

AIS in E-Commerce Background Document

I. Executive Summary

Invasive species are a large, complex problem that cost the United States billions of dollars each year in damages and negatively impact natural systems. The federal and state governments utilize a network of laws to address the introduction and spread of invasive species, creating an interconnected web of legislation and regulation. Unfortunately, these laws are not currently succeeding in their effort to restrict the movement of invasive species.

Although sellers/shippers have a duty not to ship illegal invasive species, transporters have a duty to report any violations of invasive species laws they discover, and consumers have a duty not to purchase, own, or possess prohibited species, there are multiple barriers to enforcing and meeting those duties. These barriers include, but are not limited to, inconsistencies among state laws, lack of guidance under federal law regarding the transport of invasive species as well as monitoring and compliance mechanisms to prohibit illegal commercial activity, and a lack of resources to enforce the existing laws and penalize those involved in the commerce of prohibited species. Although it is impossible to eliminate the e-commerce of invasive species entirely, certain measures may help lessen the regulatory gaps and thus reduce the costs to the U.S. of invasive species. This background issue paper was developed to provide an overview of the current state of the law and challenges to enforcement to inform discussions at the upcoming virtual summit on “Aquatic Invasive Species in Commerce” on March 8, 2023. This paper is designed to be background and supplemental information for the Summit, rather than an exhaustive report on all aspects of AIS in E-Commerce.

II. Introduction

a. Invasive species

An invasive species is defined as “an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health”; alien species means “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.”¹ “Invasive” is a subcategory of a broader classification of “non-native” species, which can include species that are alien to an ecosystem but either do not cause harm or benefit the ecosystem in some way. Because the definition of invasive species only includes those non-native species which cause or are likely to cause harm, introduction of invasive species inherently has associated costs. The recorded total cost in the United States of introduction of invasive species ranges greatly, from \$21.08 billion a year² to \$123 billion per year.³ These costs include those associated with implementing prevention programs, creating early detection and rapid response programs, conducting control and management activities, holding outreach campaigns and restoration programs, as well as agriculture revenue losses and decreases in property values.⁴

Invasive species may be terrestrial or aquatic. Aquatic invasive species (AIS) are simply invasive species of plants or animals that rely on water for at least one stage of their lives.⁵ The term “aquatic invasive species” is interchangeable with “aquatic nuisance species”, a term frequently used by states; for consistency, the term aquatic invasive species will be used.⁶ AIS

¹Executive Order 13112 on Invasive Species (64 Federal Register 6183, February 8, 1999).

²Jean E. Fantle-Lepczyk et al., *Economic Costs of Biological Invasions in the United States*, 806 SCIENCE OF THE TOTAL ENVIRONMENT 151318 (2022).

³What Is an Aquatic Invasive Species?, U.S. FISH AND WILDLIFE SERVICE (2021), <https://www.fws.gov/story/what-aquatic-invasive-species> (last visited Jan. 20, 2023).

⁴Report State Action on Invasive Species, NATIONAL CONFERENCE OF STATE LEGISLATURES (2016), <https://www.ncsl.org/environment-and-natural-resources/state-action-on-invasive-species> (last visited Jan. 23, 2023).

⁵What Is an Aquatic Invasive Species?, U.S. FISH AND WILDLIFE SERVICE (2021), <https://www.fws.gov/story/what-aquatic-invasive-species> (last visited Jan. 20, 2023).

⁶See Protecting Our Great Lakes: Ballast Water and the Impact of Invasive Species: Hearing Before the Subcomm. on Regulatory Affairs, H. Comm. on Government Reform, 109th Cong. 26 (2005) (statement of Mike Cox, Att'y Gen., State of Michigan), available at <http://bulk.resource.org/gpo.gov/hearings/109h/24893.pdf>.

are of particular concern because they are easy to introduce, hard to spot, and difficult to eradicate once they have been introduced to a new ecosystem. The mechanisms by which invasive species spread are called “vectors”, and include boats (recreational and commercial), diving gear, drilling platforms, dry docks, the aquarium industry and other industries that grow and sell aquatic plants and animals, and shoreline restoration and construction projects.⁷ Notably, AIS may “hitchhike” on boats or gear used in boating activities, and many aquatic species do not need to be submerged in water at all times or at all life stages, meaning they can often survive during periods of transport from one water body to another.⁸

Given the extensive costs associated with AIS, it is unsurprising that efforts are being made by governmental, tribal, and private entities to combat the introduction of invasive species into the ecosystem, but these efforts have yet to be successful in fully eliminating the spread of invasive species.

b. E-Commerce

In 2023, there is little that can be done in person that cannot be done online. One of the many freedoms afforded by the internet is the ability to participate in electronic commerce, or e-commerce. E-commerce is “a term that covers everything a business does online to sell to consumers, both domestically and overseas. It includes: the sale through a website[,] the online advertising that leads to a sale[, and] the brand building that helps tie it all together as a narrative for consumers.”⁹ “Trade has long been recognized as a conduit for dispersing invasive species, and the problem has evolved and grown with the rise in global e-commerce, which has expanded

⁷California Aquatic Invasive Species Management Plan, <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=3868&inline=1> (last visited Jan 24, 2023).

⁸What Is an Aquatic Invasive Species?, U.S. FISH AND WILDLIFE SERVICE (2021), <https://www.fws.gov/story/what-aquatic-invasive-species> (last visited Jan. 20, 2023).

⁹ECommerce Resources, INTERNATIONAL TRADE ADMINISTRATION, <https://www.trade.gov/ecommerce> (last visited Jan. 20, 2023).

the field of potential trading partners, and allows individuals to easily participate in the market for living organisms.”¹⁰ E-commerce has only been increasing in recent years, and the ubiquity of the internet means that global pathways for commerce have emerged to create highly accessible pathways of selling and buying of diverse goods. This is true in the arena of plant and animal trade, which often results in invasive plant and animal trade. According to a report on e-commerce in the global aquarium industry, [a] variety of formal and informal marketplaces have been created to meet the demand for ornamental aquarium species. Major multinational (i.e., Petco, PetSmart) and local pet stores have followed this trend by shifting portions of their live organism sales online to create a formal web marketplace where transactions occur between a business and a consumer. Increasingly, hobbyists participating in the ornamental aquarium trade are also engaging in alternative informal online marketplaces that enables peer-to-peer selling of aquarium organisms.¹¹

This shift to online retail of aquarium species means that regulations designed to prevent the spread of invasive species, which have largely been drafted with brick-and-mortar businesses in mind, are unable to keep up with the trade that occurs via the Internet. Additionally, the monitoring for violations of invasive species laws has not kept pace with the rapid rise of e-commerce, which has allowed non-complying entities to escape liability by utilizing informal marketplaces to buy and sell invasive species. These informal marketplaces “foster an environment where sellers can purposefully, or unknowingly, evade regulations through falsifying documents and utilizing transshipments (i.e., shipment of goods or containers to an

¹⁰Internet Invasives: The Eco Threat of Online Shopping, FISHBIO (2022), <https://fishbio.com/internet-invasives-eco-threat-online-shopping/> (last visited Jan 10, 2023).

¹¹Julian D. Olden, Ethen Whattam & Spencer A. Wood, *Online Auction Marketplaces as a Global Pathway for Aquatic Invasive Species*, 848 HYDROBIOLOGIA 1967-79 (2020) (internal citations omitted).

intermediate destination, then to another destination) of nonnative or prohibited species.”¹²

Traditional efforts to prevent the spread of AIS that do not address the portion of AIS trade that occurs electronically will fail to be effective.

III. Legal Landscape of AIS in the United States

The legal landscape of invasive species law is complex and interconnected between the federal, state, tribal, and local levels. At the federal level, multiple agencies are tasked with enforcing various environmental laws which deal directly and indirectly with invasive species, particularly AIS. These federal actions work both independently and in connection with state laws, which tend to be more specific to that states’ needs and priorities. Many states have laws designed to prevent the introduction and spread of invasive species within their borders. Nearly all states have some law on record intended to prohibit the introduction of invasive species.¹³ However, despite existing federal and state laws, there are dynamics that allow for invasive species to remain a threat to local ecosystems. According to a report on federal invasive species laws and initiatives,

“[n]o laws focus on the broad problems of invasive species, their interception, prevention, and control across a variety of industries and habitats. Instead, the current legal framework is largely governed by a patchwork of laws, regulations, policies, and programs. Some laws are tailored to individual species or narrowly focused on what is affected by the species, such as agricultural production or certain aquatic or terrestrial ecosystems. Other laws have a broader intended purpose and may only peripherally address invasive species, such as certain environmental laws, resource management laws, and species or wildlife protection laws. Some laws, though they do

¹²Julian D. Olden, Ethen Whattam & Spencer A. Wood, *Online Auction Marketplaces as a Global Pathway for Aquatic Invasive Species*, 848 HYDROBIOLOGIA 1967-79 (2020).

¹³Local Government Aquatic Invasive Species Toolkit, WESTERNAIS, <https://www.westernais.org/local-government> (last visited Jan. 23, 2023).

not directly address invasive non-native species control or prevention, have effects that may limit such introductions.¹⁴

This means that although there are laws enacted in AIS arena, they are not working together effectively to target the key problems allowing invasive species to spread. Additionally, as previously mentioned, many of the existing laws do not adequately address the spread of invasive species through e-commerce.

a. Federal Legal Framework

The federal government has an extensive and long-standing body of law designed to prevent the spread of invasive species. Because of the magnitude of harm caused by invasive species, the federal government's involvement in combating the spread of invasive species is vast: a recent study found that at least 32 federal agencies share responsibilities regarding the prevention, eradication, and control efforts related to invasive species.¹⁵ The federal government typically focuses on preventing the introduction of invasive species into the country and providing funding to the states to support prevention, control, and management programs.¹⁶ While it is beyond the scope of this paper to detail every federal law or action designed to address the threat of invasive species, some are crucial to understanding the overall regulatory landscape addressing AIS.¹⁷

i. The Lacey Act

¹⁴Renee Johnson, R. Eliot Crafton & Harold F. Upton, *INVASIVE SPECIES: MAJOR LAWS AND THE ROLE OF SELECTED FEDERAL AGENCIES* (2017), <https://crsreports.congress.gov/product/pdf/R/R43258> (last visited Jan 20, 2023).

¹⁵Jhoset Burgos-Rodríguez & Stanley W. Burgiel, *Federal Legal Authorities for the Early Detection of and Rapid Response to Invasive Species*, 22 *BIOLOGICAL INVASIONS* 129–146 (2019).

¹⁶Local Government Aquatic Invasive Species Toolkit, WESTERNAIS, <https://www.westernais.org/local-government> (last visited Jan. 23, 2023).

¹⁷For a comprehensive look at federal efforts to combat the spread of invasive species, see CONGRESSIONAL RESEARCH SERVICE, *Invasive Species: Major Laws and the Role of Selected Federal Agencies* (Jan.17, 2017) <https://crsreports.congress.gov/product/pdf/R/R43258>.

The Lacey Act, first passed in 1900 and amended routinely since, is a wide-sweeping law designed to address the illegal import of wildlife—and, through amendments, plants—into the United States. Title 16 of the Act makes it unlawful for any person “to import, export, transport, sell, receive, acquire, or purchase any fish or wildlife or plant taken, possessed, transported, or sold” in violation of any federal, tribal, state, or foreign law. Title 16 trafficking violations require two actions. First, there must be an underlying or “predicate” violation of federal, tribal, state, or foreign wildlife-related law. If a predicate violation exists, the affected wildlife can be considered “tainted.” Second, a person must “import, export, transport, sell, receive, acquire, or purchase” the tainted wildlife or attempt to do one of those actions. As a result, Title 16 of the Lacey Act is only as strong as the underlying laws upon which the violation is based.

A single action cannot give rise to a Lacey Act violation. For example, the act of killing a game bird out of season cannot count as both “taking” the bird in violation of underlying law and “acquiring” it in violation of the Lacey Act. The government must prove that two separate violations occurred. Violating a state invasive species law alone will not constitute a violation of the Lacey Act, because when the underlying law is state law, the overlying offense (e.g., import, transport, sale, purchase) must occur in interstate commerce.

Title 18 of the Lacey Act regulates the import of injurious species into the United States, and is discussed in more detail below.

ii. National Invasive Species Council

Executive Order 13,112 established the National Invasive Species Council to “provide the high-level vision and leadership necessary to sustain and expand Federal efforts to safeguard interests of the United States by preventing, eradicating, and controlling invasive species, as well

as restoring ecosystems and other assets impacted by invasive species.”¹⁸ The Council has members from an array of federal agencies and works to further promote the invasive species efforts of the individual agencies. NISC is required to biennially produce the National Invasive Species Management Plan in order to aid federal agencies in developing and implementing measures responding to the invasive species problem.¹⁹

b. State Legal Frameworks

Pursuant to the Tenth Amendment of the U.S. Constitution, states retain the power to regulate when the constitution has neither granted the federal government authority to act nor prohibited the states from acting.²⁰ Because of this reserved authority, states are able to regulate broadly under their police power; this includes the right to regulate for the “public safety, public health, morality, peace and quiet, law and order” of its citizens.²¹

Almost all states in some way prohibit the import, transport, sale, and possession of invasive species without a permit from the responsible state agency. Many states have lists of prohibited species outlined in their statutes or regulations,²² while some states have unofficial lists of invasive or noxious species available.²³ Generally, implementation of state regulations related to invasive species is centralized in one or two state agencies. In Oregon, for example, the Oregon Department of Fish and Wildlife is responsible for implementing rules regarding non-native wildlife, including AIS, while the Oregon Department of Agriculture is the lead for non-

¹⁸Executive Order 13112 on Invasive Species (64 Fed. Reg. 6183, February 8, 1999).

¹⁹Jason A. Boothe, *Defending the Homeland: A Call to Action in the War Against Aquatic Invasive Species*, 21 Tul. Envtl. L.J. 407, 417 (2008).

²⁰U.S. CONST. amend. X.

²¹*Berman v. Parker*, 348 U.S. 26, 32, 75 S. Ct. 98, 102, 99 L. Ed. 27 (1954).

²²For one example of a statutory list of invasive species, see Wis. Adm. Code § NR 40.04. Available at https://docs.legis.wisconsin.gov/code/admin_code/nr/001/40/04.

²³Montana, for example, identifies invasive species in an unofficial list compiled by agency representatives from the state’s Departments of Agriculture; Transportation, Natural Resources and Conservation; and Fish, Wildlife & Parks. The species must also be recognized by the Montana Invasive Species Council (MISC). MONTANA NATURAL HERITAGE PROGRAM, “Species,” *Montana Field Guide – Special Status Codes* (last accessed Jan. 23, 2023). Available at <http://fieldguide.mt.gov/displaySpecies.aspx?inv=AIS>.

native plants.²⁴ In addition to listing prohibited species, many states are coordinating between their agencies to adopt management plans for aquatic invasive species and invasive plants and animals. Currently, forty-two states have management plans to control or prevent the spread of aquatic invasive species specifically.²⁵

The general prohibition for a listed species is largely the same: possession of the listed species within the state without a permit from an applicable agency is illegal. However, states vary in how they define possession, and how they shape their laws in order to regulate the purchase, sale, transport, and trade in listed invasive species. States may choose to regulate both the processes for legal introductions of invasive species into the state and how they wish to eliminate unintentional introductions. The four most common regulation tools include permits and licenses, transportation and shipping requirements, monitoring, and bonds and insurance.²⁶

Despite the widespread adoption of invasive species regulations among the states, existing gaps must be addressed in order to minimize the spread of invasive species. Gaps exist for multiple reasons. First, states laws are often species-specific, with states commonly taking a black list approach to invasive species,²⁷ which means any species not listed is not covered by invasive species law. Second, states frequently regulate invasive species inconsistently with neighboring states or tribes, leading to gaps in regulations which may allow the spread of invasive species even where regulations are robust. Third, invasive species frameworks are

²⁴Local Government Aquatic Invasive Species Toolkit, WESTERNAIS, <https://www.westernais.org/local-government> (last visited Jan. 23, 2023).

²⁵Aquatic Nuisance Species Task Force: U.S. Fish & Wildlife Service, FWS.GOV, <https://www.fws.gov/program/aquatic-nuisance-species-task-force/what-we-do> (last visited Feb 27, 2023).

²⁶Halting the Invasion State Tools for Invasive Species Management, ENVIRONMENTAL LAW INSTITUTE (2002), <https://www.eli.org/sites/default/files/eli-pubs/d12-06.pdf> (last visited Jan 5, 2023).

²⁷A black list approach means that only species listed are prohibited. The opposite approach is a white list, where only those species found not to be invasive are added to the list, and unlisted species are prohibited.

largely reactive rather than proactive. Finally, any state prohibition or regulation on invasive species must be tailored so as not to violate the federal Commerce Clause.

i. Species-specific

State laws on invasive species are often species-specific, because states create lists of prohibited species that they then ban from their states except under limited circumstances. At both the state and federal levels, there are administrative channels to add or remove species from these lists. Any listed species is prohibited in some capacity, and species not listed are unregulated. Thus, protections and prohibitions only apply to species identified through the listing process within the state or federal government, often an inefficient process.²⁸

In a study of the aquatic invasive species laws of the Great Lakes region,²⁹ the National Sea Grant Law Center (NSGLC) found few laws directly regulating the pathways of invasive species, with the exception of the aquaculture and live bait pathways. This indicates that invasive species are being regulated once they are listed as prohibited or restricted. While the NSGLC study identified “catch-all” AIS provisions which prohibited the sale of non-native species, which would apply to any sale regardless of the pathway in which the sale was taking place, these provisions only apply to listed invasive species.³⁰ Further, while these laws apply to brick-and-mortar sales of species the same as sales via e-commerce platforms, the global and largely unmonitored nature of e-commerce means that there are vast opportunities for unlisted species to be introduced well before they make it through the listing process and thus become subject to regulation.

²⁸James S. Neal McCubbins et al., *Frayed Seams in the "Patchwork Quilt" of American Federalism: An Empirical Analysis of Invasive Plant Species Regulation*, 43 ENVIRONMENTAL LAW 35–81 (2013).

²⁹The study reviewed the laws of Ontario, Quebec, Minnesota, Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania, and New York.

³⁰Stephanie Otts & Terra Bowling, BUILDING CONSENSUS TO IDENTIFY AND ADDRESS PRIORITY AQUATIC INVASIVE SPECIES AND VECTORS IN THE GREAT LAKES, <https://nsglc.olemiss.edu/Advisory/invasive-species/greatlakesais.pdf> (last visited Nov 30, 2022).

ii. Inconsistencies

State lists of invasive species are frequently inconsistent with their neighbors. A study of regulated plant taxa across the United States “assessed consistency among regulated taxa based on similarities in adjacent states’ regulatory lists” and found that only an average of 16.8% of regulated taxa overlapped between neighboring states.³¹ This “little geographic clustering of regulated species” suggests that there is little consistency between the states.³² Massachusetts and New Hampshire had the highest cross-border consistency, with a 51.9% overlap or 42 taxa in common across 81 taxa regulated in either state, with Massachusetts and Connecticut close behind at 50.5% overlap (49 taxa in common across 97 taxa regulated in either state). This suggests that despite the fact that species distribution rarely follows geopolitical boundaries, invasive species prevention efforts start and stop along such geopolitical boundaries in many cases. Without consistency between states, particularly states with shared ecosystems like bodies of water, even the most robust state invasive species laws will not be effective.

Additionally, there is inconsistency in what it means for a species to be “prohibited” in a certain state. The NSGLC’s study of invasive species laws in the Great Lakes region found that even where species are considered prohibited, different actions may or may not fall under that umbrella. For example, the bighead carp (*Hypophthalmichthys nobilis*) is prohibited in 10 of the 10 Great Lakes jurisdictions, all of whom expressly forbid the possession, sale, and release of the species. However, only 8 jurisdictions expressly prohibit the purchase or import of bighead carp; 7 forbid transport; 6 forbid propagation; 5 offer for sale, barter, gift, trade, or transfer; and only 3

³¹Evelyn M. Beaury et al., *Plant Regulatory Lists in the United States Are Reactive and Inconsistent*, 58 JOURNAL OF APPLIED ECOLOGY 1957–1966 (2021).

³²*Id.*

of the 10 states prohibit the lease or loan of bighead carp.³³ Thus, despite the uniform listing of bighead carp as a prohibited species, there is no uniform list of prohibited acts related to bighead carp. The inconsistency is even more dramatic when looking at prohibited versus restricted species, where certain activities may be permitted with the granting of a permit by a state agency.

These inconsistencies influence the effective implementation of regulations and result in confusion among those affected. Buyers and sellers may inadvertently sell or purchase a species that is prohibited in their state when information on species regulation is not readily available. Confusion and lack of information creates loopholes for sellers who—either inadvertently or knowingly—take advantage and sell invasive species to unwitting buyers. This is particularly true where individuals are participating in interstate commerce, such as by using e-commerce platforms.

Consider how variable state species regulation coupled with e-commerce sale can translate into the introduction of AIS. For example, a hobby aquarist in Georgia purchases water hyacinth (*Eichhornia crassipes*) for their aquarium. Water hyacinth, native to South America, is a popular aquarium plant, but can cause significant damage when introduced to novel ecosystems. It has spread to countries worldwide and can be found throughout fresh waters of the southeast United States, as well as in California and Washington state.³⁴ While the state of Georgia recognizes the water hyacinth as invasive and its state management plan ranks it as a Category 1—or most concerning—invasive species, there are minimal state laws regarding aquatic

³³Stephanie Otts & Terra Bowling, BUILDING CONSENSUS TO IDENTIFY AND ADDRESS PRIORITY AQUATIC INVASIVE SPECIES AND VECTORS IN THE GREAT LAKES, <https://nsglc.olemiss.edu/Advisory/invasive-species/greatlakesais.pdf> (last visited Nov 30, 2022).

³⁴*Eichhornia Crassipes*, CENTER FOR AQUATIC AND INVASIVE PLANTS, <https://plants.ifas.ufl.edu/plant-directory/eichhornia-crassipes/> (last visited Jan 26, 2023).

invasive plants, and the water hyacinth is not prohibited.³⁵ However, the water hyacinth is identified as invasive—and prohibited—in neighboring states of Florida, South Carolina, and Alabama.³⁶

A hobby aquarist could easily find water hyacinth available for sale online and purchase it. Amazon alone has several listings for water hyacinth; one seller mentions that shipping to AL, FL, and SC (as well as ID, TX, and WI) is prohibited but does not mention state invasive species laws or warn potential buyers that water hyacinth is invasive and may be prohibited.³⁷ Another listing comes from a brand called Florida Aquatic Nursery, indicating they are located within Florida, where water hyacinth is prohibited.³⁸ Thus, despite the prohibition of water hyacinth by Georgia’s neighbors, an aquarist in Georgia may purchase it online, having the plant shipped through states where illegal and into Georgia where it is legal to possess.

If a hobby aquarist decides to dispose of the water hyacinth, proper disposal is needed to ensure that it does not spread. If instead, the unwanted plant is dumped into a nearby water body, this could lead to spread into downstream systems. However, if that body of water is shared by Georgia and another state, such as Florida, the quick-growing water hyacinth will likely spread

³⁵Georgia Invasive Species Strategy, (2009), <https://georgiawildlife.com/sites/default/files/wrd/pdf/management/GeorgiaInvasiveSpeciesStrategy.pdf> (last visited Jan 25, 2023). See also 2023 List of Regulated or Illegal Aquatic Plants, POND PLANTS ONLINE, <https://www.pondplantsonline.com/pages/2016-list-of-regulated-or-illegal-aquatic-plants> (last visited Jan 31, 2023).

³⁶Florida regulations state that “[u]nder no circumstances will [water hyacinth] be permitted for possession, collection, transportation, cultivation, and importation” except with a valid permit. § 5B-64.011, Fla. Stat. (2008). South Carolina law states that “no person shall possess, sell, offer for sale, import, bring, or cause to be brought or imported into this State, or release or place into any waters of this State” S.C. Code Ann. § 50-13-1415 (2019). Finally, water hyacinth is listed on the State of Alabama Weed List (Ala. Code § 80-10-14-.04), and under the nonindigenous aquatic plant regulation. Ala. Code § 220-2-.124. These regulations prohibit the transport of designated noxious weeds into or within Alabama, along with prohibiting the introduction of noxious weeds into the public waters of Alabama.

³⁷AquaLeaf Aquatics, WATER HYACINTH - FLOATING LIVE POND PLANT BY AQUARIUM PLANTS DISCOUNTS, <https://a.co/d/5PnHWc2> (last visited Jan 31, 2023).

³⁸Florida Aquatic Nursery, WATER HYACINTHS FLOATING WATER GARDEN PLANTS, <https://a.co/d/fwwVnSk> (last visited Jan. 31, 2023).

into Florida waters despite Florida’s long-standing prohibition of water hyacinth and extensive statewide efforts to eradicate it. Because of inconsistent lists and regulations between neighboring states, invasive species can spread even where parties are not in violation of the law.

iii. Reactive Response

The state regulatory lists of invasive species tend to be reactive instead of proactive; this means that an invasive species may not be listed until it is already present in a state and has caused significant harm. “Preventing invasive plant introductions to new regions is the only sure way to stop invasions, but rather than focusing on prevention. . .most regulated plants in the United States were already present, if not widespread, in the states where they were regulated.”³⁹ In a study of state plant regulatory lists across the United States, only 11% of taxa were listed proactively; largely, taxa were not listed until they were present—and frequently widespread—in the state.⁴⁰ 48% of the proactive listings were proactive to climate change, meaning the taxa were listed because they could become invasive in the state as a result of climate change’s impacts on the states’ ecosystems.⁴¹ This reactivity is in part directly caused by the way different states regulate their invasive species. “For example, Massachusetts regulations require that a species has documented impacts in New England prior to regulation, which could preclude proactive listing. On the other hand, Wisconsin may delist a species that is already widespread to the point that eradication is unlikely.”⁴² While this type of regulatory approach is likely intended to aid in prioritizing which species to focus on, it inhibits preventative measures, which are by far the most effective way to deal with invasive species.

³⁹Evelyn M. Beaury et al., *Plant Regulatory Lists in the United States Are Reactive and Inconsistent*, 58 JOURNAL OF APPLIED ECOLOGY 1957–1966 (2021).

⁴⁰Evelyn M. Beaury et al., *Plant Regulatory Lists in the United States Are Reactive and Inconsistent*, 58 JOURNAL OF APPLIED ECOLOGY 1957–1966 (2021).

⁴¹*Id.*

⁴²*Id.*

c. Commerce Clause Considerations

While many states have laws on the books regarding invasive species, one jurisdictional concern that arises frequently is the implication of the federal Commerce Clause on states' authority to regulate or prohibit the import or transport of species within their borders. The Commerce Clause, which is Article 1, Section 8, Clause 3 of the U.S. Constitution, invests Congress with the power to regulate commerce "among the several States."⁴³ The negative implication of the Commerce Clause is that states do *not* have the power to regulate interstate commerce because Congress' power in that arena is exclusive.⁴⁴ States are generally barred from regulating interstate commerce even when Congress has not regulated. This negative aspect of the Commerce Clause is commonly referred to as the "dormant Commerce Clause," and it is the primary restriction on the power of states to enact laws and regulations that would normally be within their legislative powers but that impermissibly burden interstate commerce.

Under the U.S. Supreme Court's dormant Commerce Clause decisions, a state statute that facially discriminates against interstate commerce is unconstitutional unless the state can show that two conditions are met: (1) the statute serves a legitimate state purpose, and (2) the purpose is one that cannot be served as well by available nondiscriminatory means.⁴⁵ "In contrast, if the regulations apply evenhandedly to in-state and out-of-state interests, the party challenging the regulations must establish that the incidental burdens on interstate and foreign commerce are clearly excessive in relation to the putative local benefits."⁴⁶

⁴³U.S. CONST. art. I, § 8, cl. 3.

⁴⁴The underlying rationale is that the Constitution's framers sought to avoid the economic balkanization and commercial warfare – figurative and literal – among the states that would almost inevitably result if states were allowed to freely regulate trade to their own advantage. *See generally H.P. Hood & Sons v. Du Mond*, 336 U.S. 525 (1949) (discussing history and philosophy of the commerce clause).

⁴⁵*Maine v. Taylor*, 477 U.S. 131, 140 (1986).

⁴⁶*Pac. Nw. Venison Producers v. Smitch*, 20 F.3d 1008, 1012 (9th Cir. 1994).

While the Commerce Clause significantly limits the ability of states and localities to regulate or otherwise burden the flow of interstate commerce, it does not elevate free trade above all other values. As long as a state does not needlessly obstruct interstate trade or attempt to "place itself in a position of economic isolation,"⁴⁷ it retains broad regulatory authority to protect the health and safety of its citizens and the integrity of its natural resources. This freedom allows states to promulgate regulations designed to protect their natural resources despite potential burdens on interstate commerce.

When a state passes a statute that requires all entities involved, both those in-state and out-of-state, to follow the same requirements to prevent the introduction of invasive species, the court will uphold the statute "unless the burden imposed on such commerce is clearly excessive in relation to the putative local benefits."⁴⁸ However, even this balancing test has been considered unnecessary by some courts in adjudicating dormant Commerce Clause challenges to state AIS statutes. In upholding a Michigan ballast water statute requiring all boats releasing ballast water in the state to have permits, the Court of Appeals for the Sixth Circuit found that the dormant Commerce Clause analysis was unnecessary because Congress has expressly intended the states to regulate aquatic invasive species within their borders.⁴⁹ "Congress expressly contemplated, and indeed encouraged, state participation in ANS prevention measures. We would lose our constitutional bearings if we were to hold that the Commerce Clause, in its dormancy, strikes down state regulation that Congress, in actively exercising its power under the Clause, expressly contemplated."⁵⁰

⁴⁷Baldwin v. G. A. F. Seelig, Inc., 294 U. S. 511, 294 U. S. 527 (1935).

⁴⁸Pike v. Bruce Church, Inc., 397 U.S. 137, 142, 90 S.Ct. 844, 25 L.Ed.2d 174 (1970).

⁴⁹Fednav, Ltd. v. Chester, 547 F.3d 607, 624 (6th Cir. 2008).

⁵⁰Fednav, Ltd. v. Chester, 547 F.3d 607, 624 (6th Cir. 2008).

The seminal case involving facially discriminatory AIS measures is *Maine v. Taylor*, in which a bait business owner in Maine arranged to import 158,000 golden shiner minnows from other states to sell in his business in violation of a Maine statute prohibiting the importation of live baitfish from other states.⁵¹ The shipment was intercepted, and the business owner was indicted for conspiring to import fish in violation of state law, a Lacey Act violation. The defendant moved to dismiss the indictment, arguing that the Maine statute was an unconstitutional burden on interstate commerce and thus could not form the basis for a Lacey Act violation.

The State of Maine defended the validity of its statute on the grounds that the ban legitimately protected the state's minnow population from the introduction of new harmful parasites and nonnative species. The Supreme Court found that the state statute was facially discriminatory but upheld the law because it determined that Maine proved both that the statute served a legitimate state purpose, and the purpose was one that cannot be served as well by available nondiscriminatory means.⁵² In so holding, the Supreme Court said:

[The state] has a legitimate interest in guarding against imperfectly understood environmental risks, despite the possibility that they may ultimately prove to be negligible. The constitutional principles underlying the commerce clause cannot be read as requiring the State ... to sit idly by and wait until potentially irreversible environmental damage has occurred ... before it acts to avoid such consequences.⁵³

Thus, because Maine was able to prove their legitimate interest in protecting their natural resources and because they showed that no currently available nondiscriminatory means of

⁵¹Maine v. Taylor, 477 U.S. 131 (1986).

⁵²Maine v. Taylor, 477 U.S. 131 (1986).

⁵³Maine v. Taylor, 477 U.S. at 148 (internal quotation omitted).

effecting the same result existed, their statute was constitutional despite being facially discriminatory. Other cases, before and after Taylor, have found that such statutes are valid ways of protecting the state’s resources.⁵⁴ Thus, while the Commerce Clause—and in particular the dormant Commerce Clause—has broad impacts on a state’s power to regulate interstate commerce, states have authority to pass prohibitions on the import of invasive species provided that the statute meets the test laid out by the Supreme Court.

d. Import vs. Interstate Transport

It should be noted that there is a distinction between the import of invasive species into the United States and the transport or trade of those species among the 50 states. This paper will focus on the latter. Import of invasive species in the United States is regulated primarily under Title 18 of the Lacey Act⁵⁵, and is enforced by a suite of federal agencies, including the United States Fish and Wildlife Service (FWS), NOAA’s National Marine Fisheries Service (NMFS), and the United States Department of Agriculture’s (USDA) Animal and Plant Health Inspection Service (APHIS).⁵⁶ Title 18 of the Lacey Act, which is often referred to as the “injurious species provision,” authorizes the Department of Interior, through FWS, to prohibit the importation of species “deemed to be injurious or potentially injurious to the health and welfare of human beings, to the interest of forestry, agriculture, and horticulture, and to the welfare and survival of the wildlife or wildlife resources of the United States.” Congress may also designate species as injurious through legislation.

⁵⁴See *Pac. Nw. Venison Producers v. Smitch*, 20 F.3d 1008, 1014 and 1017 (9th Cir. 1994), “Regulations promulgated pursuant to the state’s interest in the preservation of its wildlife carry a strong presumption of validity. . . Particularly when the extent of the risks is in dispute, the Department is clearly permitted to err on the side of excess in taking precautionary measures[.]”

⁵⁵The Lacey Act, 18 U.S.C. § 42 (2018).

⁵⁶“APHIS, the National Marine Fisheries Service, and the U.S. Fish and Wildlife Service administer the Lacey Act.” Lacey Act, ANIMAL AND PLANT HEALTH INSPECTION SERVICE, U.S. DEPARTMENT OF AGRICULTURE (2023), <https://www.aphis.usda.gov/aphis/ourfocus/planthealth/import-information/lacey-act/lacey-act> (last visited Jan. 31, 2023).

However, Title 18 of the Lacey Act only applies to injurious species *imported* into the U.S., and thus does not apply to the interstate commerce of listed species. Prior to 2017, FWS asserted jurisdiction to regulate the interstate transportation of listed species as well as their import, relying on the shipment clause of Title 18, which prohibits “any shipment between the continental United States, the District of Columbia, Hawaii, the Commonwealth of Puerto Rico, or any possession of the United States” of injurious species.⁵⁷ However, the U.S. Circuit Court of Appeals for the District of Columbia rejected this interpretation of the Lacey Act in 2017, holding that “the government lacks authority under the shipment clause (of the Lacey Act) to prohibit shipments of injurious species between the continental States.”⁵⁸ As a result of this ruling, state governments and their subdivisions—such as state agencies or municipalities—are the only entities who are legally able to deal with the issue of interstate invasive species movement.

While jurisdictional questions arise regarding enforcement at the federal levels, for example how FWS enforces the Lacey Act with respect to wildlife (animals)⁵⁹ and APHIS enforces the Lacey Act with respect to plants,⁶⁰ the main question surrounding the import and export of prohibited species is simply the adequacy of these agencies’ enforcement efforts. With

⁵⁷18 U.S.C. § 42(a)(1).

⁵⁸United States Ass'n of Reptile Keepers, Inc. v. Zinke, 852 F.3d 1131 (D.C. Cir. 2017).

⁵⁹“The U.S. Fish and Wildlife Service Office of Law Enforcement regulates all international movement of wildlife in, out and through the United States. . . [FWS] defines Fish and Wildlife as any wild animal, **whether alive or dead**, including without limitation any wild mammal, bird, reptile, amphibian, fish, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, **whether or not bred, hatched, or born in captivity, and including any part, product, egg, or offspring thereof.**” Information for Importers & Exporters, OFFICE OF LAW ENFORCEMENT, U.S. FISH & WILDLIFE SERVICE (2021), <https://www.fws.gov/program/office-of-law-enforcement/information-importers-exporters> (last visited Jan 31, 2023).

⁶⁰“APHIS is responsible for collecting declarations for imported plants and plant products, and defining the scope of plant materials that require a declaration.” Lacey Act, ANIMAL AND PLANT HEALTH INSPECTION SERVICE, U.S. DEPARTMENT OF AGRICULTURE (2023), <https://www.aphis.usda.gov/aphis/ourfocus/planthealth/import-information/lacey-act/lacey-act> (last visited Jan. 31, 2023).

respect to the transport of AIS across state lines, there is little role for Title 18 of the Lacey Act to play.⁶¹

IV. Key Players in e-Commerce Sales and Legal Responsibilities

In an e-commerce transaction there are three main parties: the seller, who is usually the party who ships the purchased good; the shipping agent or company (hereafter referred to as the transporter); and the buyer, who is the recipient of the seller's shipment. Sellers can range from large, established companies such as PetSmart to individuals using online platforms.

Transporters include the United States Postal Service (USPS), FedEx, United Parcel Service (UPS), and other non-governmental courier services. Each of these parties in an e-commerce transaction has distinct legal responsibilities to prevent the introduction of aquatic invasive species into the ecosystem.

a. Seller/Shipper

Parties who are selling animals and plants are responsible for ensuring that they are not doing so in violation of state or federal law. In its most basic form, this burden is straightforward. For example, Michigan prohibits the sale of bighead carp (*Hypophthalmichthys nobilis*).⁶² An individual or business in Michigan who sells a bighead carp is thus in violation of Michigan state law for doing so. Complexities arise, however, when this transaction occurs across state lines. If a seller offers a species that is permitted in their state for sale to a buyer in another state where such species are prohibited, it can be difficult to determine legal violations. The sale itself will be legal because if it occurred in a state where the species is not prohibited; however there are implications for both the seller and buyer once the species enters interstate commerce.

⁶¹For more information on the Lacey Act, see Information for Importers & Exporters, OFFICE OF LAW ENFORCEMENT, U.S. FISH & WILDLIFE SERVICE, (2021), <https://www.fws.gov/program/office-of-law-enforcement/information-importers-exporters> (last visited Jan 31, 2023).

⁶²Prohibited and Restricted Species, Michigan Invasive Species, <https://www.michigan.gov/invasives/id-report/prohibitedrestricted> (last visited Jan 31, 2023).

Where a species is “prohibited,” this nearly uniformly means the possession, sale, and release of the species is illegal in the state.⁶³ For example, in Minnesota, “[a] person may not possess, import, purchase, sell, propagate, transport, or introduce a prohibited invasive species” except under certain permitting exceptions.⁶⁴ Similarly, in New York, prohibited means that it is illegal to “sell, import, purchase, transport, introduce or propagate” the species.⁶⁵ Both of these definitions make clear that if a species is prohibited in their state, it is illegal to sell that species within the state. Additionally, some states prohibit the “offer to sell” of prohibited species; in Michigan, “[i]f a species is prohibited or restricted, it is unlawful to possess, introduce, import, sell or *offer that species for sale* as a live organism, except under certain circumstances.”⁶⁶

Neither state, however, mentions whether it is illegal to sell a species *into* a state where such species is prohibited from a place where such sale is legal. Many states prohibit importing a listed species, however that speaks only to the liability of the importing *buyer*; there is little clarity for the burden of a seller *exporting* a legal species. This gap is common among AIS laws in the states, and without clarification in the laws, there is potential for sellers to escape liability for their role in introducing invasive species into commerce.

Additionally, the seller of an invasive species in an e-commerce sale is also the shipper/mailed of that species and subsequently has legal burdens as the shipper of a regulated species. A USPS guidance document requires all mailers follow federal laws in shipping items,

⁶³Stephanie Otts & Terra Bowling, BUILDING CONSENSUS TO IDENTIFY AND ADDRESS PRIORITY AQUATIC INVASIVE SPECIES AND VECTORS IN THE GREAT LAKES, <https://nsglc.olemiss.edu/Advisory/invasive-species/greatlakesais.pdf> (last visited Nov 30, 2022).

⁶⁴MINN. STAT. ANN. § 84D.05 (2022).

⁶⁵NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE PROHIBITED AND REGULATED INVASIVE PLANTS 1 (2014) https://www.dec.ny.gov/docs/lands_forests_pdf/isprohibitedplants2.pdf

⁶⁶Prohibited and Restricted Species, MICHIGAN INVASIVE SPECIES, <https://www.michigan.gov/invasives/id-report/prohibitedrestricted> (last visited Jan 31, 2023). (emphasis added) (note that Michigan classifies species as prohibited if they are invasive but not yet present or widespread in the state. Invasive species are classified as restricted if they are already established in the state.).

and the document references several federal statutes including the Lacey Act and the Endangered Species Act.⁶⁷ Additionally, the document expressly classifies as “nonmailable” any plant or animal whose shipment would violate the Lacey Act and provide for criminal penalties for those who knowingly violate the Lacey Act by shipping or causing to be shipped a prohibited species.⁶⁸ Thus, shippers of plants and animals are under a duty not to knowingly ship invasive or injurious species.

i. Illegal use of mail

One of the most prevalent barriers to preventing the spread of invasive species is the illegal use of mail services. This can occur both knowingly and accidentally but presents an opportunity for regulated species to be moved in violation of AIS laws. Shippers are afforded great privacy in their shipments, through U.S. Fourth Amendment search and seizure protections for packages sent via USPS, as well as government regulations and a sheer lack of resources to monitor and inspect all shipments. Sellers are frequently not required to fill out declarations or other acknowledgements affirming that their shipment is legal, and even where they are required to do so, they can fraudulently claim the contents of their shipment are legal with little fear of repercussion.⁶⁹

Because it may be unclear who is responsible for a shipment of invasive species where their legality is inconsistent between states, a seller may either ship a plant or animal legally that is then illegal for the recipient to possess or import, or the buyer may legally purchase a species

⁶⁷Publication 52 - Hazardous, Restricted, and Perishable Mail, POSTAL EXPLORER (2022), <https://pe.usps.com/text/pub52/welcome.htm> (last visited Jan 31, 2023).

⁶⁸Publication 52 - Hazardous, Restricted, and Perishable Mail, POSTAL EXPLORER (2022), <https://pe.usps.com/text/pub52/welcome.htm> (last visited Jan 31, 2023).

⁶⁹Sellers using informal e-commerce marketplaces evade regulations through falsifying documents and utilizing transshipments (i.e., shipment of goods or containers to an intermediate destination, then to another destination) of nonnative or prohibited species.” Julian D. Olden, Ethen Whattam & Spencer A. Wood, *Online Auction Marketplaces as a Global Pathway for Aquatic Invasive Species*, 848 HYDROBIOLOGIA 1967-79 (2020).

that has been illegally possessed by the seller and transported from its state of origin. A seller in that case may be able to avoid detection even where they are clearly in violation of state and federal law by shipping a prohibited species to an unsuspecting consumer in a state where possession of that species is not prohibited. Inconsistencies and confusion regarding the law then couples with the barriers in detecting illegal transport and enforcing existing laws, thus allowing the U.S.P.S. and private couriers to unwittingly assist in the movement of invasive species.

ii. Third-Party Platforms

If a seller uses a third-party platform to sell an invasive species, a question that arises is whether the platform is responsible for facilitating an illegal sale. Not only are formal marketplaces, such as physical stores (i.e., PetSmart and PetCo), gaining an online retail presence, but informal marketplaces have arisen globally as well. These informal marketplaces are typically “large online auction sites, and niche web businesses that attract hobbyists wanting to purchase specific species”, such as eBay or even social media sites.⁷⁰ Under U.S. law, sites that provide forums for sales are not legally responsible for violations of law by the buyers and sellers using those forums. Internet forums, such as Craigslist, are immune from liability for legal infractions committed by their users related to transactions facilitated by such sites under section 230 of the Communications Decency Act (CDA).⁷¹ In a study examining e-commerce and the plant genus *Caulerpa*, a highly invasive genus of macroalga, researchers won 60 eBay auctions to purchase *Caulerpa*, and eBay stated that it was the responsibility of the *seller* to know the applicable law.⁷² These forums may take voluntary action—such as including warnings

⁷⁰Julian D. Olden, Ethen Whattam & Spencer A. Wood, *Online Auction Marketplaces as a Global Pathway for Aquatic Invasive Species*, 848 HYDROBIOLOGIA 1967-79 (2020).

⁷¹*Dart v. Craigslist*, 665 F. Supp. 2d 961 (N.D. Ill. Oct. 20, 2009).

⁷²Linda J. Walters et al., *E-Commerce and Caulerpa: Unregulated Dispersal of Invasive Species*, 4 FRONTIERS IN ECOLOGY AND THE ENVIRONMENT 75-79 (2006).

on commercial posts or even removing posts entirely—to combat illicit behavior, including AIS trafficking.⁷³ However, it appears that most third-party e-commerce platforms leave educating buyers about jurisdiction-specific invasive species laws to the sellers using their sites.

b. Transporters

The legal responsibility of transporters, such as the U.S. Postal Service or a private courier such as UPS or FedEx, in detecting and preventing the shipment of invasive species is unclear. As mentioned previously, under state AIS laws generally, it is illegal to transport (and possess) a prohibited species. This means a transporter carrying an invasive species through a state in which that species is listed would be in violation of the prohibition. Thus, when reading the language of invasive species laws strictly, it appears that a transporter will be liable for any shipments in their possession that violate state or federal invasive species laws. The states vary in whether their invasive species laws contain a *mens rea* requirement (i.e., intent or knowledge of wrongdoing), and thus merely transporting (and, by necessity, possessing) an invasive species may not be sufficient to hold a transporter responsible for violating a state’s invasive species law. However, in those states where violations need not be knowing, a transporter could be liable for transporting prohibited species even where they do not, and in many cases cannot, know what they’re transporting.

According to a USPS guidance documents on mailable vs. non-mailable items, “[a]ll mailers, including mail service providers and other mailer agents, must comply with applicable

⁷³This issue often arises in the fashion industry when sellers of counterfeit items use third-party platforms like Amazon or eBay to sell knockoff goods. U.S. case law has been unwilling to hold those third-party sites liable for the sales of counterfeit goods on their sites, instead leaving it to the brands being copied to pursue recourse from the counterfeiters themselves. See *Gucci Am., Inc. v. Alibaba Grp. Holding Ltd.*, No. 15-CV-3784 (PKC), 2016 WL 6110565 (S.D.N.Y. Aug. 4, 2016) (where court dismissed claim of conspiracy by Alibaba, a third-party seller site, to produce and sell counterfeit goods with one of the retailers on its site). While a bill was introduced in the U.S. House of Representatives aiming to shift the burden of prohibiting sellers of counterfeit goods in e-commerce onto those third party platforms, the bill was not passed. SHOP SAFE Act of 2020, H.R. 6058, 116th Cong. (2020).

Postal Service laws and regulations governing mailability and preparation for mailing, as well as nonpostal laws and regulations on the shipment of particular matter.”⁷⁴ This section puts the duty on both the mailer (e.g., seller/shipper) and the transporter to follow the applicable shipment laws in shipping, accepting, and transporting packages. However, USPS employees “may not open mail sealed against inspection except under [listed exceptions]. Accordingly, knowledge of the content of such mail may be obtained directly from the mailer (e.g., a mailer may ask questions about mailing requirements. . .) or indirectly through leakage or other escape of the contents.”⁷⁵ Thus, if a package is shipped via USPS that package is likely to be accepted without examination beyond the packaging itself.

There is uncertainty whether this is the proper allocation of responsibility; if a transporter is unable to detect a nonmailable species—and, in the case of the USPS is not allowed to open packages that appear from the outside to be properly packaged and labeled—should that party ultimately be responsible for the conduct of a seller or a buyer?⁷⁶ Additionally, while any discoveries of nonmailable species in transit are to be reported, if there are no safeguards protecting the transporter from being charged with violating AIS laws, what incentive is there to detect or report such violations? These uncertainties point to another gap in the regulatory framework when dealing with AIS.

c. Purchaser/Buyer

⁷⁴Publication 52 - Hazardous, Restricted, and Perishable Mail, POSTAL EXPLORER (2022), <https://pe.usps.com/text/pub52/welcome.htm> (last visited Jan 31, 2023).

⁷⁵*Id.*

⁷⁶Because USPS is a federal government agency, there are governmental restrictions prohibiting it from seizing and opening packages sent through its channels. Because postal workers are federal employees, they must have a warrant in order to seize and search packages when looking for illegal items such as drugs. Private carriers, such as DHL or UPS, are not subject to constitutional search and seizure protections and may search packages they deem suspicious. Thus, if an illegal plant or animal is shipped through USPS, not only may USPS be unaware of the illegality of the shipment, but it may also be illegal for postal workers to discover the illegal nature of the shipment without probable cause. *See Seized Shipping Packages (FedEx, UPS, USPS), ASSET FORFEITURE ATTORNEY*, <https://www.assetforfeituredefender.com/practice-area/seized-shipping-packages> (last visited Jan 23, 2023).

The final chapter in the e-commerce of aquatic invasive species transaction is the purchaser/buyer of the invasive species. Generally, federal and state laws prohibit the possession of a species listed as invasive or injurious. Some states also explicitly prohibit the purchase of listed species. Therefore, an individual who purchases and takes possession of species listed as prohibited in their state has violated state law.

While this may sound clear-cut, it is not hard to find holes in these legal requirements. First, states differ on whether *import* of a prohibited species is illegal. Thus, the buyer may not be in violation of invasive species laws until they are in actual possession of the species within the state where it is prohibited, by which point the invasive species is already in the state. Further, mere possession of a listed species may not be enough for the purchaser to be charged with a crime. Many states require a knowing possession or violation of the law in order to be criminally liable.⁷⁷ Thus, a buyer who unknowingly purchases and takes possession of a prohibited species may not have committed a violation for which they can be criminally prosecuted.

This is not to say that nothing can be done. Under Title 16 of the Lacey Act, a buyer whose import or possession of a prohibited species constitutes a Lacey Act violation, as described above, can incur civil penalties of up to \$10,000 if they should have known that the fish, wildlife, or plants were taken, possessed, transported, or sold in violation of any underlying law.⁷⁸ Additionally, under federal law, seizure of prohibited invasive species is based on a theory

⁷⁷For one example, see Mich. Comp. Laws § 324.41303, which states that a person cannot knowingly possess a live organism that is a restricted species unless he or she possesses it in conjunction with a lawful activity to identify, eradicate, or control the species.

⁷⁸16 U.S.C. § 3373.

of strict liability, meaning the government may seize the species despite the buyer having unknowingly purchased or possessed the species.⁷⁹

Questions also arise regarding the fairness of holding a buyer of invasive species responsible for the conduct of a seller. While there are individuals who purposely import or purchase species they know are prohibited, this is not always the case. An individual may not know the plant or animal they've bought is prohibited, or they may not have meant to purchase a species at all, such as individuals purchasing contaminated products (e.g., invasive dreissenid mussel contaminated moss balls).

d. Barrier to Enforcement - Unclear Burdens

One of the main barriers to enforcement within the existing invasive species framework is the inconsistent and unclear legal liabilities among the various parties in an e-commerce context. As discussed above, the primary parties involved in e-commerce of aquatic invasive species are the seller/shipper, the transporter, and the buyer/recipient. While state and federal laws are explicit in banning the *possession* of prohibited species, questions arise regarding how that will play out in different scenarios. Each party is required to comply with the laws in their state, but when interstate commerce is involved, as is frequently the case with e-commerce transactions, the laws of the states of the seller and buyer may not provide complete coverage of the pathway of the sale.

For instance, in states where invasive species laws do not prohibit a party from offering for sale or exporting a species that is prohibited in the buyer's state, a seller may be able to sell species to buyers in states where that species is prohibited without any legal liability. In the shipper's jurisdiction possession and sale of the species was legal. Additionally, the transporter

⁷⁹Kristina Alexander, *The Lacey Act: Protecting the Environment by Restricting Trade*, CONGRESSIONAL RESEARCH SERVICE (2014), <https://sgp.fas.org/crs/misc/R42067.pdf> (last visited Jan 15, 2023).

may be technically liable for possessing and transporting a prohibited species despite not being aware of the contents of the shipment but prosecutions for such an unwitting violation would be unlikely. Finally, a buyer may escape liability for purchased AIS that travels through states where that species is prohibited. Because of the patchwork nature of aquatic and terrestrial invasive species regulation, nearly unlimited scenarios could occur where the law is inconsistent or does not cover the liability of the parties involved in the e-commerce of invasive species.

The current legal landscape provides for legal responsibility on the seller/shipper, the transporter, and the buyer. Sellers must comply with the invasive species laws in their state, as well as applicable shipping laws. Transporters must not transport or possess species that are prohibited in the states in which they operate. Buyers may not possess, and frequently may not purchase or import species in violation of the invasive species laws of their state.

However, fragmented laws segregate parties involved in a single transaction, rather than regulating the pathways by which invasive species may be introduced. Many efforts focus on buyer education and awareness, and focus less upon the seller and transporter. Sellers, who possess and market their products, are in the best position to know what they are offering for sale and whether such sale is legal. Buyers can only rely on available information, and may unwittingly purchase invasive species in search of another product. Thus, proper identification and labeling by the seller is critical to ensure buyers comply with applicable invasive species law. Additionally, sellers can take action to eliminate sales to buyers in states where species are prohibited with minimal effort. Sellers can indicate which species are prohibited, and could direct buyers to invasive species lists of different states, or they can maintain their own list for buyers to review.⁸⁰ While buyer education and compliance is a necessary aspect of reducing the

⁸⁰2023 List of Regulated or Illegal Aquatic Plants, POND PLANTS ONLINE, <https://www.pondplantsonline.com/pages/2016-list-of-regulated-or-illegal-aquatic-plants> (last visited Jan 31, 2023).

introduction of invasive species, efforts targeting sellers are likely to be more effective at reducing the introduction and spread of invasive species across state lines.⁸¹

V. Monitoring and Enforcement

Potentially the largest barrier to reducing the spread of invasive species is the difficulty in monitoring seller and buyer compliance with AIS laws and regulations and enforcing those laws. Without adequate monitoring and enforcement of violations, even the most comprehensive legal framework will be unable to address the harms of invasive species.

i. Monitoring

Monitoring e-commerce sales is challenging because the internet is a global online arena, with channels worldwide that can introduce invasive species. During a 7-year study of the aquarium trading website AquaBid, the site facilitated the trade of “539,548 live freshwater animals, 579,700 fish eggs, and 31,431 plant assortments/bunches among 24,409 unique users who collectively placed 444,132 bids on 192,227 auctions, representing a total sale value of \$6,015,030 USD. . .distributed across 39 countries”, although predominantly centered in the United States.⁸² This study focused solely on the ornamental aquarium trade, and found “a number of highly invasive species were being traded, including the common water hyacinth (*Eichhornia crassipes*) which appears on the IUCN list of the world’s top 100 most invasive species.”⁸³ The study noted that trade within the U.S. accounted for 78% of the auctions

⁸¹This approach—requiring sellers to ensure products are sold only to legal purchasers—is not unfamiliar in U.S. law. Consider, for example, sales of alcohol; only licensees may sell alcohol, and they are responsible for ensuring purchasers are of legal age at the time of sale. This is true even where third party platforms are transporting and delivering the alcohol to the buyer; the licensee, not the third-party, is responsible for ensuring all applicable laws are followed. See Rebecca Stamey-White, *Alcohol Marketplaces 2.0 Part 4: Who's Responsible for Ensuring Legal Drinking Age?*, HINMAN & CARMICHAEL LLP (2021), <https://www.beveragelaw.com/booze-rules/alcohol-marketplaces-20-part-4-whos-responsible-for-ensuring-legal-drinking-age> (last visited Jan 26, 2023).

⁸²Julian D. Olden, Ethen Whattam & Spencer A. Wood, *Online Auction Marketplaces as a Global Pathway for Aquatic Invasive Species*, 848 HYDROBIOLOGIA 1967-79 (2020).

⁸³*Id.*

examined, and international trade largely flowed from Europe or Asia into the U.S. These findings indicate the magnitude of the aquatic plant and animal e-commerce industry.

Web crawlers, like the one used in the Aquabid study, are emerging as potential tools to improve monitoring and detection of illegal transactions involving invasive species. A web crawler is “a computer program that browses the World Wide Web in a methodical, automated manner or in an orderly fashion. Web crawling is an important method for collecting data on, and keeping up with, the rapidly expanding Internet.”⁸⁴ Creators of these programs can use them to compile vast amounts of data to be used in research, regulation, and law enforcement capacities.

One successful web crawler is the Great Lakes Detector of Invasive Aquatics in Trade (GLDIATR), designed to run automated searches for websites and platforms selling prohibited species in the Great Lakes region.⁸⁵ This crawler is specifically focused on AIS, with a stated goal of helping:

resource managers identify, evaluate, prevent and minimize the risk that species will be imported into the Great Lakes region through online sales. By automatically identifying sales pages, GLDIATR simplifies the process for removing these invasive species from trade. This software enables managers to quickly identify sellers with regulated species offered for sale and notify those sellers to remove those regulated species from their inventory.⁸⁶

⁸⁴S. S. Dhenakaran & K. Thirugnana Sambanthan, *Web Crawler - An Overview*, 2 INTERNATIONAL JOURNAL OF COMPUTER SCIENCE AND COMMUNICATION 265–267 (2011).

⁸⁵GLDIATR: Leading the Fight Against Web Trafficking of Aquatic Invasive Species, PROJECT SUMMARY, <https://www.glc.org/wp-content/uploads/2013/10/GLC-ProjectSummary-GLDIATR-20160914.pdf> (last visited Jan 24, 2023).

⁸⁶GLDIATR: Leading the Fight Against Web Trafficking of Aquatic Invasive Species, PROJECT SUMMARY, <https://www.glc.org/wp-content/uploads/2013/10/GLC-ProjectSummary-GLDIATR-20160914.pdf> (last visited Jan 24, 2023).

In its initial 30 days, GLDIATR scanned over 300,000 web pages and identified 200 websites that had invasive species offered for sale, 56 of which were restricted.⁸⁷

Automated systems like GLDIATR have immense potential, however in order for web crawlers to be effective, they must know what to search for. A study of online commerce of *Caulerpa* macroalgae found that sellers correctly identified the caulerpa species they were selling 10.6% of the time.⁸⁸ Often, aquatic plants and animals simply cannot be classified accurately by genus and species, because those classifications may not yet exist or because common trade names are used which do not refer to a specific genus or species. If sellers are not reliably marking their products, web crawlers cannot track down invasive species on e-commerce sites reliably, thus inhibiting the efficacy of such solutions. Additionally, programs such as these are costly and time-consuming to produce, and their use in enforcement is heavily dependent on adequate budget and resources of local law enforcement officials tasked with monitoring and enforcement.⁸⁹

ii. Enforcement

With the rise and expansion of e-commerce, enforcing existing invasive species regulation has become more challenging. Not only are formal marketplaces, such as physical stores such as PetSmart and PetCo, gaining an online retail presence, but informal marketplaces have arisen globally as well. Not only do these third party e-commerce sites avoid legal liability for the illegal sales that occur between users of their platform, as discussed above, they facilitate transactions between global buyers and sellers who are able to maintain anonymity and thus

⁸⁷GLDIATR: Leading the Fight Against Web Trafficking of Aquatic Invasive Species, PROJECT SUMMARY, <https://www.glc.org/wp-content/uploads/2013/10/GLC-ProjectSummary-GLDIATR-20160914.pdf> (last visited Jan 24, 2023).

⁸⁸Linda J. Walters et al., *E-Commerce and Caulerpa: Unregulated Dispersal of Invasive Species*, 4 FRONTIERS IN ECOLOGY AND THE ENVIRONMENT 75-79 (2006).

⁸⁹INVASIVE SPECIES ADVISORY COMMITTEE, U.S. DEP'T OF THE INTERIOR, INVASIVE SPECIES AND E-COMMERCE (2012).

evade detection. Without significant resource expenditure, tracking down these sellers is nearly impossible.

Additionally, even where law enforcement officers are able to accurately detect a violation of a state or federal invasive species law, a lack of resources and competing prioritizations make it difficult to penalize more minor violations. Even with fines in place for offenders who are prosecuted, the authorized penalties are often quite low so there is little incentive for wildlife traffickers or profitable plant and animal sellers to comply with invasive species laws.

Until enforcement can be expedited with more efficient monitoring systems, voluntary “self-enforcement” may be an important aspect of slowing the spread of invasive species. If sellers and buyers go out of their way to comply with invasive species laws, lack of enforcement resources becomes less of a barrier. And although bad actors will never be eliminated, some sellers may be willing to better incorporate invasive species laws into their platforms even without mandatory enforcement. In GLDIATR’s initial 30-day test, the crawler automatically reached out to the seller’s whose sites listed invasive species, and by informing them of invasive species restrictions and best management practices, GLDIATR saw changes to shipping or stock in 27 cases.⁹⁰ Simply by informing the sellers that they may be in violation of invasive species laws and that evidence of these violations existed, many sellers altered their practices to align with the law. Thus, if monitoring programs such as GLDIATR also include some aspect of enforcement, there may be a large impact on e-commerce of invasive species.

VI. Conclusion

⁹⁰GLDIATR: Leading the Fight Against Web Trafficking of Aquatic Invasive Species, PROJECT SUMMARY, <https://www.glc.org/wp-content/uploads/2013/10/GLC-ProjectSummary-GLDIATR-20160914.pdf> (last visited Jan 24, 2023).

Because AIS in e-commerce is such a large and complicated issue, no one solution will entirely prevent the spread of invasive species or eliminate the harms caused by those already introduced. Current efforts of the federal and state governments require increased coordination and consistency to truly close the gaps in the regulatory framework surrounding sales of invasive species. A lack of education and resources is also preventing the laws that do exist to be adequately enforced.

There are many barriers to reducing the spread of invasive species, both aquatic and terrestrial. The primary barriers are:

- Incomplete and inconsistent legal frameworks at the state and federal levels which creates confusion and regulatory gaps;
- Illegal use of mail by parties of a transaction, either intentionally or unintentionally;
- Unclear legal burdens and liability for the parties to an e-commerce transaction of aquatic invasive species; and
- Lack of resources and availability for monitoring and enforcement of AIS laws.

The fairly robust state legal frameworks that already exists for AIS, as well as the nature of the impediments to their enforcement at the current time, suggest that progress on this issue cannot be achieved by simply enacting more laws or providing for more law enforcement officers. Instead, tackling the problem likely requires consideration of more innovative outreach strategies or incentives to increase compliance with existing laws. This document, along with the AIS Survey distributed in 2022, are not meant to be a comprehensive analysis of all facets of the AIS in E-Commerce discussion. Instead, they are merely designed as a starting point upon which Summit participants may build in the coming months.