. Although eDNA tests do not necessarily indicate the presence of live carp, federal agencies consider them a “potential early indicator of Asian carp presence.” While there was disagreement between the courts about the reliability of this evidence, the Seventh Circuit held that eDNA indicates the “immediate presence of the carp.”

IV. Case Analysis

A. History, Definition, and Elements of Public Nuisance

Public nuisance is a legal doctrine that arose under English common law and is typically found in American property law and tort law. Modern courts define public nuisance as “an unreasonable interference with a right common to the general public, or with a right to which the whole public is entitled, and causes injury to the general public.”

While a minority of courts hold that public nuisance arises from the number of people affected, the majority apply the public nuisance doctrine based on the character of the conduct. When determining whether the conduct constitutes a public nuisance, the court considers the reasonableness of the action given the particular context. Courts do not consider the legality of the action, because otherwise lawful activities could constitute nuisances in certain circumstances. The Second Restatement of Torts explains that an action may constitute an unreasonable interference with a public right if (1) the conduct involves a significant interference with public health, safety, peace, comfort, or convenience; (2) the conduct is proscribed by a statute, ordinance, or administrative regulation; or (3) the conduct is of a continuing nature or has produced a permanent or long-lasting effect and the actor knows or has reason to know of the significant effect upon a public right.

If plaintiffs are able to show that the defendants’ action constitutes a nuisance, they may seek an injunction. Issuance of injunctive relief is left to the judge’s discretion. In the past, a plaintiff was entitled to injunctive relief upon proving a nuisance. However, since the industrial revolution, “courts have been reluctant to enjoin economically valuable” activities and therefore courts also consider the defendants’ rights to use the property without undue interference. For this purpose, courts today typically “balance the equities”

55. Id.
56. Id.
57. Asian Carp IV, 758 F.3d 892, 896 (7th Cir. 2014).
58. Id. at 900.
59. DAVID A. THOMAS, THOMPSON ON REAL PROPERTY § 73.03(b) (David Thomas ed., 1998).
60. RESTATEMENT (SECOND) OF TORTS § 821B (1979).
62. Id.; THOMAS, supra note 59, § 73.08(d).
before granting injunctive relief. The objective of the balancing test is to determine “which of the conflicting activities should prevail.” In determining whether to grant a preliminary injunction, courts use a three-part test. First, plaintiffs must show a likelihood of success on the merits of the claim. Second, plaintiffs must show imminent, irreparable harm. In the third stage, the court conducts a balancing test. In order to receive injunctive relief, the harm that plaintiffs will suffer without the injunction must outweigh the harm that defendants will suffer if the injunction is granted. In addition, the injunction has to serve the public interest, meaning that the court has to consider the consequences that such an injunction would have on the public. The plaintiff bears the burden of proof at all stages.

B. Initial Holding in the District Court for the Northern District of Illinois (Asian Carp I)

On July 19, 2010, Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania (the plaintiff states) filed a federal common law public nuisance complaint against the Corps and the District (the defendant agencies). The plaintiff states requested a preliminary injunction that would require the Corps and the District, in their capacity as managers of the CAWS, to take all “available measures, consistent with the protection of public health and safety” to prevent the Asian carp from entering Lake Michigan, and to eradicate any

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63. DOREMUS ET AL., supra note 61, at 56.
64. DOREMUS ET AL., supra note 61, at 53.
66. Id.
67. Id. at *18.
68. Id. at *16. Accordingly, the district court began by considering the plaintiffs’ likelihood of success on the merits. Id. at *13. However, before the court could assess the merits of the complaint, it had to determine (1) whether the Corps’ sovereign immunity had been waived and (2) whether federal statutes displaced federal common law in this area. Id. at *16–24, *17–20. The court found that neither concern would bar the plaintiffs’ lawsuit and moved onto the merits of the case. Id. at *20.
carp already present. The most significant of these measures was the plaintiff states’ request for the permanent closure the O’Brien Lock and Dam System. In assessing the plaintiffs’ likelihood of success on the merits, the district court considered whether the evidence collected to date “support[ed] the existence of a nuisance at this time, as opposed to a potential nuisance at some time in the future.” While the court conceded a reproducing population of Asian carp in the Great Lakes would have a permanent effect, it held that the possibility of this occurring was “too remote” to establish the existence of a nuisance. Thus it found that because the evidence did not show an unreasonable interference caused by the defendants’ operation of the CAWS, the plaintiffs had failed to establish the requisite likelihood of success.

The court then moved on to the imminent and irreparable harm assessment. Plaintiffs relied on positive eDNA results to show that the carp had bypassed the DBS and were entering Lake Michigan and that once established in the lake, they could cause irreparable damage. The court, however, found this unconvincing, holding that these results did not prove the Asian carp were likely to establish a breeding population in the Great Lakes. It explained that the minority of positive eDNA results found—compared to the vast majority of negative eDNA results—did not “establish the requisite likelihood of imminent or irreparable harm.” Moreover, positive eDNA results did not adequately confirm that there were live Asian carp above the DBS, much less a breeding population. Likewise, the single carp found upstream of the DBS in Lake Calumet did not prove that there was a sustainable population. Also, since “that one fish’s origins [were] unknown,” plaintiffs had failed to show that the

69. Id. at *1. These include (1) “using the best available methods to block the passage of, capture, or kill bighead and silver carp that may be present in the CAWS, especially in those areas north of the O’Brien Lock and Dam;” (2) “temporarily closing and ceasing operation of the locks at the O’Brien Lock and Dam,” except where this would interfere with public health and safety; (3) “installing and continuously maintaining permanent grates or screens” over the openings of all the sluice gates at the O’Brien Lock and Dam; (4) “installing and maintaining block nets” to function as “physical barriers to fish passage” in the Little Calumet River; (5) applying rotenone at specific locations in the CAWS where the fish are most likely to be present, such as the area north of the O’Brien Lock and Dam; (6) “continued comprehensive monitoring” of the carp in the CAWS, including eDNA testing; (7) obtaining bulkheads to facilitate closure of the O’Brien Lock; and (8) “designs, plans, and schedules for installation, operation, and maintenance of the physical barriers.” Id. at *1–2.

70. Located at the intersection of the Grand Calumet River and the Calumet River, the latter of which flows into Lake Michigan, the O’Brien Lock and Dam connects the CAWS to the Great Lakes. See Appendix 2, infra p. 304.


72. Id.

73. Id.

74. Id.

75. Id.

76. Id. at *27.

77. Id.

78. Id.
operation of the CAWS was responsible for its presence in the Great Lakes.79 Thus, the court found that the plaintiffs were unable to make an adequate showing that there was an imminent threat of a sustainable population of Asian carp in the Great Lakes caused by continued operation of the CAWS. The court held, while "the potential for damage to the Great Lakes [was] high, the level of certainty that any damage will occur is low."80

Finally, when balancing the harms and assessing the public interests at stake, the court again ruled against the plaintiffs, holding that the plaintiffs had failed to prove that the requested injunction would serve the public interest.81 It found that the injunction would compromise the CAWS’s function and that such an order would require the Corps to divert resources from other projects.82

While the court ruled against the plaintiffs on the basis of the three-part test for injunctive relief, the court also noted other concerns. In its conclusion, the court added that granting the requested injunction would have “the effect of substituting the Court’s judgment for the considered decisions of the multiple agencies that traditionally have balanced the competing concerns about flooding, public safety, and nuisance species in discharging their public duties relating to the area’s water resources.”83 Essentially, the district court acknowledged that, unlike the agencies, it was not situated to balance these competing concerns and issue policy responses to the threat. In light of this, the court deferred to the agencies’ expertise.

C. The First Appeal to the Seventh Circuit (Asian Carp II)

The plaintiff states appealed to the Seventh Circuit, which heard the case in May 2011 and issued a decision at the end of August that same year. The appellate court held that the district court’s denial of injunctive relief was not an abuse of discretion and upheld the decision. Yet the opinion’s preliminary injunction analysis contradicted the lower court’s analysis in two key respects.84 First, it established that the plaintiffs were not precluded from reinitiating the public nuisance claim if the facts were to change. Second, the court expressed clearer standards for the plaintiffs’ showings.85

The court began the three-part test by considering the plaintiffs’ likelihood of success on the merits.86 The court found that the lower court had “improperly equat[ed] likelihood of success with success” by applying public nuisance law standards at this stage, instead of the less stringent preliminary

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79. Id.
80. Id. at *30 (internal quotations omitted).
81. Id. at *32.
82. Id. at *31–32.
83. Id. at *33.
84. Asian Carp II, 667 F.3d 765, 769 (7th Cir. 2011).
85. Id.
86. Id. at 781.
injunction standards. The circuit court ultimately decided that “given the magnitude of the harm, [it was] inclined to give the benefit of the doubt to the states” in considering whether they had demonstrated a likelihood of success on the merits. The court next considered whether the states had successfully shown that “irreparable harm was likely without an injunction.” The court noted that all parties agreed that the Asian carp entering the Great Lakes would indeed cause irreparable economic and environmental harm. The court then considered the imminence of the threat. Here, the plaintiff states had to show that there was “more than a mere possibility that the harm will come to pass, but the alleged harm need not be occurring or be certain to occur before a court may grant relief.” Unlike the district court, the circuit court gave weight to the eDNA results, noting “the intense factual dispute . . . about the rate at which invasive carp are progressing makes evaluating its likelihood even more tricky.” Because of this uncertainty, the circuit court decided, “given the dire nature of the harm posed by the carp and their close proximity to the CAWS, we again will give the plaintiff states the benefit of the doubt.”

The court then moved onto the balancing test. Here, the circuit court agreed with the lower court that the requested injunction would do more harm than good. Like the district court, it found that an injunction would hinder the efforts of the government bodies working to prevent the Asian carp from entering the Great Lakes. Significantly, the Seventh Circuit agreed with the lower court’s view of courts’ institutional competency in this area, noting, “from an institutional perspective courts are comparatively ill situated to solve this type of problem.” Hence like the district court, the Seventh Circuit deferred to the agency’s expertise and institutional role. The circuit court expanded on this discussion in the next hearing.

87. Id. at 782–83 (quoting Univ. of Tex. v. Camenisch, 451 U.S. 390, 394 (1981)).
88. Id.
89. Id. at 787.
90. Id. at 788.
91. Id. eDNA test results should be given weight on two grounds. First, eDNA testing can detect fish even when they are present in low numbers, or where traditional methods of capture would be futile. See id. at 784. Second, the Corps and other federal agencies have endorsed eDNA testing, stating that they use and will continue to use eDNA to monitor the Asian carp. Id. Further, the circuit court concluded, “once in the Great Lakes, the invasive carp [will] make it their home.” Id. at 785.
92. Id. at 789.
93. Id.
94. Id.
95. Id.
96. Id. at 790.
97. Id.
D. District Court Holding on Remand (Asian Carp III)

After the Seventh Circuit affirmed the lower court’s denial of injunctive relief, the district court granted the defendants’ motion to dismiss.98 In doing so, the district court held that while federal agency actions could constitute public nuisances, the plaintiff states had failed to show the alleged harm constituted “an unreasonable interference.”99 The reasoning was straightforward. The alleged cause of the nuisance was the defendants’ failure to close the CAWS.100 Yet, it would be unlawful for defendants to do so; the Rivers and Harbors Act prohibits them from placing barriers in “canals and navigable rivers, such as the CAWS, without congressional approval.”101 Furthermore, Congress has ordered the Corps to “to use funds to maintain and operate” the CAWS, meaning that Congress intends for the CAWS to continue operating.102 Thus, because public nuisance doctrine provides that actions authorized by statute or regulation do not give rise to nuisance liability, the district court found that the alleged harm could not constitute an unreasonable interference.103 The court dismissed the case for failure to state a claim because the plaintiffs were not able to show an unreasonable interference.104

E. The Final Decision by the Seventh Circuit (Asian Carp IV)

In response to the district court’s dismissal, the plaintiff states again appealed to the Seventh Circuit, which addressed three questions. First, whether federal action could constitute a public nuisance, or all federal action inherently served the public interest.105 Second, whether the plaintiffs had stated a public nuisance claim.106 Third, whether any other grounds supported the district court’s conclusion that the plaintiff states had failed to state a claim.107

The circuit court first found that agencies could be held liable for public nuisances even though congressional actions could not constitute public nuisances.108 The opinion explained that when Congress passes a statute it balances and represents the public interest; therefore actions explicitly

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99. Id. at 759.
100. Id.
101. Id. at 751.
102. Id. at 757.
103. Id. at 758.
104. Asian Carp IV, 758 F.3d 892, 901–02 (7th Cir. 2014).
106. Asian Carp IV, 758 F.3d at 900.
107. Id.
108. Id. at 895.
109. Id.
authorized by statute cannot constitute an unreasonable interference.\textsuperscript{110} However, discretionary agency actions reflect only the agency’s choice of a particular means to implement a policy, and thus are not inherently consistent with the public interest.\textsuperscript{111} Hence agency actions are not immune to public nuisance challenges.

That in mind, the court next explored whether the plaintiff states had stated a federal common law public nuisance claim.\textsuperscript{112} It ruled that while the Rivers and Harbors Act implied that the Corps was bound to facilitate navigation by maintaining and operating the waterways, it did not specifically require the Corps to keep the CAWS “open at all times, under all circumstances.”\textsuperscript{113} The court pointed out that while the Corps was “fully authorized” to operate the CAWS, it was not authorized to adversely affect the Great Lakes by allowing the Asian carp to migrate into Lake Michigan.\textsuperscript{114} The court distinguished between what the Corps was authorized to do and what it was obligated to do. While the Corps claimed that they were obligated to maintain the CAWS, the court held that they were only authorized to do so. Because they were not explicitly obligated to operate the CAWS, their decision to do so could constitute an unreasonable interference subject to federal common law public nuisance litigation.\textsuperscript{115}

However, in this instance, the court held that the agency’s action did not constitute a public nuisance, because the Corps was already aware of the threat posed by the Asian carp and was taking measures to prevent their migration.\textsuperscript{116} The court noted, “it is the defendants’ apparent diligence, rather than their claimed helplessness, that is key to [the court’s] holding today.”\textsuperscript{117} The circuit court again noted that it did not have the power to grant this injunction because it would have limited the Corps’ discretion to the court-ordered method of hydrological separation.\textsuperscript{118} The circuit court held that such an order “would be an extraordinary and likely inappropriate use of a federal court’s equitable powers.”\textsuperscript{119} The court also emphasized it was leaving “open the possibility of relief should there come a time when reliable facts showed that the carp pose a more immediate threat to the Lakes, or when the Corps and the District slacken their efforts to prevent the passage of the Asian carp out into Lake Michigan.”\textsuperscript{120}

\textsuperscript{110} Id.
\textsuperscript{111} Id.
\textsuperscript{112} Id. at 902.
\textsuperscript{113} Id.
\textsuperscript{114} Id.
\textsuperscript{115} Id.
\textsuperscript{116} Id. at 906.
\textsuperscript{117} Id.
\textsuperscript{118} Id.
\textsuperscript{119} Id.
\textsuperscript{120} Id. at 907.
Ultimately, the court deferred to the agencies to select the best method of preventing the spread of the Asian carp, noting that the agencies had taken certain measures to effectively prevent the carp’s migration. The court noted that the injunction “might not provide any relief to the States, because its effectiveness would depend entirely on the independent workings of another branch of the federal government.”\(^\text{121}\) The court acknowledged that the Corps is “making diligent efforts to find the solution best suited to accommodating the competing concerns of stopping the passage of the fish.”\(^\text{122}\) The court expressly stated, “Cognizant of our relative expertise as compared to that of the responsible executive agencies, we are reluctant to interfere with the ongoing process to determine the best alternative for keeping the Asian carp out of the Great Lakes.”\(^\text{123}\)

V. FACTORS TO DETERMINE WHICH BRANCH OF GOVERNMENT IS BEST-SUITED TO RESPOND TO THE ASIAN CARP THREAT

This Note seeks to determine whether courts or agencies are better situated to respond to the spread of the Asian carp. It will evaluate these systems of policy implementation along three categories: the procedure of developing the policy, the expertise used in developing the policy, and the substance of the policy. In every opinion in the Asian Carp cases, the courts stated that they were “ill-situated” to respond to the threat posed by the Asian carp and deferred to the agencies for various reasons.\(^\text{124}\) The following categories were chosen based on the reasons the district and circuit courts articulated in claiming that they were not best situated to respond to the Asian carp threat.

The first set of criteria concern the institution’s policy development procedure. The main consideration here is the time required to develop and implement appropriate policies while complying with these procedural requirements.\(^\text{125}\) Efficiency is especially vital in the invasive species context, because once a species has settled in an ecosystem, it can inflict significant damage almost immediately.\(^\text{126}\) Once this has occurred, it is often impossible to eradicate the invasive species or reverse the damage.\(^\text{127}\) Thus, the best system to respond to such circumstances will be one that can prevent the species from entering the ecosystem or at least eradicate it as soon as it is identified.\(^\text{128}\)

The next criteria upon which to evaluate the branches of government is expertise. The motif in the Asian carp litigation was that the courts do not have

\(^{121}\) Id.
\(^{122}\) Id. at 905.
\(^{123}\) Id.
\(^{124}\) Asian Carp II, 667 F.3d 765, 790 (7th Cir. 2011).
\(^{126}\) Id. at 386.
\(^{127}\) Id.
\(^{128}\) Id. at 387.
the ability or the necessary knowledge to adequately balance competing interests to develop a fair policy.\textsuperscript{129} It is important that the system have access to expertise and scientific knowledge upon which to base its policy choices.\textsuperscript{130} Specifically, this Note will consider three factors. First, because both the invasive species and the prevention efforts implicate so many interests, it is important to consider the extent to which the system is aware of and will be able to appropriately balance all of these competing interests.\textsuperscript{131} Second, because invasive species cause environmental damage beyond economic impacts, it is important that the system be able to appropriately account for nonpecuniary interests.\textsuperscript{132} Fourth, it is important that the system have familiarity with the interests necessary to properly make these assessments.\textsuperscript{133}

Finally, this Note will consider which system has the ability to develop the most effective policy in terms of substance. There are four factors to consider in making this assessment. First, the policy needs to be able to adequately prevent future harms, while also remedying past injuries.\textsuperscript{134} At a basic level, this concerns whether the policy works or not. This factor seeks to determine whether the policy adequately compensates the victims of the environmental harm and whether the policy will work to prevent the invasive species from settling in the ecosystem or at least minimize the damage it can cause in the future.\textsuperscript{135} The second factor is whether the solution allocates the costs of prevention or damage control to the responsible parties.\textsuperscript{136} It is vital that the party facilitating the introduction bear the cost of either preventing the introduction altogether or compensating for the damage caused by an invasive species. The third factor that needs to be considered is the finality of the decision. If a policy is ineffective, victims must have a means of recourse to obtain a better policy. This is especially crucial in the invasive species context, where the scientific basis of a policy decision is subject to change. And finally, it is important to consider whether the policy is dynamic enough to be applied effectively to invasive species generally or if it is limited to one particular invasion.\textsuperscript{137} A policy that has broad application will save time and resources and be able to preemptively respond to other invasions.

\textsuperscript{129} Asian Carp II, 667 F.3d at 790.
\textsuperscript{130} Id.
\textsuperscript{131} Id.
\textsuperscript{132} Id.
\textsuperscript{133} Id.
\textsuperscript{134} Biber, supra note 125, at 386--87.
\textsuperscript{135} Id. at 399, 401.
\textsuperscript{136} Id. at 399.
\textsuperscript{137} Id. at 396.
VI. FEDERAL COMMON LAW PUBLIC NUISANCE DOCTRINE AS A MEANS OF RESOLVING INVASIVE SPECIES THREATS

The criteria given in Part V explain what is necessary for the promulgation of an ideal policy response to the threat of an Asian carp invasion. This Part will first explain the federal common law public nuisance doctrine, explain its background, and then assess how well the doctrine meets those criteria based on its application in the Asian Carp cases.

A. Procedural Considerations

In considering which branch of government is best suited to respond to the invasive species threat, there are two main procedural considerations that have to be assessed: first, the requirements necessary for an institution to take action and second, the institution’s ability to promulgate policy in a timely manner.

1. Requirements Necessary to Catalyze Action

Many legal scholars have criticized the public nuisance doctrine for being unresponsive to the threat of invasive species. The main reason is that in order to be effective, the doctrine needs to respond quickly before significant damage occurs. Yet a court can only issue injunctive relief to abate a nuisance if the plaintiff is able to make an adequate showing for every prong of the three-part test. Unfortunately, litigation is compromised for two reasons. First, victims are disincentivized from pursuing legal action because they must bear the costs of litigation while the benefits are diffuse. Second, plaintiffs have difficulty meeting the legal standards for injunctive relief before significant damage occurs.

Since nuisance law requires victims to take initiative, it is susceptible to collective action and free rider problems. Collective action problems arise because environmental harms are often spread across broad segments of society, with individuals suffering only small injuries. As a result, individuals frequently lack a sufficiently strong incentive to act, even though the aggregate effect of the harm is substantial. This is especially problematic in the nuisance context: while all legal actions require a significant investment of resources, “the convolutions of nuisance doctrine” result in especially extensive litigation. Further, because all members of the community would benefit from abatement of the harmful conduct, potential plaintiffs may “free ride” on

139. Biber, supra note 125, at 387.
140. Id. at 446.
In this regard, invasive species are analogous to more traditional environmental nuisances, such as a power plant that emits pollutants over a wide area—many are affected, but few (if any) are impacted enough to be motivated to bring a lawsuit. This disincentive has a major impact because the nuisance doctrine is meaningless if victims are unwilling to litigate their claims.

Standing requirements present another obstacle. Courts can only hear public nuisance claims if the plaintiff has standing to bring the suit. In order to establish standing, the plaintiff must show that the harm they suffered is “substantially different” from the harm suffered by the general public. Given the diffuse impact of environmental harms, this is especially difficult to show in environmental nuisance litigation. Furthermore, plaintiffs have to demonstrate an enforceable property right in the environmental resource. This is especially relevant in the invasive species context, because it will be impossible for many affected parties to demonstrate a property right in ecosystem health.

Along the same lines, “courts have struggled to find principled bases for addressing the claims of those who are economically dependent upon a natural resource but lack a proprietary interest in the affected land.” This leads to a shortage of plaintiffs who can bring public nuisance claims. Fortunately, the plaintiff states in the Asian Carp cases had standing and clear incentives to pursue litigation. In Georgia v. Tennessee Copper Co., the Supreme Court established that a state, in its capacity as a quasi-sovereign, can bring a claim for an injury and that the state “has an interest . . . in all the earth and air within its domain.”

Litigating a common law public nuisance claim remains extremely challenging even after the initial obstacles are overcome. Plaintiffs must first show that a defendant’s actions constitute a substantial and unreasonable interference with public property or public rights. The first element of the doctrine requires proving causation. Plaintiffs may struggle to show causation in an invasive species nuisance case for two reasons. First, the invasive species may appear in an ecosystem without a clear indication as to how it entered the United States or which party is responsible for its introduction. Thus, plaintiffs are unable to prove that the defendant was responsible for the introduction as opposed to a different party or a force of nature. Second, there

\[\text{other plaintiffs’ lawsuits instead of initiating their own claims.}\]

\[\text{In this regard, invasive species are analogous to more traditional environmental nuisances, such as a power plant that emits pollutants over a wide area—many are affected, but few (if any) are impacted enough to be motivated to bring a lawsuit. This disincentive has a major impact because the nuisance doctrine is meaningless if victims are unwilling to litigate their claims.}\]

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is “a lag between exposure of the nonnative aquatic species and the manifestation of the economic or environmental problem,” making it difficult to prove that the introduction of the invasive species is responsible for adverse affects on the environment and economy.151

The difficulty of establishing causation in the Asian Carp cases helps illustrate this point. The source of the Asian carp was known—they inadvertently escaped into the Mississippi River basin during floods.152 Yet seeking an injunction against the farmers responsible for the initial introduction decades later would be ineffective because their current activities are not responsible for the potential nuisance in the Great Lakes. The parties that can prevent the nuisance from interfering with the Great Lakes, the Corps and the District, have taken nominal steps to mitigate the nuisance, making it harder for plaintiffs to show defendants’ actions are responsible for the impending environmental harm, since courts take defendants’ mitigation efforts into account.153

Once the defendant is identified as the responsible party, the plaintiff has the burden of making adequate showings at each stage of the three-part test for injunctive relief. First, they have to show that the action constitutes an unreasonable interference; second, that the harm they suffer from the action outweighs the harm that the defendant will suffer from the injunction; and third, that the injunction serves the public interest.154 This will be especially challenging for plaintiffs when the action they seek to enjoin is economically beneficial to the public or where it is viewed as “normal” or “appropriate.”155 All of these decisions are subject to judicial discretion, thus it is difficult to determine exactly how much damage is necessary to catalyze judicial action.

These challenges were manifested in the Asian Carp cases. Plaintiffs received inconsistent rulings regarding causation and whether the agency’s manner of operating the CAWS constituted an unreasonable interference. Ultimately their claim for injunctive relief was denied at the second and third prongs of the three-part test. The courts did not want to interfere with the agencies’ efforts and believed that the injunction would hinder these efforts, compromising the public interest in limiting the carp’s access to the Great Lakes. All parties acknowledged the gravity of the harm, but the court denied the injunction because it found that maintaining and operating the CAWS served necessary public interests.

The disincentive for initiating legal action, the shortage of plaintiffs, and the burdens inherent in public nuisance litigation make it very difficult to

152. Asian Carp II, 667 F.3d 765, 765 (7th Cir. 2011).
153. See THOMAS, supra note 59, § 73.08(a) ("[O]ne component of the unreasonableness of the interference is the lack of defendant’s efforts to mitigate the harm caused by the nuisance.").
155. Biber, supra note 125, at 448.
obtain injunctive relief unless significant economic and environmental damage can be shown. Thus, there are very stringent requirements to catalyze judicial action.

2. Efficiency

If liability is established and the court grants injunctive relief, courts are well situated to order injunctions in a timely and cost-effective manner. In other words, their implementation mechanisms are very efficient.\(^\text{156}\) A court does not have to solve the invasive species problem itself, rather it can order the responsible party to develop a preventive strategy within a specified timeframe.\(^\text{157}\) It can also set timelines for compliance, and appoint special masters to monitor progress.\(^\text{158}\) And finally, courts can retain jurisdiction to ensure long-term compliance.\(^\text{159}\)

B. Access to Expertise

In the event that a court grants injunctive relief, it will have to either develop or approve a policy to respond to the invasive species. This raises expertise concerns: such a policy will require extensive knowledge and an appropriate balancing of competing environmental and economic interests. A policy based on incorrect information or a miscalculation of the interests could be unjust, ineffective, or even counterproductive.\(^\text{160}\) Both courts in the Asian Carp cases acknowledged their lack of familiarity with the implicated interests and deferred to the agencies’ expertise.\(^\text{161}\) To assess whether the courts were right to do so, this subpart will determine whether courts have access to the expertise necessary to develop an adequate policy to prevent the Asian carp from entering the Great Lakes. This determination will be based on three factors: First, the courts’ ability to balance competing interests; second, the courts’ ability to account for nonpecuniary interests; and third, the courts’ familiarity with the regional environment and economy.

1. Balancing

As seen in the Asian Carp cases, courts may be hesitant to change the status quo, recognizing their lack of familiarity with the environmental harm and economic implications at hand.\(^\text{162}\) Indeed, the first time Asian Carp

\(^{156}\) DOREMUS ET AL., supra note 61, at 56.
\(^{157}\) Ruiter, supra note 151, at 272.
\(^{158}\) DOREMUS ET AL., supra note 61, at 56.
\(^{159}\) Id.
\(^{160}\) Biber, supra note 125, at 449.
\(^{161}\) Asian Carp IV, 758 F.3d 892, 905 (7th Cir. 2014); Asian Carp I, No. 10-CV-4457, 2010 WL 5018559, at *33 (N.D. Ill. Dec. 2, 2010).
\(^{162}\) Asian Carp I, 2010 WL 5018559, at *33.
appeared before Judge Robert Michael Dow in district court, one of the reasons he gave for denying the preliminary injunction was that it would “have the effect of substituting the court’s judgment for the considered decisions of the multiple agencies that traditionally have balanced the competing concerns . . . in discharging their public duties relating to the area’s water resources.” Judge Dow’s words reflect a general presumption that judges are legal experts, while agencies are experts in all other fields. Thus, as the court noted, “requests for mandatory injunctive relief should be cautiously viewed and sparingly issued only upon the clearest equitable grounds.”

Given courts’ lack of expertise regarding invasive species and economics, they are ill suited to identify and balance the interests involved. However, under the federal common law of public nuisance, courts do have the ability to enjoin agencies to balance these interests and develop policy responses to invasive species. Nevertheless, in the Asian Carp cases, the courts simply deferred to the agencies’ decisions, despite evidence that their actions thus far had not prevented the spread of the Asian carp.

2. Accounting for Nonpecuniary Interests

Because nuisance doctrine is tied to property rights, compensation for environmental harm is usually limited to losses in property value and any physical or mental injuries. Thus, public nuisance doctrine cannot adequately compensate for nonpecuniary harms such as local ecosystem degradation, biodiversity decline, and cultural losses. Perhaps more importantly, the court does not have to consider these nonpecuniary interests in the balancing stage of the injunction analysis because nuisance doctrine protects property rights, not environmental quality. The public nuisance doctrine only protects the environment to the extent that environmental degradation translates into harm to property. This limits the effectiveness of public nuisance litigation in the invasive species context because most of the damage caused by invasive species is to non-appropriated interests.

163. Id.
164. Biber, supra note 125, at 449.
166. Id.
167. Asian Carp IV, 758 F.3d 892, 905 (7th Cir. 2014).
168. Biber, supra note 125, at 451. Thus, public nuisance may not adequately compensate all resulting diminutions in property values. For instance, stigma and “reputational harm” can lead to losses in property value even after the nuisance has been removed and rectified. Courts struggle with this, because although the economic damage is real, it is often “in some sense irrational.” DOREMUS ET AL., supra note 61, at 56.
169. Biber, supra note 125, at 453.
170. Id. at 449.
171. Id. at 449–50.
In the Asian Carp cases, the courts acknowledged both the threat Asian carp pose to the Great Lakes ecosystem and the public health concerns of closing the dam. But, in the test for injunctive relief, the courts weighed direct economic losses to the fishing industry against the direct economic impacts of closing the dam.

3. Familiarity

Judges are legal experts and may lack the environmental and economic expertise needed to issue appropriate decisions in the invasive species context. In the Asian Carp cases, for instance, the court had to consider economic interests in niche, region-specific industries. This included scientific analyses of the Asian carp’s impact on the Great Lakes ecosystem, public health impacts of closing the dam, economic interests in maintaining open channels of navigation, as well as the economic and environmental impacts that either decision would trigger. Furthermore, these effects had to be considered in relation to the major water systems in the eastern half of the United States since all of the water bodies are connected. While the courts engaged in research, they did not have the resources to become experts in these fields and their lack of knowledge made them hesitant to act.

C. Substantive Policy Considerations

While Part VII.C found courts lacked the expertise and familiarity needed to adequately balance all of the implicated interests, this subpart considers whether the court can nonetheless still develop a just and effective policy to respond to the threat of the Asian carp. In making that determination, this subpart will assess four factors necessary for an invasive species policy to be just and effective. First, the policy has to adequately prevent future injuries and remedy past injuries. Second, it has to allocate costs of preventing the nuisance and compensating victims to the responsible parties. Third, it has to provide a means of recourse for victims if the implemented policy is ineffective or counterproductive. And finally, the policy should be broadly applicable to a diverse range of invasive species threats, instead of being limited by species or region.

1. Preventing Future Injuries and Remediing Past Injuries

Advocates of the public nuisance doctrine argue that if it is applied to invasive species under a strict liability standard, the threats of liability and

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172. See, e.g., Asian Carp II, 667 F.3d 765, 768 (7th Cir. 2011).
173. Asian Carp IV, 758 F.3d 892, 905 (7th Cir. 2014).
174. Id.
175. Id.
judicial injunctions would prompt the parties often responsible for invasive species introductions to take measures to prevent unintentional introductions of invasive species into U.S. waters.\(^\text{176}\) These parties tend to be commercial actors familiar with their industry and with access to resources to prevent the introduction of invasive species, and are thus best situated develop cost-effective methods to prevent the introduction of invasive species without impeding their own operations.\(^\text{177}\) Thus, the application of the public nuisance doctrine to invasive species could incentivize self-regulation and compliance.\(^\text{178}\) However, this incentive only exists if parties believe that courts will apply strict liability and enjoin their operations or order them to pay damages. However, given courts’ hesitation in issuing injunctions, there is little reason for parties to draw this conclusion.\(^\text{179}\)

Indeed, the public nuisance doctrine’s reliance on self-regulation can make it counterproductive in the invasive species context. Courts tend to assume that because parties have an incentive to avoid nuisance liability, they have already used all plausible precautions in their operations and thus, their actions represent the least harmful alternative.\(^\text{180}\) This presumption leaves courts reluctant to grant preemptive injunctions and leads them to apply a heightened burden of proof, requiring plaintiffs to make their likelihood showing by “conclusive evidence.”\(^\text{181}\) The avoidance of preemptive injunctive relief is particularly detrimental in the invasive species context, because once an invasive species is established in an ecosystem it will be costly, if not impossible, to eradicate, and the environmental damage will most likely be irreversible.\(^\text{182}\) In most cases, removal of the nonnative invasive species will prove to be far more difficult than preventive measures.\(^\text{183}\)

The Asian Carp cases exemplify courts’ reluctance to grant injunctive relief and their presumption that responsible parties will conduct their operations in the least harmful way possible.\(^\text{184}\) Because the Corps had taken some actions to prevent the carp from entering the Great Lakes, the courts found that the agency was already doing everything in its power to mitigate the

\(^{176}\) Biber, supra note 125, at 444; Ruiter, supra note 151, at 12.

\(^{177}\) Id.

\(^{178}\) Id.

\(^{179}\) Id.

\(^{180}\) Pidot, supra note 141, at 207.

\(^{181}\) Id. These standards vary by jurisdiction and judge, but injunctive relief perpetually requires the plaintiff to prove “a high degree of certainty.” Id. However, it should be noted that there have been only two instances in the twentieth century where the federal courts have issued injunctive relief based on an anticipatory nuisance claim under federal common law, and both cases implicated environmental harm—one of which involved the CAWS—suggesting that courts may be more likely to issue injunctive relief where the environment is at stake. Id. at 208. Thus, there is disagreement as to whether courts will be more or less likely to issue injunctions in the context of invasive species given the severity of the potential harm. See id.

\(^{182}\) Id. at 206.

\(^{183}\) Biber, supra note 125, at 453.

\(^{184}\) Pidot, supra note 141, at 207.
threat, and that the agencies’ method of operating the CAWS was the least harmful way of doing so.\textsuperscript{185} These opinions also demonstrate the high degree of certainty that courts require from plaintiffs in common law public nuisance cases.\textsuperscript{186} For instance, despite the presence of carp and positive eDNA results, the court still refused to find that the agencies were operating the CAWS in a negligent manner.\textsuperscript{187} Thus, the application of the public nuisance doctrine limits its effectiveness both as a deterrent and as a remedy.

2. Allocation of Costs to Responsible Parties

Application of the common law public nuisance doctrine to invasive species requires that the parties who could introduce invasive species bear the costs of preventing the intentional and unintentional introduction of such species or compensating victims if prevention fails and the court finds them liable for public nuisance.\textsuperscript{188} As Matthew Shannon notes, “A tort liability system allows citizens most affected by invasive species to force industries to pay the costs that result from conducting the businesses that can eventually cause introduction of invasive species.”\textsuperscript{189}

While the federal common law public nuisance doctrine justly allocates the cost of preventing the harm to the responsible parties, it also imposes costs on victims when such harms occur.\textsuperscript{190} If the public nuisance doctrine cannot provide an incentive for self-regulation, the government will bear the costs of preventing harm by imposing regulation. Regardless, plaintiffs seeking injunctive relief under this doctrine face litigation expenses and enormous procedural obstacles that usually translate into massive transactional costs that they have to bear.\textsuperscript{191} Indeed, the plaintiff states in Asian Carp bore the costs of the four trials.

3. Finality of the Decision

As the Asian Carp cases demonstrate, the holdings issued in public nuisance cases can be challenged on appeal. The plaintiff states were unhappy with the district court’s holdings and appealed twice.\textsuperscript{192} Although in both decisions the circuit denied their requested injunctive relief, the appeals were successful in the sense that the circuit court held that the public nuisance claim could be viable and suggested suit could be reinitiated if the facts changed, whereas the lower court had dismissed the case, holding that the states had not

\textsuperscript{185} Asian Carp IV, 758 F.3d 892, 907 (7th Cir. 2014).
\textsuperscript{186} Pidot, supra note 141, at 207.
\textsuperscript{187} Asian Carp IV, 758 F.3d at 907.
\textsuperscript{188} Shannon, supra note 138, at 64.
\textsuperscript{189} Id. at 65.
\textsuperscript{190} Id.
\textsuperscript{191} Biber, supra note 125, at 449.
\textsuperscript{192} Asian Carp IV, 758 F.3d at 894.
raised a public nuisance claim.\textsuperscript{193} Thus, although appeals add to the costs of litigation, the federal court system does provide a certain level of recourse for victims of environmental harms if the higher court finds an error in the lower courts’ reasoning.

4. \textit{Potential for Broad Application to Invasive Species}

Proponents of nuisance law claim that its flexibility allows it to adapt to different types of invasive species in diverse ecosystems. These scholars argue that “the broad reasonableness test allows the definition and finding of a public nuisance to evolve over time” in order to respond to society’s values and needs.\textsuperscript{194} In turn, the doctrine’s dynamism allows for more judicial control over “what is otherwise a very amorphous and broad-reaching cause of action.”\textsuperscript{195} Thus, judges have the power to identify invasive species as public nuisances and can enjoin activities that could lead to their introduction. Consequently, although the public nuisance doctrine requires a case-by-case analysis, the basic structure can be applied broadly.

Yet while the reasonableness test can be broadly applied, it may not respond effectively to the threat of invasive species. In the \textit{Asian Carp} cases, for instance, prohibitive thresholds set at every stage of the litigation process per the judges’ discretion led to a denial of injunctive relief.\textsuperscript{196} Thus, while the common law public nuisance doctrine could in theory be applied to invasive species generally, in practice, courts’ reluctance to grant injunctions precludes this. However, since application of the doctrine is subject to judicial discretion, growing judicial appreciation of the harm invasive species cause may lead to a change in attitude.\textsuperscript{197}

VII. \textsc{Legislative Action as a Means of Resolving Nonnative Invasive Species Threats}

The courts in the \textit{Asian Carp} cases deferred to the federal agencies to resolve the invasive species threat in the Great Lakes. Yet one might reasonably wonder whether this was the right decision as a policy matter. To answer the question of whether agencies are in fact better suited to promulgate invasive species policy, this Part will consider the legislative and administrative response to the zebra mussel invasion in the Great Lakes in the 1980s and 1990s.\textsuperscript{198} Although Congress and the administrative agencies constitute different branches of government, their actions and powers can be assessed in

\textsuperscript{193} \textit{Id.} at 907.

\textsuperscript{194} Shannon, \textit{supra} note 138, at 56.

\textsuperscript{195} \textit{Id.}

\textsuperscript{196} \textit{Pidot, supra note 141,} at 207.

\textsuperscript{197} \textit{Id.} at 206.

\textsuperscript{198} \textit{See Leung, supra note 9, at 532–33 (describing federal efforts to combat zebra mussel infestation).}
the collective here, because agencies are tasked with implementing the will of Congress. To effect the comparison with judicial policy making, this Part will assess the agencies’ response according to the same criteria used to evaluate the public nuisance doctrine.

A. Background on Zebra Mussels

The Asian carp will not be the first invasive species to impact the Great Lakes. In 1988, zebra mussels (Dreissena polymorpha) arrived as larvae in the ballast water of ships traveling from Eurasia to the Great Lakes. Like the Asian carp, zebra mussels are filter feeders—they draw water into their bodies and filter it, thereby consuming microscopic plants, animals, and debris. The mussels’ ability to filter water at extremely fast rates severely depletes native species’ food supply. This depletion is also a result of the zebra mussels’ high reproductive rates; female mussels spawn between one hundred thousand and five hundred thousand eggs annually. Thus like Asian carp, zebra mussels disrupt the ecosystem by outcompeting native species at the lowest trophic levels, thereby depriving higher level predators of their food sources.

More significantly, however, the mussels’ excessive consumption of plankton causes decreased turbidity. Greater water clarity allows for deeper sunlight penetration, which increases vegetative growth. This prevents larger, tertiary fish species from finding their food sources among the thick vegetative growth and decreases the amount of dilute oxygen in the water, disrupting ecological stability. The end result is the creation of stagnant bodies of water with low oxygen concentrations—perfect breeding ground for mosquitos. Further, the increased vegetative growth also impedes boating, fishing, and swimming.

Additionally, because they are filter feeders, zebra mussels accumulate dissolved toxins within their bodies. Studies show that the concentration of organic pollutants within mussel tissue is over three hundred thousand times higher than the surrounding environment. Species that prey on the zebra mussels ingest all of these toxins and increase the concentrations within their bodies due to their higher trophic status.

201. Zebra Mussel, supra note 200.
202. Id. at 533; Zebra Mussel, supra note 200.
203. Id.
204. Leung, supra note 9, at 539.
205. Id. at 544.
206. Id.
207. Id.
208. Id. at 536.
210. Leung, supra note 9, at 539–40.
own tissues. Thus tertiary predators like the native perch are at a higher risk of poisoning. Nor is the risk limited to aquatic species; birds that prey on the predatory fish are also at risk of poisoning. Indeed, studies suggest that over fifteen years, one hundred thousand avian deaths have resulted from the bioaccumulation of toxins.

Beyond their threat to biodiversity, zebra mussels also interfere with human activity. They produce byssal threads—secretions that solidify—to adhere to surfaces, including ships and water pipes. A 2.5 centimeter mussel can produce 600 byssal threads to hold it in place. This allows the mussels to colonize and clog the surfaces of water intake pipes used by the Great Lakes states for industrial and municipal purposes. Consequently, the city of Monroe, Michigan had to pay $2 million when zebra mussels clogged a water intake system. In 1989, U.S. Fish and Wildlife predicted that zebra mussels would cause $5 billion worth of damage to the Great Lakes alone by the year 2000. Another U.S. Fish and Wildlife report predicted that controlling zebra mussels between 1990 and 2000 would cost approximately $5 billion.

B. The Nonindigenous Aquatic Nuisance Prevention and Control Act and the National Invasive Species Act

In response to the zebra mussel invasion, Congress passed the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA) in 1990. This act recognized that zebra mussels were introduced via ships’ ballast water and sought to prevent such unintentional introductions by regulating ballast water discharge. Ballast water is pumped into a vessel when it is carrying a light load to increase vessel stability. This water is then released at the destination port when the vessel is filled with cargo that provides vessel stability. Ballast water includes various species from the departure port, including small fish, jellyfish, bacteria, and viruses, all of which

211. Id.
212. Id.
213. Id.
214. Id. This has impacted species like the common loon, which is threatened in Michigan. Id.
216. Id.
217. Leung, supra note 9, at 538.
220. Applegate, supra note 218, at 392.
221. Leung, supra note 9, at 531.
223. Id. at 101.
224. Id.
are released into the destination port and thereby introduced into that ecosystem.\textsuperscript{225} NANPCA is significant because it was the first federal statue to focus on the problems created by invasive species, and to attempt to regulate the source of their introduction.\textsuperscript{226} NANPCA was forward-looking and sought to prevent future introductions and minimize the environmental impacts of those that nevertheless still occurred.\textsuperscript{227} Congress relied on several executive agencies in developing and implementing this statute. NANPCA directed the Secretary of Transportation to issue regulations preventing the release of exotic species into the Great Lakes, and encouraged the Secretary of State to negotiate with foreign actors to prevent the spread of invasive species.\textsuperscript{228} More importantly, it established an Aquatic Nuisance Species Task Force to coordinate aquatic nuisance species activities among the federal agencies and between federal agencies, regional, state, tribal, and local organizations.\textsuperscript{229} NANPCA also implemented a cooperative federalism model by establishing a federal grant to fund state efforts to monitor, eradicate, and prevent the entry of invasive species.\textsuperscript{230} NANPCA further authorized the Coast Guard to enforce regulations requiring ballast water exchange prior to entering any of the Great Lakes’ ports.\textsuperscript{231} This way, the ballast water collected in foreign ports will be replaced with saline oceanic water before the vessel enters the exclusive economic zone extending two hundred miles from the United States’ coast.\textsuperscript{232} This requirement was based on the assumption that this will clear the ballasts of any

\begin{itemize}
\item[225.] Id. NANPCA had four stated goals in regulating the sources of invasive species introductions: First, to prevent unintentional introduction and dispersal of nonindigenous species into waters of the United States; second, to coordinate research, prevention, control, information dissemination, and other activities regarding aquatic nuisance species; third, to develop and carry out environmentally sound control methods to prevent, monitor, and control unintentional introductions of nonindigenous species; and fourth, to understand and minimize economic and ecological impacts of nonindigenous aquatic species that become established. Leung, supra note 9, at 538.
\item[227.] Leung, supra note 9, at 538.
\item[228.] Id.
\item[229.] Id. The Task Force was composed of representatives from six federal agencies, as well as four ex-officio member organizations, and was chaired by the Director of the U.S. Fish and Wildlife Service and the Undersecretary of Commerce for Oceans and Atmosphere. NAT’L OCEANIC & ATMOSPHERIC ADMIN., AQUATIC NUISANCE SPECIES TASK FORCE 2 (n.d.), available at http://www.habitat.noaa.gov/pdf/best_management_practices/fact_sheets/Aquatic%20Invasive%20Species%20Legislation.pdf.
\item[230.] Leung, supra note 9, at 538.
\item[231.] Eldridge, supra note 199, at 53–54. The Act relied on the United States’ sovereign rights over its exclusive economic zone, which is the section of the ocean extending from the baseline of the territorial sea to 200 nautical miles from the country’s coast, to require vessels coming from foreign ports to exchange ballast water outside of this zone prior to approaching any of the Great Lakes’ ports. Id. at 54–55; What is the EEZ?, NAT’L OCEAN SERV., http://oceanservice.noaa.gov/facts/eez.html (last updated Dec. 8, 2014).
\end{itemize}
foreign freshwater species that would have otherwise been released into the Great Lakes’ ports. In 1996, NANPCA was reauthorized as the National Invasive Species Act (NISA). Like its predecessor, NISA regulated ballast water discharge. However, NISA broadened the scope of NANPCA, which only applied to ships bound for the Great Lakes watershed, to implicate vessels entering the Chesapeake Bay, Gulf of Mexico, Pacific Coast, Atlantic Coast, and San Francisco Bay-Delta Estuary.

The Coast Guard initially enforced both NANPCA and NISA’s ballast water exchange regulations as voluntary guidelines. Consequently, a 2003 investigation found that the Coast Guard had issued no fines and only five warning letters since NISA was passed. In response, the Department of Homeland Security amended the regulations to make the guidelines mandatory on July 28, 2004. The new regulations required all vessels with ballast water tanks, regardless of whether those tanks carried a significant amount of ballast water, to “perform complete ballast water exchange in an area no less than 200 nautical miles from any shore.” Moreover, under the new rules noncompliance could lead to a $27,500 civil fine per day or a Class C felony charge.

C. Procedural Considerations

As mentioned earlier, an effective response to an invasive species threat must be developed and implemented as soon as possible. The Asian Carp litigation occurred over four years and ended in judicial deference to legislative and executive branch action. This shows that the public nuisance doctrine was unable to provide an appropriate response in a timely fashion. This subpart evaluates the amount of time needed for the legislature to enact policy and the...
efficiency with which administrative agencies acted in response to the analogous zebra mussel infestation in the Great Lakes.

1. Requirements Necessary to Catalyze Action

This evaluation considers the amount of environmental and economic damage necessary to compel Congress to enact legislation authorizing agencies to respond to the zebra mussel crisis. While Congress implemented NANPCA and NISA with impressive speed, it took the agencies a considerable amount of time to effectively implement and enforce the provisions of the acts. Zebra mussels and their devastating impacts were first identified in Lake Erie in 1986.\textsuperscript{241} By 1988, Congress found that the Zebra mussels had infested all of the Great Lakes, Lake Champlain, and the Chesapeake Bay Watershed.\textsuperscript{242} The costs of the damage caused by these invasive species were borne by local authorities. By 1990, when Congress enacted NANPCA, cities and utilities had spent roughly $1.5 billion removing zebra mussels from water pipes.\textsuperscript{243} Congress enacted NANPCA within two years of recognizing the harm that zebra mussels were causing to the Great Lakes. Although a significant amount of damage had already occurred and local governments had already incurred significant costs as a result of the zebra mussel invasion, congressional action was catalyzed within a very short time span without imposing further costs on the victims of the environmental harms.

2. Efficiency

Despite the timely enactment of policy, both NANPCA and NISA have been criticized for their inefficient enforcement due to extensive administrative delays caused by the structure of the acts.\textsuperscript{244} For example, the Office of Technology Assessment criticized NANPCA for not providing the Task Force with detailed guidelines on how exactly to implement a ballast water control program.\textsuperscript{245} The Task Force was also often unable to cooperate and reconcile conflicts of interest between the various agencies represented in the Task Force.\textsuperscript{246} Delays also occurred because these efforts were spread across twenty federal agencies that lacked coordinated decision making.\textsuperscript{247} As a result of

\begin{itemize}
\item \textsuperscript{241} Don W. Schloesser et al., \textit{Zebra Mussel Infestation of Unionid Bivalves in North America}, 36 \textit{AM. ZOOLOGIST} 300, 302 (1996).
\item \textsuperscript{242} Leung, supra note 9, at 532.
\item \textsuperscript{243} Id.
\item \textsuperscript{244} Steven A. Wade, \textit{Stemming the Tide: A Plea for New Exotic Species Legislation}, 10 \textit{J. LAND USE & ENVTL. L.} 343, 351–52 (1995).
\item \textsuperscript{245} Id.
\item \textsuperscript{246} Id.
\item \textsuperscript{247} Id. at 364.
\end{itemize}
these obstacles, the Task Force was paralyzed by delays before regulations were actually promulgated and enforced.\textsuperscript{248}

\textbf{D. Access to Expertise}

The courts in the \textit{Asian Carp} litigation deferred to the federal agencies given their expertise. This subpart will evaluate whether the agencies do indeed have access to the broad range of expertise necessary to develop effective regulations and whether they are able to balance these competing interests and incorporate them when responding to invasive species.

1. \textit{Balancing}

The Acts implicated three broad parties: local governments and community members, the federal government, and vessel owners and managers. Thus, Congress had to balance the harm caused to the Great Lakes region against burdens on the shipping industry and administrative costs. It should be noted that because NANPCA and NISA regulated specific actions that introduced invasive species to specific regions, the statutes implicated fewer interests than laws with broader regulatory scopes. For instance, regulating the source of the Asian carp requires a hydrological separation, imposing extensive costs on the government and implicating many more interests.\textsuperscript{249}

Congress had to consider local parties’ interests in the ecology of their waterways as well as municipal and industrial reliance on those resources.\textsuperscript{250} Zebra mussels cause severe environmental degradation, resulting in a loss of biodiversity that harms the fishing industry and limits recreational activity in the lakes.\textsuperscript{251} They incapacitate the water intake systems that municipalities rely on for drinking water and industries rely on for cooling water.\textsuperscript{252} Local governments and taxpayers were bearing the costs for all of the damage caused by the unintentional introduction of these invasive species.\textsuperscript{253}

The acts also implicated federal interests in protecting the ecosystems of water bodies across the United States, protecting both the fishing and shipping industries, and facilitating interstate and international commerce. Furthermore, Congress had to consider the administrative and fiscal costs arising from enforcing zebra mussel prevention and control.

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{248} \textit{Id.} at 351–52.
\item \textsuperscript{249} Davey, \textit{supra} note 34. Chief Judge Andrea Wood stated that, depending on where the separation was placed, the cost would be between $15.5 billion and $18.3 billion. \textit{Asian Carp IV}, 758 F.3d 892, 899 (7th Cir. 2014).
\item \textsuperscript{250} Leung, \textit{supra} note 9, at 533–34, 538–39.
\item \textsuperscript{251} \textit{Id.}
\item \textsuperscript{252} \textit{Id.} at 538–39.
\item \textsuperscript{253} \textit{Id.}
\end{enumerate}
\end{footnotesize}
Finally, Congress had to consider the impact these statutes would have on vessel owners. These parties would bear the costs of training personnel to engage in ballast water exchange and equipping ships with the necessary systems to comply with the regulations. These requirements were estimated to cost between one hundred thousand and one million dollars.\textsuperscript{254} Nor were they one-off expenditures. The ballast pumps increase ships’ expenditures by consuming additional fuel, and by increasing travel time if the vessel has to travel off-course to reach a ballast water exchange zone.\textsuperscript{255} The requirements also raise safety concerns since the vessel could lose stability during the course of the exchange.\textsuperscript{256}

Congress and the agencies were able to adequately identify and balance all of these interests when developing a strategy to curtail zebra mussel introduction because they had access to the various agencies’ expertise. After promulgating an unenforceable voluntary policy, the Coast Guard eventually implemented regulations that would effectively prevent the introduction of invasive species into the Great Lakes via ballast waters.\textsuperscript{257}

2. Accounting for Nonpecuniary Interests

Both NANPCA and NISA expressly sought to understand and minimize the adverse economic and ecological impacts of zebra mussels in native ecosystems.\textsuperscript{258} Indeed, NANPCA and NISA mandated studies regarding the effects of ballast water on native species and ecosystems throughout the nation and the methods of ameliorating these effects.\textsuperscript{259} NISA broadened the scope of NANPCA to control the adverse effects that invasive species were having on other native ecosystems.\textsuperscript{260} This was based in part on its “expanded finding that nonindigenous species may compete with or prey upon native species of plants, fish, and wildlife, and may carry diseases or parasites that affect native species.”\textsuperscript{261} Thus, the statutes accounted for both ecological and nonpecuniary interests. Furthermore, Congress had access to experts who were properly able to assess these interests. While judges applying the public nuisance doctrine are limited to considering only proprietary interests, Congress does not have these

\textsuperscript{255} Id.
\textsuperscript{257} Browning, supra note 232, at 333–34.
\textsuperscript{258} Leung, supra note 9, at 531, 533.
\textsuperscript{259} Id.
\textsuperscript{260} Id.
\textsuperscript{261} Id. at 533.
same limitations, and its main purpose is to represent and serve the public’s interests.

3. Familiarity

The major benefit of administrative action is the agencies’ broad range of expertise. The Task Force was composed of members from all of the interested agencies. Because invasive species inevitably implicate a myriad of interests, this broad range of expertise is a necessary component of an effective response. For example, environmental experts may underestimate the economic impacts of a regulation and vice versa. Thus, an appropriate policy response would be based on accurate evaluations of all of these interests.

E. Substantive Policy Considerations

While agencies do have expertise and familiarity with a broad range of interests, this subpart will evaluate whether they can translate this knowledge into an enforceable policy. Such a policy must be able to adequately prevent future injuries and remedy past injuries, allocate costs of preventing the nuisance and compensating victims to the responsible parties, provide a means of recourse for victims if the implemented policy is ineffective or counterproductive, and should be broadly applicable to a diverse range of invasive species threats, instead of being limited by species or region.

1. Preventing Future Injuries and Remedy Past Injuries

Federal regulation is limited in its ability to prevent future harms. Scholars have argued that agency regulation is an inadequate means of responding to invasive species because “most agency actions are reactive: long after a species has become established, the agency takes action.” NANPCA and NISA have also been criticized for their inability to prevent future introductions of invasive species given the unenforceability of the regulations and funding restrictions. Thus, the legislative and executive branches are limited in their ability to respond effectively to potential threats.

NISA was chiefly criticized for creating loopholes that rendered the ballast water exchange requirement unenforceable. Specifically, section 4711(k) provided a safety exemption to this requirement in “extraordinary

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263. Eldridge, supra note 199, at 53–54.
264. Biber, supra note 125, at 396.
265. Wade, supra note 244, at 365.
266. Eldridge, supra note 199, at 55.
267. Id. at 56.
circumstances.” Unfortunately, “extraordinary circumstances” encompassed any factor determined by the captain as affecting safety, from inexperienced crewmembers to vessel design. This was especially problematic because under section 4711(k)(2), vessels unable to exchange ballast water outside America’s territorial waters were allowed to discharge it into any port besides the Great Lakes. Moreover, although ships were required to provide reports of their exchange or reasons for claiming exemption, the Coast Guard did not enter these reports into a database prior to 2003; meaning the frequency with which this exemption was invoked prior to 2003 is unknown.

Vessels that arrive fully loaded with cargo, and thus do not need ballast water, were also exempt from the exchange requirement even though water is pumped in and out of these tanks in the port before new cargo is placed onboard. A ballast water tank sampling conducted by the National Oceanic and Atmospheric Administration found that such ships carry billions of live organisms into the Great Lakes basin each year.

Eventually, mandatory regulations issued by the Coast Guard closed many of these loopholes. The new rules made compliance with the ballast water exchange program mandatory, with violations risking felony charges and carrying civil penalties of up to $27,500 per day. They also narrowed the scope of the safety exemption, enforcing strict recording and reporting of the reasons that prevented a vessel from complying with the regulations.

Still, for two reasons, even the new mandatory rules do not represent a fully effective safeguard against invasive species for two reasons. First, the standards that vessels have to comply with may not preclude invasive species release into the ports. The standards require that after the exchange of fresh water from the port of origin with saline water from beyond the exclusive economic zone, the ballast water is at least thirty parts per thousand salt, based on the assumption that to achieve this salinity, a vessel would have to exchange 85 percent of its ballast waters. The standard assumes that an 85 percent

268. Id. at 57.
269. Zellmer, supra note 232, at 1239.
270. Id.; Eldridge, supra note 199, at 58.
271. Applegate, supra note 218, at 396.
272. Id. In response to petitions from the Great Lakes states, the Coast Guard implemented a voluntary Ballast Water Management Program, which involved filling fully loaded vessels’ ballast tanks with ocean water and then flushing the mixture out of the tanks to clear them of any live invasive freshwater species. Browning, supra note 232, at 333. Yet because this program was voluntary, few vessel operators, if any, complied given the costs of doing so. Id.
274. Browning, supra note 232, at 333.
275. Id. at 334.
276. Zellmer, supra note 232, at 1239.
277. Id.
exchange is enough to flush out invasive species. Enforcement is also constrained by funding shortfalls. In 1995, Congress earmarked $29,325,000 for implementing NANPCA in its final year. In 1997 Congress earmarked only $28,425,000 for implementing NISA. The apparent funding consistency is an illusion. All of NANPCA funding was dedicated to regulating vessels entering the Great Lakes, while the NISA funding was dispersed across the nation. Thus, the agencies had limited success in preventing future harm because their regulations were initially unenforceable. Neither act considers compensating victims harmed by the zebra mussels before the statutes were enacted.

2. Allocation of Costs to Responsible Parties

NANPCA and NISA allocated the costs of complying with ballast water exchange regulations to the shipping industry, while the federal government bore the administrative costs of regulation and enforcement. Under this scheme, the shipping industry shouldered about 99 percent of the costs associated with ballast water regulation to prevent the introduction of invasive species. These costs translate into approximately $10,000 per ship annually. As discussed in the previous subpart, Congress earmarked billions of dollars to implement the acts. Furthermore, the Coast Guard had to dedicate both personnel and finances to enforcing these regulations. This included establishing exchange zones, monitoring vessels that entered the ports, and maintaining records, among other tasks. Finally, none of the costs of regulation are imposed on the victims of environmental harms.

3. Finality of the Decision

As the modifications to NANPCA and NISA rules indicate, agency regulations can be amended if the agency finds the rules to be ineffective.

278. Id. The salinity test also does not account for the salinity of the ports of origin. For instance, ports in the Mediterranean Sea have a higher average salinity than the Atlantic Ocean. Id. Thus vessels can pass the salinity test without complying with the regulations. Id. Also, evaporation during the voyage will increase saline concentration in the ballast tank. Id. As a result, the salinity test may not provide an accurate indication of whether an 85 percent exchange has occurred. Id.
279. Eldridge, supra note 199, at 58.
280. Id.
281. Id. at 58–59. Additionally, the House Appropriations Committee allocated $1,192,000 for aquatic nuisance prevention and control. Id. at 58. This was the same figure allocated in 1996, but a further $2.8 million was removed from the federal zebra mussel budget in 1998. Id.
282. Zellmer, supra note 232, at 1239.
283. See INT’L MAR. ORG., supra note 254, at 18.
284. Id.
285. Id.
286. Eldridge, supra note 199, at 58.
Yet this must be done in accordance with the Administrative Procedure Act’s (APA) notice and comment requirements, which raises some concerns. Analysis suggests that agencies are unlikely to amend their rules because the informal rule making process “is so heavily laden with additional procedures, analytical requirements, and external review mechanisms.” This theory is known as ossification and suggests that once an agency has shouldered the costs of issuing a rule, “it has every incentive to leave well enough alone.” Thus, “even when forced by statute to revisit existing rules, an agency is very reluctant to change them.” However, there are alternatives. Indeed, agencies are more frequently employing “nonrule rulemaking” to establish rules through adjudication or less formal devices such as policy statements, interpretative rules, or manuals. Thus, agencies have the authority to amend or alter rules slightly through less formal means to more effectively enforce the statute without reinitiating the rule making process under the APA.

4. Potential for Broad Application to Invasive Species

Beyond enforceability concerns, NANPCA and NISA have also been criticized for their limited scope since they are species and region specific. While NISA did extend to more species and was national in scope, its mandated requirements for ballast water exchange were limited to vessels entering specific ports. These requirements were voluntary in other regions. Furthermore, the factors that make NISA ineffective on a limited scope will also render it ineffective when broadly applied.

More generally, in drafting NANPCA and NISA Congress identified and addressed a particular type of aquatic invasive species and attempted to regulate the source of that species’ introduction. Thus, the Acts’ specific regulations will only affect other aquatic species that are dispersed via ballast waters. However, the institutional approach of identifying invasive species and regulating their source could be extrapolated to other invasive species.

289. Id. at 1386.
290. Id. at 1386, 1390.
291. Id. at 1390.
292. Id. at 1393.
293. Id.
294. Zellmer, supra note 232, at 1238.
295. Id.
296. Id.
297. Biber, supra note 125, at 403.
298. Dentler, supra note 226, at 218.
VIII. WHICH BRANCH OF GOVERNMENT IS BEST SUITATED TO RESPOND TO THE INVASIVE SPECIES THREAT?

This Note has assessed the adequacies and deficiencies of policies promulgated by courts and administrative agencies in responding to the invasive species threat. This Part considers which system is better suited to respond to the Asian carp threat and, in turn, whether the Seventh Circuit was correct in deferring to agencies in the Asian Carp litigation.299

A. Procedural Considerations

To determine which system presents a more effective process of promulgating invasive species policies, this Note considered two factors: first, the requirements necessary to catalyze policy development and second, the efficiency, relating to both the timeliness and cost, of developing and implementing a policy.

Congress was able to enact legislation at the first sign of significant environmental harm. It passed the first statute within a year of recognizing the substantial harm that zebra mussels were causing to target the source of the introduction. It acted quickly based on the evidence of damage and predictions of future harm by U.S. Fish and Wildlife.300 Furthermore, Congress was able to enact this legislation and authorize the agencies to promulgate regulations without imposing transaction costs on the victims of the nuisance or requiring them to initiate legal action. In fairness, while Congress enacted legislation promptly, efficient policy implementation was compromised by administrative delays, and the rules had to be amended before they adequately responded to the threat.301 In contrast, courts have denied injunctive relief despite recognizing the gravity of the threat posed by the Asian carp to the ecosystems and economies of the Great Lakes region.302 Thus, when compared to judicial action, which did not provide a solution after four years of litigation, administrative procedure is still more responsive to invasive species threats than the public nuisance doctrine.

B. Access to Expertise

It is vital that environmental policies be based on expertise in several fields because ecosystems and economies are extremely sensitive and any policy chosen will implicate various interests across broad segments of society. In assessing each system’s access to expertise, this Note considered three factors. First, the system’s ability to balance the implicated interests; second,
the system’s ability to account for nonpecuniary interests; and third, the system’s familiarity with the threat and the implicated interests.

The administrative system’s access to expertise is unparalleled. The Task Force was able to utilize the expertise of other agencies, including foreign policy experts, economic experts, ecological experts, and security/logistical experts in developing policies to respond to the invasive species. Given their access to expertise and familiarity with the implicated interests, the agency was able to weigh all of the interests that Congress authorized them to consider in promulgating a policy to prevent the introduction of invasive species. When presented with an analogous situation, the court stated that it was not in a position to conduct this balancing test and deferred to the agency.

Furthermore, because the systems are designed to serve different purposes, administrative agencies are better suited to account for nonpecuniary interests. This is because the public nuisance doctrine is meant to protect the public’s property rights and is limited to economic value assessments, while Congress can enact legislation to serve the public interest. Thus, administrative agencies are better situated to develop invasive species policies given their access to expertise and freedom to consider nonpecuniary interests.

C. Substantive Policy Considerations

This Note considered four factors that are relevant to assessing the substance of a policy. These factors are: (1) the policy’s ability to prevent future harms and remedy past injuries; (2) the policy’s ability to allocate costs to the responsible parties; (3) the policy’s ability to provide recourse for victims if the policy did not adequately respond to the invasive species; and (4) the policy’s potential for broad application.

Administrative agencies are better suited to prevent future harms while courts are better suited to remedy past injuries. While NANPCA and NISA focused on preventing further introduction and dispersion of zebra mussels, they did not compensate parties who were injured by the zebra mussels for their losses. By contrast, though courts are reluctant to grant preliminary injunctions against anticipated nuisances, they have more flexibility to compensate victims for their economic losses under the public nuisance doctrine.303

Administrative action properly imposes compliance costs on the responsible parties, while judicial action presumes compliance from responsible parties. In agency action, the federal government bears the costs of developing and enforcing such regulations. On the other hand, if injunctions were broadly applied, the threat of liability would allocate the costs of both developing and implementing policies on the responsible parties. However, this will only occur if parties fear public nuisance liability. Decisions such as Asian Carp, which demonstrates that the courts are unwilling to order injunctive

303. DOREMUS ET AL., supra note 61, at 44, 56–57.
relief, undermine the credibility of this threat. Furthermore, under the federal common law public nuisance doctrine, the victims of environmental harms have to bear the litigation and transaction costs of initiating legal action.

Administrative action provides greater opportunity for recourse than the public nuisance doctrine. If regulations are ineffective, in theory, parties can petition the agency to amend the regulations, pursuant to APA requirements, and agencies can rectify the inadequacies. Agencies can change rules but, in practice, due to ossification, agencies usually try to avoid altering rules and amending regulations can take a long time. By contrast, while public nuisance decisions can be appealed, parties will often be subject to the discretion of the same jurisdiction and will have to bear the litigation costs of appealing a decision.

While neither system successfully produced a broadly applicable policy to combat harm from invasive species, the legislative system has greater potential to do so. Under the public nuisance doctrine, each invasive species in each region will have to be evaluated on a case-by-case basis. Meanwhile, Congress simply had to reauthorize NANPCA as NISA to expand the policy’s application to other species and geographic regions. While the effectiveness of this expansion is questionable, it still demonstrates that administrative action has greater institutional capacity to develop a broadly applicable policy.

Based on these evaluations, this Note concludes that administrative agencies are better suited to develop policies that are substantively more responsive to invasive species threats.

CONCLUSION

The Seventh Circuit was correct in its assessment that agencies are better suited, in both procedural and substantive bases, to develop and implement a policy to prevent the Asian carp from entering Lake Michigan. Thus the courts’ deference to agencies was appropriate. However, the plaintiffs pursued legal action against the agencies because agency action thus far had not prevented the migration of the Asian carp. While the court acknowledged that the plaintiffs could bring their public nuisance claim again if the agencies slackened their preventive efforts, the court should have taken the opportunity to order the agencies to take action based on its expertise to prevent the spread of the Asian carp and to do so within a specified time frame.

Thus, the invasive species problem fits into a broader discussion of judicial review of agency inaction and agency delay. The Supreme Court grappled with a similar question in Massachusetts v. EPA. There, the Court remanded the agency’s decision not to regulate greenhouse gases back to the agency. In other words, the Court did not try to develop policy itself, but

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insisted that the agency was statutorily required to develop such a policy.\textsuperscript{305} However, the issue is more convoluted here because the Corps does not have a congressionally imposed “clear duty” to implement hydrological separation to prevent the spread of the Asian carp, and the agency has already taken actions to prevent the harm.\textsuperscript{306}

In 2012, Congress passed the Moving Ahead for Progress Act, which ordered the Corps to address the possibility of hydrological separation and authorized it to proceed directly to preconstruction engineering and design if the Secretary of the Army finds that the completed study shows that a project is justified.\textsuperscript{307} The Seventh Circuit explained that it cannot use the federal common law public nuisance doctrine to control Congress by ordering the Corps to take an action.\textsuperscript{308} However, the court stated that if there is evidence that the agency is stalling in its consideration of the project, the plaintiffs could bring a claim under the APA, alleging that the agency is “unreasonably delayed” in implementing a policy and the court could compel it to engage in rule making.\textsuperscript{309}

If this case appears before the court again, the precedent established in \textit{Massachusetts v. EPA} should govern this case. First, Congress is likely to notice such judicial actions and thus may have a stronger incentive to legislate the issue. Scholars have suggested that “court decisions can inspire effective policy solutions.”\textsuperscript{310} Such a path forward will still respect the separation of powers between the federal branches, because the courts will not be forcing Congress’s hand one way or another. Rather it will be signaling to the legislative and executive branches that they need to take actions as they see fit. Second, if \textit{Massachusetts v. EPA} was one of the first cases to suggest that states could bring suit against agencies for failing to carry out their statutory duties, \textit{Asian Carp} is one of the first to say that states can seek injunctive relief for nuisance caused by agency inaction.\textsuperscript{311} Scholars and practitioners note “litigation that seeks to force agency action will continue to be an increasingly important determinant of the shape and scope of environmental regulatory policy in the United States.”\textsuperscript{312}

\begin{itemize}
  \item \textsuperscript{305} Eric Biber, \textit{Two Sides of the Same Coin: Judicial Review of Administrative Agency Action and Inaction}, 26 \textit{VA. ENVT. L.J.} 461, 463 (2008).
  \item \textsuperscript{306} Id. at 465.
  \item \textsuperscript{307} \textit{Asian Carp IV}, 758 F.3d at 898.
  \item \textsuperscript{308} See id. at 906-07.
  \item \textsuperscript{309} Administrative Procedure Act, 5 U.S.C. § 706(1) (2012) (“[Courts may] compel agency action unlawfully withheld or unreasonably delayed . . . .”).
  \item \textsuperscript{310} Pidot, \textit{supra} note 141, at 223.
  \item \textsuperscript{311} Biber, \textit{supra} note 304, at 63
  \item \textsuperscript{312} Biber, \textit{supra} note 305, at 503.
\end{itemize}
APPENDIX 1\textsuperscript{313}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{electric_barriers.png}
\end{figure}

APPENDIX 2\textsuperscript{314}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{uses_of_caws.png}
\caption{Uses and Users of the CAWS include:}
\end{figure}


\textsuperscript{314} Image credit to the U.S. Army Corps of Engineers.

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