

# Too Little, Too Late: A History of Invasive Species Laws

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## Background

The history of laws to control invasive species in the United States is a history of laws that came too late. For example, in 1899 the U.S. Congress passed a law funding the removal of water hyacinths, an invasive plant that Congress described as “menacing the safety of any vessel” after finding it growing into dense mats blocking rivers and hiding logs and other hazards. And in 1900 Congress passed the Lacey Act, making it illegal to import starlings, English sparrows, and other “injurious” species not native to the United States,<sup>1</sup> describing the sparrows as the “rat of the air,” that vermin of the atmosphere” because of the harm they already caused. Yet in 2020 these species – water hyacinths, starlings, and English sparrows – are rampant in the United States. In other words, the laws did not work. In fact, in 1960 when amending the Lacey Act regarding injurious species, Congress eliminated references to the sparrow and starling, conceding the loss to the birds: “We believe . . . . No feasible means for controlling their numbers or range has been devised.”<sup>2</sup>

That did not prevent Congress from trying to stop invasives by passing laws to prevent their introduction. However, most laws came *after* significant harm from a non-native species: building a fort after the invasion.

Invasive species, also referred to as exotic, non-native, injurious, or noxious species, are ones that do not naturally occur in the environment, and because they do not have natural enemies, such as insects or larger predators, invasives thrive and outcompete the native species. Invasives come from a different environment, not necessarily a foreign one. For example, the red swamp crayfish is native to Mississippi but is an invasive in California. Once an invasive is established (meaning it reproduces and does not require cultivation) a law prohibiting its introduction will not work. The fact is, at best, laws can limit intentional imports of potential invasives, and then only if enacted prior to the first import and effectively enforced.

However, laws that restrict intentional imports have little effect on species that show up as hitchhikers. Unintentional introductions have produced some of the United States’ biggest invaders. Besides zebra mussels (and their cohort, quagga mussels), other accidental imports include the Asian longhorned beetle, tumbleweed, and hemlock woolly adelgid. A great number of invasives were accidentally introduced after being imported for other purposes (e.g., agriculture, gardens, aquaculture, aquariums, or pets), such as the water hyacinth, the European water chestnut, kudzu, the snakehead fish, Asian carp, Burmese pythons, lionfish, and parrotweed. But the harm from each of those species was identified and addressed in law only after they were established. Sometimes long after they were established. The laws tried to prevent additional imports of an already thriving nuisance.

## Ailanthus Trees

Perhaps one of the first invasive species laws was in 1853, within an appropriations act. It includes a line authorizing funds to plant trees on federal property but says “Provided: That no more ailanthus [sic] trees be purchased or planted.”<sup>3</sup> The restrictions of 1853 came too late. The so-called Tree of Heaven was a beautiful exotic species for gardens, reportedly imported as early as 1784. Like any good invasive, the ailanthus sprang free from its borders and now occurs throughout most of the United States, including sprouting from gutters and sidewalk grates in New York City. When Betty Smith wrote *A Tree Grows in Brooklyn*, she was writing about the resilient ailanthus, which will re-sprout, even when chopped down – a tenacity admirable in humans, but annoying in plants that choke out native species. However heavenly, the tree is an outlaw in the United States. There is [still a law](#) preventing planting ailanthus on public property.

## Zebra Mussels

More recently, in 1990 when faced with an invasive mollusk, the zebra mussel, Congress passed the National Aquatic Nuisance Prevention and Control Act (NANPCA). This law set up a task force to study the invasion, and listed the zebra mussel as an injurious species under the Lacey Act.<sup>4</sup> Congress passed the law after finding that ships' discharge of ballast water led to the "unintentional introduction of nonindigenous species" into the Great Lakes. The zebra mussel was discharged from ballast water gathered in Europe. Zebra mussels clog water pipes, out-compete native mussels, and eat all the edible material from mollusk's food chain. At the time of passing NANPCA, Congress estimated the economic cost of zebra mussels as reaching \$5 billion by 2000, not taking into account the lost biodiversity. [The U.S. State Department](#) anticipated the costs to control zebra mussels from 2000 to 2009 to be \$3.1 billion, and that it would cause the extinction of up to 140 native mussel species.



Credit: D.Jude, University of Michigan

NANPCA did more than just bar intentional importing of zebra mussels, but it was not a quick response. The law required the Coast Guard to produce regulations within two years for environmentally sound alternative ballast water management or ballast water exchanges in the Great Lakes. The Coast Guard published a final rule in the Federal Register in 1993, "[Ballast Water Management for Vessels](#)

[Entering the Great Lakes.](#)" On December 30, 1994, the Coast Guard published another final rule, "[Ballast Water Management for Vessels Entering the Hudson River.](#)"

During that time, another invasive – the quagga mussel – was first sighted. In 1991 it was identified in New York; in 1992 the quagga was in Ohio; in 1994, Pennsylvania. As of January 2020, according to the U.S. Geological Survey (USGS), [it is found in 17 states](#), including landlocked states Iowa, Kentucky, Nevada, South Dakota and Utah, meaning these species are spreading by hitchhiking on domestic recreational boats and trailers, not just hiding in ballast water.

In 1996 Congress amended the act to require the Coast Guard to issue mandatory regulations to control ballast water, under the National Invasive Species Act (NISA). In 2004 the Coast Guard enacted final regulations to require ballast water exchanges in deep water to prevent carrying the species in. Note that this is 14 years after the initial law identifying zebra mussels as a costly problem. Additionally, in discussing the [regulatory revisions in 2012](#), the Coast Guard found ballast water exchanges (BWE) were not preventing unintentional non-natives from arriving, having an efficacy rate between 50 and 90 percent. According to the Coast Guard "BWE is not well-suited as the basis for the protective [ballast water management] programmatic regimen envisioned by NISA, even though it has been a useful interim management practice and was a logical place to start." In 2018 Congress tried again, this time by amending how ballast water is regulated in the Vessel Incidental Discharge Act ([P.L. 115-282](#), §§ 902-203).

## Asian Carp

Not all creatures sneak in. Some species are imported into the United States for an intended purpose. One example is Asian carp (including bighead, silver, black, and grass carp), which in the 1960s were introduced into the United States to control algae in catfish farms and reservoirs in the mid-South. It did not take long for them to escape and spread up the Mississippi River and into 23 states, [according to the USGS](#). They are bigger than native carp and eat everything, reducing resources for native fish. Congress reacted, but decades later.

In 2009 Congress passed the Asian Carp Prevention and Control Act (P.L. 111-307). That act amends the Lacey Act to add bighead carp to the list of injurious species, forbidding their import. Once again, the ban on importing the carp occurred too late, over 30 years after

they were first imported, and long past the date when the greatest risk of carp introductions was due to importing. The law is also too limited, applying only to bighead and silver carp, and not black or grass carp.

At the time the Asian carp law was enacted, the Lacey Act was interpreted as applying not just to imports, but to interstate shipments. Therefore, adding carp to the Lacey Act would limit some potential additional introductions from state to state. However, in 2017 the D.C. Circuit Court of Appeals found that interpretation was not consistent with the plain language of the Lacey Act, and that shipments among the 49 states within North America were not controlled by the act.<sup>5</sup> Thus, the Asian Carp Prevention and Control Act is interpreted to prevent only the continued import of bighead and silver carp, not the interstate transportation of those fish.

Grass carp, introduced in Arkansas in 1963, are controlled not by import restrictions but by biological ones. Grass carp are very useful to control aquatic vegetation and are still stocked in reservoirs and catfish ponds. But generally, those fish must be triploid, meaning they have an extra set of chromosomes to make them sterile. Mississippi does not have such a restriction on grass carp. While Mississippi prohibits stocking or releasing nonnative aquatic species into a “private or public pond, lake, stream, river or any other water body” it allows the release of grass carp.<sup>6</sup> Additionally, Mississippi allows aquaculture of “non-native carp species” so long as it is “conducted in a Responsible manner that excludes the possibility of escape,” further stating that screens over drainpipes of a size to prevent the escape of fingerlings was adequate.<sup>7</sup> In contrast, aquaculture of tilapia in Mississippi (another non-native) requires use of a 1000-micron mesh screen to prevent discharge of water containing eggs or fish; and aquaculture facilities for other non-native species must “prevent the passage of eggs, larvae, juveniles and adults.”<sup>8</sup>

[The State of Alabama prohibits possession, sale, or release](#) of Asian carp, but defining that only to include bighead, silver, and largescale silver, thus excluding black carp and grass carp. However, Alabama has used regulations to help remove invasive species to some extent, by [allowing the harvest of Asian carp](#) at the Gunter Reservoir without gear restrictions. That regulation also prohibits the release of bighead, silver, or black carps back into the reservoir.

## Tumbleweed

An invasive species does not have to be aquatic to sneak in and be harmful. In fact, tumbleweed – a symbol of the arid West – is an invasive, thought to have been unintentionally imported in the 1870s in bags of seed.<sup>9</sup> It took to its new habitat, and took over, scattering 250,000 seeds per plant as it rolls along. It thrives in places where native plants are gone, such as cultivated fields and rights-of-way along roads. In two decades it rolled from South Dakota, where it was first reported, to the Pacific Coast more than 1,000 miles away.



Credit: Jim Choate

In 1939 – sixty years later – Congress passed the Federal Seed Act making it unlawful to transport agricultural seeds unless they are labeled with the origin and percentage by weight of weed seeds (including noxious-weed seeds), the kinds of noxious-weed seeds, and the rate of occurrence of each. This law was amended, and [a form of it](#) requires the U.S. Department of Agriculture to control plant pests and noxious weeds.

While this law may have prevented some additional introductions of invasive plants, it did not prevent the spread of tumbleweed. In 2020 the State of Washington had a [state highway closed](#) for 10 hours due to tumbleweed accumulations of up to 30 feet. Also, a [hybrid tumbleweed](#) blending the genes of two invasive tumbleweeds, one from Russian and China with a species from Australia and South Africa, was first reported in the early 2000s, and grows up to 6-feet tall.





Credit: Ken Ratcliff

### Kudzu

Another example of a non-aquatic nuisance plant, but one found in the South, is kudzu. It was intentionally introduced, and even distributed, by the U.S. Department of Agriculture to southern landowners to fight off erosion caused by poor agricultural practices. An estimated 85 million seedlings were handed out beginning in 1933.<sup>10</sup> Congress even ordered planting it on a military base: “upon the completion of such leveling, draining, and fertilizing, to plant kudzu crowns on such area at the rate of five hundred to the acre.”<sup>11</sup> The Alabama Cooperative Extension Service estimates that 7 million acres are infested with kudzu in the Southeast. Getting rid of it is difficult, [according to that group](#): “Eradication, not merely population reduction, is essential for permanent control.”

In 1997 Congress added kudzu to the list of pernicious weeds under the Federal Noxious Weed Act of 1974.<sup>12</sup>

### Lionfish

Animals in the pet trade also take a toll on the United States’ natural resources once they get free. For example, lionfish, an eye-catching aquarium fish, were first noticed in the late 1990s along the Atlantic Coast and now plague the Gulf of Mexico, too. They eat small crustaceans, other fish, including fish larvae, but have no predators in U.S. waters because they are native to the Indian and Pacific oceans. One theory of how they came

to the United States’ waters is that aquarium owners released the fish when they got tired of them. Another is that hurricane waters overwhelmed tanks in which they were grown. Thus, legal efforts to prevent the introduction of lionfish would have been effective only if the laws had prevented importing any lionfish in the first place. Releasing aquarium fish into the wild is a violation of state law that people are willing to break and that may be impossible to enforce (both Alabama and Mississippi have such laws, see below).

No federal law or regulation has been found regarding the fish. However, the State of Florida took action, including enacting [regulations](#) in 2018 to prohibit import, breeding, or possession of lionfish eggs or larvae. However, the state still allows the sale of live lionfish if they were harvested from Florida waters or adjacent federal waters. In 2011 Florida began developing regulations to encourage catching lionfish, and in 2014 [eliminated some regulatory obstacles](#) to volunteer divers wishing to harvest the fish. Divers no longer need a recreational saltwater fishing license if using approved or lionfish-specific gear, and the regulations eliminated recreational fishing limits for that fish. In federal waters, a federal permit is still required. While lionfish are said to be delicious if prepared without introducing venom from the spines into the flesh, it seems unlikely that diners can catch up to the 2,000,000 or so eggs laid by mature lionfish each year.

### State Efforts in Alabama and Mississippi

Alabama and Mississippi have laws prohibiting the introduction of non-native species into state waters. But the laws only are for intentional introductions. [Mississippi law](#) makes it illegal to “release or cause to be released into any public waters any aquatic species” and also to release any animal not indigenous to the state. [Alabama law](#), for example, makes it a misdemeanor for any person to “introduce[], place[], or cause[] to be introduced or placed, any nonindigenous aquatic plant into any public waters...” But the law continues to say that “the unintentional adherence to a boat or boat trailer of a nonindigenous aquatic plant, and its subsequent unintentional transportation or dispersal in the course of common and ordinary boating activities and practices, does not constitute a violation.”

However, unintentional, careless transportation is exactly how many of these species are spread. Aquatic nuisance plants, for example, common and giant salvinia (sometimes called water spangles, floating fern, or Kariba weed), do not need to be uprooted and replanted to flourish. They can grow from a single shred. The weed is found in 16 counties in Alabama and at least five in Mississippi.<sup>13</sup> The weed chokes out native plants and also can make waters uninhabitable for fish and waterfowl.

Closing the intrastate transportation gap in the regulatory structure could make a difference by limiting the harm from lake to lake transfers. For example, other states require boaters to rinse their craft and related equipment.<sup>14</sup> [Minnesota](#) requires boaters to clean all visible plants and invasive species from watercraft, trailers, and related equipment before leaving the area; to drain the equipment, including bilge, livewell, and baitwell; keep the drain plugs out while transporting; and to dispose of unwanted bait in the trash, not into the waterbody. [Connecticut](#) requires removing and disposing of any vegetation and aquatic invasive species on boats.

Another, less effective way to reduce the number of invasive carp, would be to open fishing. This could be a program similar to the one Florida has allowing lionfish harvests. Both Alabama and Mississippi could allow recreational harvest of invasive carp without a license, and without limits on gear.

### Conclusion

The legal history of trying to control invasive species demonstrates that banning species after they have been

introduced is futile. For intentional imports there could be a requirement that only sterile species may be imported absent an assessment of the potential damage caused by a release. Such a rule could make importing difficult, but there are already noises to require eDNA testing at ports of entry. And the temporary inconvenience of testing could prevent millions of dollars of damages.

To have any impact, laws and regulations must include the authority for removal of species. Even so, as demonstrated by the 1899 law to remove water hyacinth from one river, the results are likely to be temporary. However, while there is no fix, there may be control. That would be accomplished by timely regulations that authorized swift removal/eradication efforts without waiting decades to respond. 🦋

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### Endnotes

1. 31 Stat. 188, as amended; 18 U.S.C. § 42.
2. S. Rpt. 86-1883, Importation of Injurious Mammals, Etc., Committee on the Judiciary (Aug. 20, 1960).
3. 10 Stat. 207 (March 3, 1853).
4. 16 U.S.C. §§ 4701 et seq.; 56 Fed. Reg. 56942 (Nov. 7, 1991).
5. U.S. Association of Reptile Keepers, Inc. v. Zinke, 852 F.3d 1131 (D.C. Cir. 2017).
6. Miss. Admin. Code 40-3:1.1.D.
7. Miss. Admin. Code 2-1-4:11(105.01).
8. Miss. Admin. Code 2-1-4:11(105.02) (tilapia); Miss. Admin. Code 2-1-4:11(105.03) (all other non-native species).
9. DesertUSA, *Tumbleweed: Russian Thistle*.
10. Alabama Cooperative Extension System, *Kudzu in Alabama: History, Uses, and Control* (ANR-65) p. 2.
11. P.L. 81-496, 64 Stat. 96 § 6.
12. P.L. 105-86, 111 Stat. 2079, § 728.
13. Alabama Herbarium Consortium and the University of West Alabama, [Alabama Plant Atlas](#); Mississippi Dep’t of Wildlife Fish and Parks News, *Officials concerned as Giant Salvinia spreads to more lakes* (March 4, 2019). [Introduced in the late 1970s as a garden species.](#)
14. For more information on state regulations requiring removal of species from boats before transport, see Stephanie Showalter Otts, *From Theory to Practice: A Comparison of State Watercraft Inspection and Decontamination Programs to the Model Legal Framework* (Rev’d Dec. 2018).