

**RETAILER PERSPECTIVES
ON INVASIVE CRAYFISH
IN THE GREAT LAKES**



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Invasive Crayfish Collaborative
Great Lakes



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INTRODUCTION

Invasive crayfish in the Great Lakes region

Invasive crayfish greatly threaten the Great Lakes region and are considered one of the most impactful aquatic invasive species (Lodge et al., 2000). Due to their aggressive behavior and rapid growth, invasive crayfish have been found to drastically reduce macrophyte density, outcompete native species, shift food webs, alter habitats, and carry diseases (Baldrige and Lodge, 2014; O’Shaughnessey and Keller, 2019; McCarthy et al., 2006; Panteleit et al., 2019). Along with ecological impacts, invasive crayfish may also damage physical habitats via erosion and bank collapse due to their high burrowing activity (Faller et al. 2016). Preventing the introduction and spread of invasive crayfish to new waterbodies is a goal of local, state, and federal agencies.

Pathways of crayfish introduction

Non-native crayfish can be introduced to new bodies of water through various pathways and vectors. Invasive crayfish species have frequently been introduced through human activities including through organisms-in-trade (OIT) pathways (i.e., organisms sold for use in aquaria, gardens, schools, or as live bait or food). These pathways have been significant contributors to the spread of invasive crayfish, with several species often imported for use in aquariums and water gardens. Accidental releases and escapes from aquaculture facilities have also played a role in their introduction and spread. Further, live crayfish are commonly used as fishing bait and are sometimes discarded directly into new locations. These “bait-bucket” introductions are thought to be one of the most common mechanisms by which invasive crayfishes are introduced (Ludwig and Leitch, 1996). A less common but still significant vector of introductions includes the use of non-native crayfish in educational settings such as schools. The invasive red swamp crayfish (*Procambarus clarkii*) and rusty crayfish (*Faxonius rusticus*) are common in biological supply kits used by teachers for science lessons. Following their use in classrooms, crayfish may be accidentally or intentionally released into nearby waterbodies or given to students as pets (Larson and Olden 2008).

Challenges addressing organism-in-trade (OIT) pathways

OIT pathways include some of the most probable ways through which new species are introduced. Thus, addressing these pathways is crucial to preventing the spread of invasive crayfish. However, multiple challenges exist when trying to address these pathways. Studies have found that consumers look to retailers for information about crayfish (Seekamp et al. 2016) and retailers, in turn, look to wholesale distributors for their own information (e.g., compliance with prohibited species regulations). Therefore, there are many points at which information can be lost when travelling through the supply chain from wholesalers, to retailers, to consumers. Additionally, because crayfish are not regulated at the federal level in Canada or the United States (i.e., each Great Lakes state and province has their own regulations and laws), the lack of regulatory uniformity in the Great Lakes basin may cause confusion among stakeholders and make the entire basin vulnerable to invasion (Peters and Lodge 2011).

PROJECT GOALS

Because consumers in OIT pathways who purchase live crayfish from aquarium, bait, and food retailers have been found to be the most likely sources of crayfish introduction in parts of the Great Lakes basin (Smith et al 2018), understanding the extent of knowledge about invasive crayfish within the supply chain (e.g., regulations, sources, species, uses) is crucial to developing targeted outreach and education programs. Here, we build upon Smith et al. and other studies to enhance our understanding of the trade of invasive crayfish in the Great Lakes.

We conducted a telephone survey of OIT retailers that currently sell crayfish to obtain data on the sale, use, and sources of crayfish in their shops. We also examined retailer sentiment regarding crayfish conservation, aquatic invasive species, and environmental stewardship. The objectives of our survey included: (1) determining common species, sources, and uses of crayfish in OIT shops; (2) understanding how and where retailers receive their information about invasive species; (3) identifying and connecting the network of crayfish suppliers and distributors to disseminate future outreach programming; and (4) examining retailer beliefs on issues surrounding invasive species, Great Lakes ecosystems, environmental stewardship, and regulations.

METHODS

We compiled a database of 617 OIT retailers including bait shops, aquarium/pet shops, food retailers/restaurants, plant nurseries/water gardens, and wholesalers/distributors from the eight Great Lakes states (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin, USA) using internet search engines such as Google and Yelp. These retailers were chosen as their online description indicated that they may sell aquatic organisms including crayfish (note: not all retailers were found to currently sell crayfish). The contact information and location of these shops are listed by state in Appendix I and are current as of January 2024 (Tables 1-8). Using this database, we contacted 123 retailers in all Great Lakes states except for New York and Pennsylvania during June and July 2023 (Fig. 1A) including 74 aquarium shops, 10 plant nurseries, and 39 bait shops (Fig. 1B). More than half of the retailers contacted were aquarium and bait shops located in Illinois and Indiana due to ongoing outreach work by Illinois-Indiana Sea Grant in this region. The 123 retailers were contacted based on personnel capacity available to conduct surveys. No wholesalers were contacted for the survey. We provide a list of six online retailers in Appendix I (Table 9), but they were also not contacted for the current survey.

CRAYFISH RETAILER SURVEY REPORT

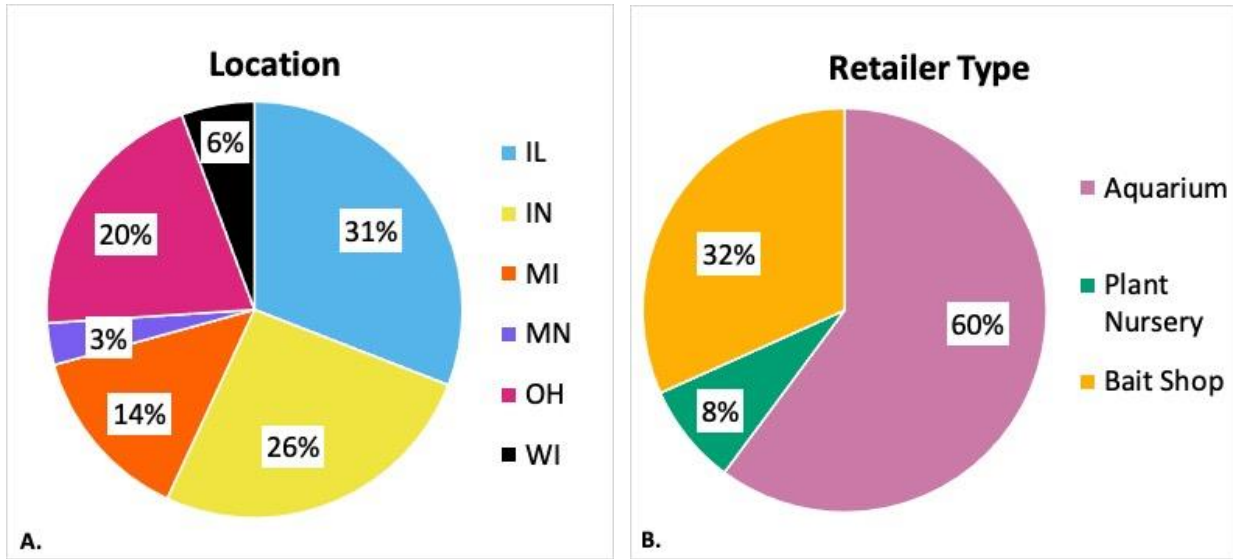


Fig. 1. Distribution of the 123 retailers contacted for the survey by A) Location (state) and B) Retailer Type.

The owners or managers of each retail shop were surveyed over the telephone, with the exception of one survey conducted in-person and one completed through email. A script of 18 questions approved by the Institutional Review Board of University of Illinois (Appendix II) was used to address the retailers' business practices with crayfish, thoughts on invasive species and the environment, and retailer needs for outreach. Responses were recorded in Qualtrics. The survey took approximately 20 minutes to complete and was completed by 16 of the 123 retailers who were contacted. All 16 of these retailers reported selling live crayfish. These retailers were located in Illinois, Indiana, Minnesota, Ohio, and Michigan (Fig. 2A) and only two of the 16 were classified as a bait shop (all others were aquarium retailers, Fig. 2B).

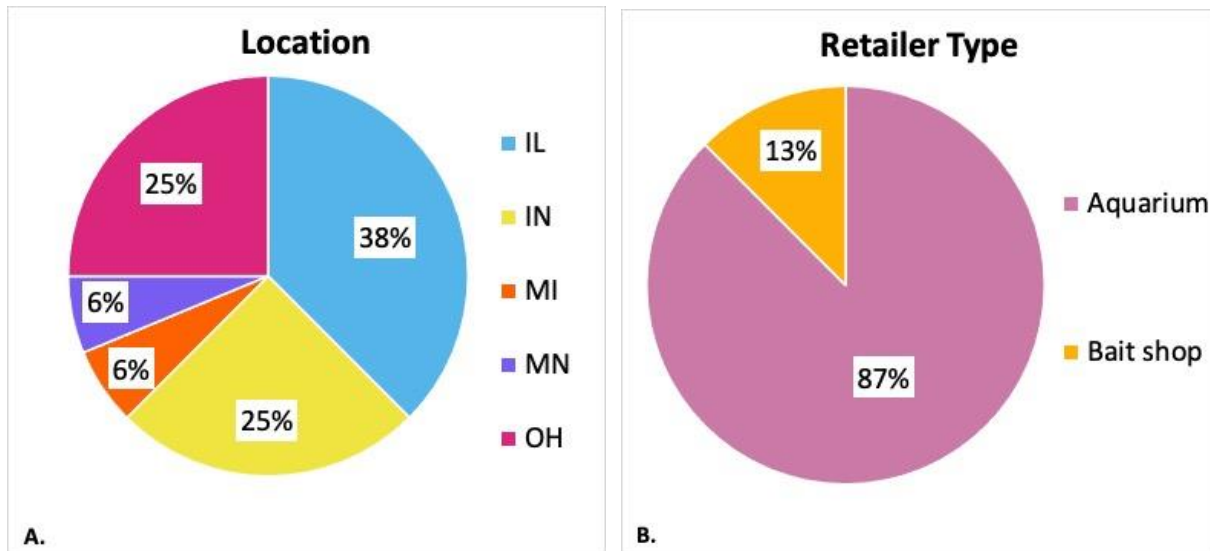


Fig. 2. Distribution of the 16 retailers who completed the survey by A) Location (state) and B) Retailer Type.

RESULTS

Of the 123 shops contacted, 32 responded that they sold live crayfish at some point during the year, while 12 did not respond to the question. The remaining 79 who responded that they did not sell crayfish were further asked to provide potential sources where crayfish could be obtained in their areas. More than half of the respondents did not know of a retailer they could refer to the surveyor. A common reason given by retailers in multiple states was that the sale of crayfish is illegal and only a few legal suppliers (also referred to as wholesalers or distributors) exist. In Wisconsin, for example, a retailer reported that crayfish cannot be used as bait for fishing and there is a ban on their import. Additionally, a retailer commented that crayfish cannot be transported into their state (Minnesota). One retailer reported being previously fined for selling an invasive crayfish species that closely resembled a native crayfish species. Retailers generally noted frequent changes to regulations covering additional species and strict enforcement by various state Departments of Natural Resources (DNRs). As such, the general trend among retailers has been towards stopping the sale of any crayfish. The increasing bans and regulations have resulted in fewer crayfish suppliers and retailers reporting not being able to obtain live crayfish for variable periods of time, ranging from a few months to several years, depending on their location. In addition to the limited availability of crayfish, another common reason why some retailers reported no longer selling crayfish was the difficulty in keeping them. Crayfish typically cannot be kept in aquaria with fish, and they tend to die quickly. Of the 70 retailers who responded to our request for potential sources of crayfish, over 15% reported selling crayfish in the past but not presently due to the reasons mentioned above.

General recommendations for where crayfish could be purchased included aquarium stores and bait shops. A few retailers suggested purchasing crayfish from fish farms or hatcheries, some of which serve multiple states in the Great Lakes region. Areas around Lake Michigan were also suggested by some as a common location for crayfish retail stores. While some retailers suggested visiting local bait shops for crayfish, others reported that bait shops have stopped selling them which has contributed to the overall scarcity. One retailer suggested exploring larger chain pet stores such as Petco and PetSmart, as they may have their own supply. They further added that bait shops need a license to hold more than 100 crayfish, and due to their limited sale, keeping them in stock was often a hassle. Despite this, live crayfish are still in high demand by some consumers, and local bait shops were a common recommendation to purchase crayfish.

A few respondents suggested buying crayfish online, including one respondent who mentioned the issue of illegal sale through eBay. Specific retailers or wholesalers were also suggested, many of which are included in Appendix I. Additionally, respondents suggested purchasing crayfish from states outside of their own, including Louisiana, New York, California, and Kentucky; however, they were uncertain about the regulations within these states as well as the regulations within their own state. Finally, some respondents suggested the option of trapping crayfish in local creeks, and one retailer suggested an Asian (Vietnamese) food store in Illinois.

Overall, respondents exhibited varying levels of knowledge regarding crayfish species they sold and their regulations within OIT pathways. While some individuals were aware of specific bans on invasive crayfish species (e.g., rusty crayfish in Illinois), others lacked the knowledge to differentiate the natives from non-natives. All participants emphasized that DNR websites serve as reliable sources for obtaining information on invasive crayfish. Specific survey questions and their detailed responses are discussed below.

Crayfish sales in the Great Lakes

What purposes do your business sell crayfish for and who are your main consumers?

Pet owners, fish hobbyists, and occasionally anglers comprised the majority of customers buying crayfish from surveyed retailers. Half of the surveyed retailers reported that they sell crayfish exclusively for use as aquarium pets. Ghost electric blue crayfish and dwarf Mexican crayfish (also sold as Mexican mini-lobster) are two popular varieties of ornamental crayfish that retailers reported selling, and were also mentioned to be a good way to keep tanks clean. Other purposes for which crayfish were sold included as bait and to feed other organisms. When used as bait, survey respondents shared that the main target was often catfish, while feeder crayfish such as Alpine Mountain crayfish were mostly purchased for use with predatory fish such as cichlids, piranhas, and puffers. An aquarium retailer added that while they mostly sold crayfish for ornamental purposes, anglers occasionally purchased them for bait due to low supply in local bait shops. Another aquarium retailer added that they cannot control if individuals who bought crayfish from their shop used them for different purposes, such as for fishing or classroom lessons. For example, a retailer from Michigan (not among the 16 who completed the survey) shared that crayfish were also commonly purchased from their store by elementary schools for educational purposes. The use of non-traditional and unregulated shops as sources of crayfish for consumers was also found by Smith et al. (2018), and therefore poses a concern for management of invasive crayfish.

How does your business sell crayfish and do you sell outside your state?

Most retailers indicated that crayfish sales primarily took place in brick-and-mortar stores where they were sold directly to the customers. At aquarium shops, each crayfish typically came with a list price. After the customer selected the crayfish they wanted to purchase, employees packed the animal into a bag and provided the customer with acclimation instructions to take home. One of the two bait shops surveyed shared that they sold crayfish by piece. While retailers believed that most of their customers were from in-state, it is not typically possible to determine when and how often customers visit from out-of-state, and thus, may potentially be breaking interjurisdictional transport regulations. Only one of the retailers surveyed reported that they sold crayfish online. All other retailers said that they did not sell crayfish online and do not ship to other states. However, as stated previously, multiple retailers mentioned that there exist several online platforms to buy crayfish.

What type of crayfish do you sell and what name do you sell them as? Do you ever use their scientific name?

The specific species of crayfish sold by a retailer varied among stores and was dependent on the intended use (i.e., pet vs. bait). Knowledge about different crayfish species and their scientific names also varied widely among the retailers. While most retailers were familiar with common names, few retailers knew scientific names and used them during the survey. Overall, it was common practice for retailers, regardless of their own familiarity with scientific names, to refrain from using scientific names to avoid confusion among customers. Retailers who sold 'feeder crayfish' (any number of species) labeled them as 'baitfish', 'feeder crayfish', 'crawdads', or simply 'crayfish'. In aquarium stores, labelling the species by color morph such as 'electric blue', 'tangerine', 'orange', 'white', 'vanilla', 'ghost' or as 'ornamental' was a common approach. Two crayfish species common in the aquarium trade, *Cambarellus patzcuarensis* and *Procambarus alleni*, were often labeled as 'Dwarf Mexican Orange Crayfish'

and ‘Electric Blue Crayfish,’ respectively. Another labeling approach followed by retailers was based on source location. For example, one retailer that sourced crayfish from Florida labeled them as ‘Florida Crayfish’. Retailers mentioned that they tended to use the same names as used by their suppliers. An aquarium retailer remarked that they use the scientific name for ‘Dwarf Mexican Orange Crayfish’ (*C. patzcuarensis*) but do not use scientific names for other species because of inaccurate or uncertain identifications. This was observed in other retailers as well, as only one retailer knew the correct scientific name for ‘Dwarf Mexican Orange Crayfish’. One Michigan retailer mentioned that they bought their crayfish from the state to avoid accidentally purchasing the invasive *P. clarkii* or *F. rusticus* from wholesalers. A retailer from Illinois reported selling ‘Swamp’ or ‘Marsh’ crayfish and referred to the species as *P. clarkii*.

Do you sell crayfish seasonally or year-round? How do you obtain the crayfish that you sell?

Most of the surveyed retailers sold crayfish year-round but noted that it was largely dependent on availability from their suppliers since crayfish are generally more available in the spring and summer. Four retailers stated that they only sold crayfish seasonally, mostly in the months of May and June. Availability of crayfish in stores can be unpredictable as some retailers carry them on request and consider other factors such as their price and availability of space in-store to hold them. Additionally, a retailer noted that climatic conditions (i.e., a drought and high temperatures) had slowed sales, potentially due to crayfish inactivity or deeper burrowing. When asked about the source of crayfish, most retail stores said that they obtained their crayfish from wholesalers or distributors. While some retailers received crayfish from local suppliers along with their weekly shipments of other freshwater animals, other retailers received their crayfish from areas outside of the Great Lakes basin such as Florida and Georgia. One retailer noted that their ‘Electric Blue Crayfish’ were raised in Florida and captive-bred, and another retailer reported that they received crayfish from a hatchery in Indiana. To the best of our knowledge, there are no crayfish aquaculture operations in the Great Lakes. However, some regional farms sell them as a byproduct of their operations, primarily because they consider crayfish a nuisance in their ponds.

Views on invasive species, the environment, and regulations

What do you feel are people's role in the natural world/the environment?

All retailers shared the sentiment that protecting the environment is an essential duty of humans and that humans have an inherent obligation to maintain the balance in nature and keep the environment habitable. Some retailers suggested promoting aquaculture to avoid disturbing natural populations of aquatic species. Two retailers said that while they believed that humans should live harmoniously with the environment, they did not think it was possible to convince everyone to take necessary precautions for preserving the environment. As the environment is affected by the collective actions of the public, a need to know more and do more to protect the environment exists. One retailer mentioned that they taught aquarium hobbyists about the environment by comparing the similarities between the ecosystem in a tank and ecosystems outside the tanks. Retailers also reflected upon the importance of water and supporting rivers and other aquatic resources. For example, one retailer talked about sustainable harvesting and suggested that crayfish harvesting should be done in a way that ensures the crayfish populations remain abundant for everyone to enjoy. Another participant highlighted the issue of phosphate contamination in freshwater ecosystems and the harm to wildlife. Other retailers discussed topics related to biosecurity and habitat destruction, expressing the need to

be cautious about accidental introductions of invasive crayfish to prevent their negative impacts on aquatic wildlife and the environment.

In further discussions on the issue of invasive species in the environment, there was a consensus among retailers that invasive species pose an environmental threat, although which species were considered ‘invasive’ varied among retailers. Some retailers cited the examples of northern snakehead (*Channa argus*) and invasive carp (referred to as ‘Asian Carp’ by retailers). One retailer believed that invasive crayfish are not a concern because larger fish can consume them, and two retailers believed that invasive crayfish are only a concern for southern Great Lakes states because they believe most crayfish are unable to survive in cold temperatures. Another two retailers said invasive crayfish could be a concern locally depending on the species (e.g., marbled crayfish and red swamp crayfish). While some retailers expressed their thoughts that anthropogenic actions (i.e., exotic pet trade) greatly contribute to the invasive species problem, many shared the sentiment that clearer communication from authorities as well as greater education for the public is needed. Many emphasized that while it is impossible to get rid of all invasive species, stricter regulations could help mitigate damage to the environment. One retailer shared a personal experience of encountering inconsistent enforcement of rules on invasive species while traveling between the U.S. and Canada and mentioned the large difference in priorities between the two countries. Conversely, another retailer believed that invasive species should be addressed on a state-by-state basis due to the differences in climate and habitat in each state. One retailer highlighted the need for more research before classifying a species as ‘invasive’. Only one respondent strongly opposed the notion of invasive species being an issue, blaming the media for it.

***Do you feel like invasive species are a risk to the Great Lakes economies or ecosystems?
Why or why not?***

Further exploring the issue of invasive species in the Great Lakes, survey respondents were asked whether they believed invasive species are a threat to Great Lakes economies and ecosystems. A majority of respondents (62.5%) answered ‘Yes’, while 18.75% each answered ‘No’ or ‘Maybe’ (Fig. 3). Those who responded ‘Yes’ cited invasive carp, zebra mussels (*Dreissena polymorpha*), and round gobies (*Neogobius melanostomus*) as examples of invasive species threatening the Great Lakes and provided insights into their impacts. The impacts discussed included the effects on native aquatic species (including aquatic vegetation) and habitat degradation. One retailer expected higher economic impacts for retailers that rely on native species, and another anticipated that invasive species would have some impact on the fishing industry. An aquarium retailer highlighted their personal efforts to educate customers, including advising them to never release their pet goldfish into the wild. Some respondents further discussed the implications of invasive species impacts by providing examples of regulatory actions taken, such as the banning of moss balls in the aquarium trade to prevent accidental zebra mussel introductions.

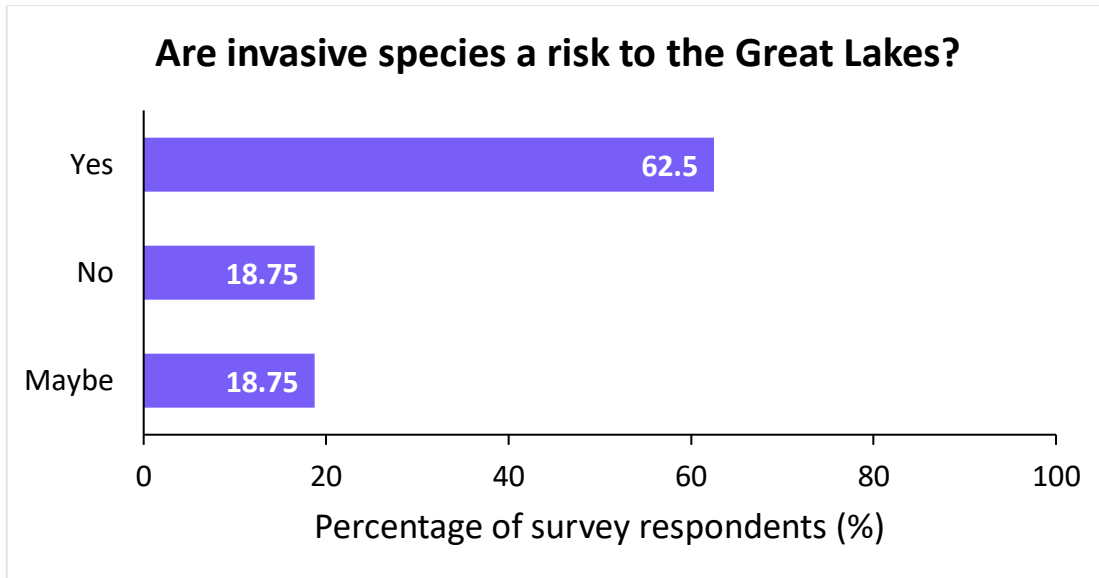


Fig. 3. Survey respondent responses to ‘Are invasive species a risk to the Great Lakes?’ (n=16)

In contrast, some retailers expressed their belief that not all invasive species pose a threat to the Great Lakes, and that impacts would vary by species. Among all crayfish, a retailer pointed to only the marbled crayfish as being a threat to the Great Lakes. Another retailer expressed that invasive crayfish and invasive carp are not a problem because they are edible. This retailer had considered other species resembling what they considered to be an eel or a snake (although not explicitly stated by the retailer, it is possible that they were referring to sea lamprey, *Petromyzon marinus*) to be a bigger issue in the Great Lakes. With respect to the economics of aquarium trade, one retailer explained that they would not be affected if they were unable to sell a particular crayfish species, as there are other similar-looking large shrimp and other organisms that are also in high demand and legal to sell. Another retailer believed that pollution (i.e., chemical discharge into waterways) posed a much bigger threat to the Great Lakes compared to invasive species.

What are your thoughts on the roles and responsibilities of businesses along the supply chain as they relate to invasive crayfish?

Roles and responsibilities for preventing the spread of invasive species were identified for different parties in OIT pathways. About a quarter of the surveyed retailers felt that wholesalers were most responsible for preventing the introduction of invasive crayfish, and therefore the effect of preventing the wholesalers from selling invasives would directly trickle down to the retailers. Many retailers shared that they had not been able to sell crayfish for months as their suppliers no longer carry them due to state restrictions (e.g., in Illinois), highlighting the role of wholesalers in preventing invasive species from spreading. One retailer shared that while they were not familiar with the operations of large fish farms and the safety practices they follow, they expected large suppliers to take greater responsibility in controlling the spread of invasive species.

Other retailers felt that the retail stores are equally responsible for controlling the spread of invasive species. Responsibilities identified for retail stores included: 1) Refraining from carrying species that can outgrow their tanks, 2) Training store employees to educate customers about the risks of releasing unwanted animals into the wild and encourage them to contact the store for alternative options, and 3) Understanding the laws and regulations around invasive crayfish as they vary state-by-state. For example, a retailer shared that crayfish were considered invasive in Illinois, but not in Indiana, Georgia, and Kentucky (i.e., locations from where they sourced their crayfish). Another responsibility identified for retailers was to provide information to customers in a transparent manner, such as the species' native range and impacts, for all species of crayfish at time of sale. One pet store retailer shared that they only typically sell about 25 crayfish per year, and therefore, they believed that pet shops contribute marginally to the crayfish supply chain among all retail types. The same retailer also expressed their belief that bait shops and food markets likely play a more substantial role as they facilitate larger sales volumes, citing the example of northern snakehead introduction, where pet shops were initially accused of spreading the invader. It was later revealed that Asian grocery stores played a larger role in their dissemination. A different retailer also shared the view that crayfish are invasive in the region only because of their importation from China.

In addition to wholesalers and retailers, one retailer expressed that customers also bear responsibility in the spread of invasive species. They further explained that once a customer buys an animal, retailers can only play a limited role afterwards, if any at all. Even if both distributors and retailers abide by the regulations and do not sell invasive crayfish, customers can purchase them from a vendor online. This retailer further explained that in cities that have transient populations (e.g., those with university campuses), individuals may take their pets (e.g., crayfish) with them when they move out of state, for example, after graduation. Therefore, customer education at the time of sale is a key responsibility of businesses.

What are your thoughts on regulations on what you can sell?

Retailers were asked to share their opinions on regulations given that they play a key role in preventing the introduction and spread of invasive species. Smith et al. (2018) found that the sale of the invasive red swamp crayfish increased in retail shops following the implementation of a ban in Michigan. Over 75% of our survey respondents believed that regulations are necessary for addressing all invasive species, and they expressed willingness to comply with rules established by state and federal agencies. However, several challenges to adopting regulations were shared: 1) There is no incentive for retailers to self-report accidents or hitchhikers in shipments, and that there should be some kind of compensation in place for business owners when they have to destroy or confiscate shipments because of accidents or hitchhikers, 2) Regulations are very technical, vary state-by-state, and can be difficult for non-experts to understand, and 3) Regulations change frequently with inadequate and inconsistent communication. Despite these challenges, retailers expressed their belief that regulations ultimately provide more benefits than drawbacks and remain essential for preventing invasive species introductions. A retailer also suggested a change to the license fees, noting that regulations are weak due to the low fees.

Nearly a quarter of retailers believed that blanket regulations cannot exist, and that regulations need to be species-specific. Upon further questioning, these respondents clarified that while they did not have an objection to regulations for species that are truly invasive, they believed invasive fish were a bigger environmental concern compared to crayfish, and therefore, regulation of crayfish sales may be unnecessary. One retailer explained that they sell responsibly, and because 'tropical species' cannot

survive in the Great Lakes region, they do not present an environmental concern. Another retailer noted that they were against rusty crayfish as pets and only sold them as feeders. They further explained that it is only when the crayfish are sold as pets can they become an issue. Another retailer, however, noted the potential benefits of the aquarium hobby for humans, noting that it can serve as a therapeutic outlet for veterans and individuals with post-traumatic stress disorder. Since sales of crayfish are generally low relative to other organisms, retailers expressed that regulations on crayfish sales would not substantially impact their store's revenue, although this may not be true for crayfish wholesalers or breeders.

Outreach for invasive species

How and where do you get information about invasive species?

Retailers were asked for sources of information about invasive species to aid in conducting effective outreach about aquatic invasive species in the Great Lakes region. Overall, about half of respondents reported that they get information directly from their state's DNR through regular emails and occasional store visits, and half reported that they do their own independent research by reading news articles and other scholarly articles on the internet. In addition to state DNRs, other state agencies such as Departments of Agriculture were also listed as sources of information. All retailers reported getting information from multiple sources at any time, and other sources of information included contacts in state agencies, distributors and vendors, and, in one case, even their customers. Two extension programs were also identified as sources of information: 1) the Reduce Invasive Pet and Plant Escapes ([RIPPLE](#)) program by Michigan State University, and 2) outreach materials by Sea Grant and Indiana DNR.

What could Illinois-Indiana Sea Grant (or others) do better to provide you with invasive species information?

When asked what kinds of educational materials they would find helpful, some retailers felt content with the existing resources available online from their state agencies and other sources. One retailer criticized only using trade journals as a source of information due to their national or international focus that may not take regional or local concerns about invasive species into consideration. Others offered the following specific suggestions:

1. **Education for crayfish distributors and retailers:** Retailers suggested agencies provide information packets to crayfish distributors and retailers with materials about why invasive species are harmful, lists of native and invasive crayfish with images, and pictures of crayfish species prohibited and their lookalikes with differences indicated clearly. As businesses may buy directly from distributors online, education of distributors is important so that they can appropriately advise their customers.
2. **Education for the public:** Retailers thought it was important to educate the public about the impacts of different invasive species, and most importantly, that this education needs to be accessible.
3. **Education on invasive plants:** Retailers wanted clear, concise, and reliable information about invasive aquatic plants to be in a single place. A DNR website was suggested as a platform where this information could be hosted for easy access to all.

4. Constant communication with retailers: Retailers suggested that quarterly or yearly updates from the state agencies, perhaps in the form of a newsletter, with clear and concise communication on prohibited species would be extremely helpful compared to browsing the vast amount of information available online from various sources.
5. Public signage: While signs with information about which species can be harvested can be seen around lakes, retailers suggested that signs advising people to be on the lookout for particular invasive species (e.g., rusty crayfish) would also be helpful.
6. Participation in pet advisory council: A retailer suggested sharing information with various pet store owners through participation in pet industry organizations such as the Pet Advocacy Network.
7. Government wholesalers: Retailers thought that having a government supplier of crayfish would be helpful to ensure that shops only carry the species that can be legally traded in their region.

Would you participate in outreach programs that would provide your consumers with information about invasive species? Any reason why or why not? Can you see any other opportunities for your business to participate in invasive species education efforts? If so, can you give an example?

Retailers were generally supportive of outreach events either because of their own personal interest in crayfish or because they believed these events would serve as a source of information for their customers (Fig. 4). To quote one retailer, “Knowledge is power and crayfish are awfully interesting”. Current ongoing efforts retailers reported included participating in a club and providing educational materials from the DNR to their customers. One store issued a regular newsletter to educate its employees on various species, which employees found useful when talking to customers. This store suggested printing these species spotlights and posting them around the store. Retailers currently not involved in outreach expressed interest in sharing educational materials including pamphlets in store as well as putting up signage. A retailer suggested outreach events arranged by professionals from environmental organizations, in addition to store employees, could further their efforts. Another suggestion was to designate drop-off locations for pet owners to bring unwanted species to prevent their release into the environment.

Those retailers who answered that they could not support outreach events at present typically reported that they did so because of either a lack of time, space, knowledge, opportunities for customer awareness besides in-store interactions, a large crayfish customer base, authority in store management decisions, or a combination of these reasons. One retailer reasoned that since they did not carry many potentially invasive species, they did not see merit for either the store or its customers in supporting any outreach.

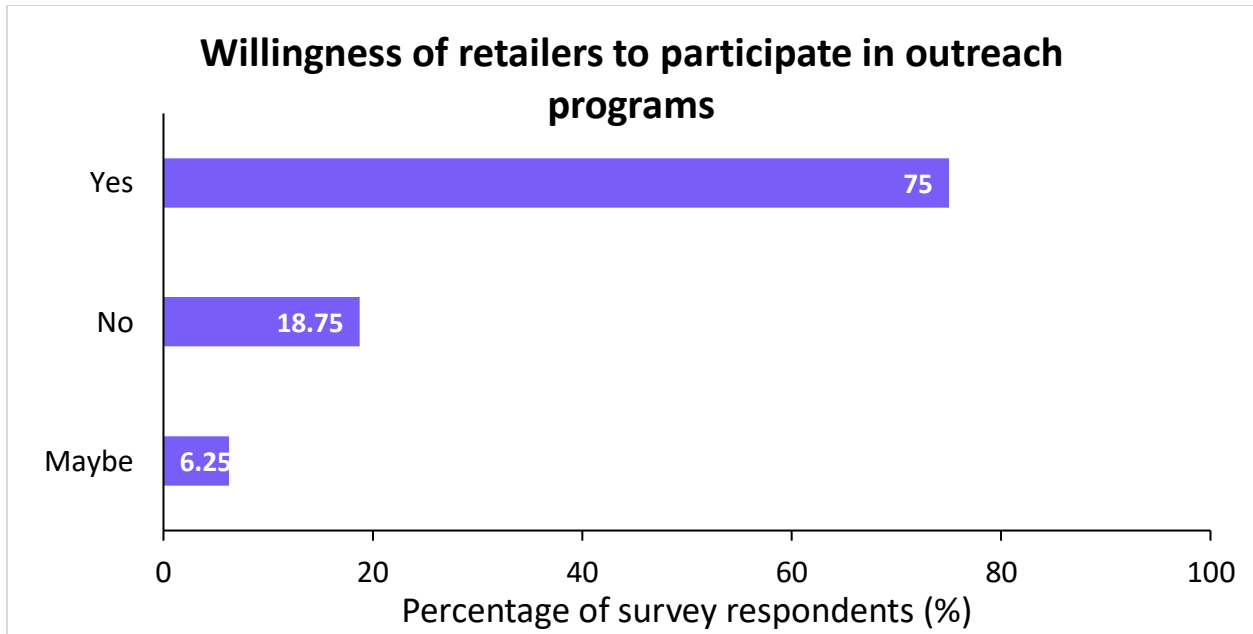


Fig. 4. Survey respondent responses to ‘Are you willing to participate in outreach programs?’ (n=16)

CONCLUSION

The insights gained from this survey of crayfish retailers in the Great Lakes states underscore the complexities surrounding invasive crayfish management in the region, and the importance of effective communication and education to mitigate the threats posed by invasive crayfish. These findings are likely to be of relevance to natural resource managers and outreach professionals working to address the threats posed by invasive crayfish. The reliance of retailers on wholesalers, distributors, and suppliers for information shows a critical need for increased outreach efforts directed towards these groups. The observed inconsistencies around invasive species identification, impacts, and terminology underline the necessity for outreach materials to provide specific information on species identification, pathways, and impacts. Moreover, the demand for clear and consistent communication regarding regulatory changes emphasizes the importance of creating and maintaining open channels of information exchange between the regulatory agencies and the retailers.

It is also important to acknowledge the limitations of this study. The small sample size (n=16) consisted predominantly of aquarium shops, which limits the generalizability of the findings to other types of crayfish retailers such as food markets. Additionally, the incomplete representation of all the Great Lakes states and Canadian provinces further emphasizes the need for working across jurisdictional boundaries to capture diverse perspectives. The challenges encountered in surveying retailers via cold-calling and phone surveys suggest that future research efforts may benefit from employing in-person surveys to foster trust with the retailer and supplier community. Moving forward, addressing these limitations and leveraging the identified future actions can help facilitate more effective strategies for efforts focused on invasive crayfish management and native species conservation in the Great Lakes region.

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APPENDICES

CRAYFISH RETAILER SURVEY REPORT

Appendix I – State-level list and contact details of aquatic organism retailers in the Great Lakes

Note: Although some retailers may be classified under multiple retailer types (e.g., they may be both an aquarium retailer and a plant nursery, or a bait shop and a wholesaler), only their primary retailer type is listed below. Not all retailers listed below sell crayfish, either currently or in the past.

Table 1. Retailers in IL

	Retailer	Phone Number	City
Food Retailers			
1	Assi Plaza	(847) 470-9450	Niles
2	Chicago Food Market	(312) 842-4361	Chicago
3	Chitown Fish & Seafood LLC	(773) 545-3474	Chicago
4	Dirk's Fish & Gourmet Shop	(773) 404-3475	Chicago
5	H-Mart Niles	(847) 581-1212	Niles
6	JC's Fish Market	(815) 708-7467	Rockford
7	Joong Boo Warehouse Market	(773) 478-2550	Chicago
8	Lian Sheng Market Inc.	773-954-1973	Chicago
9	Park To Shop Supermarket	(312) 846-1188	Chicago
10	Richwell Market	(847) 929-2228	Morton Grove
11	Robert's Seafood Market	(217) 546-3089	Springfield
12	Supreme Lobster & Seafood Inc	(630) 834-3474	Villa Park
13	Tai Nam Food Market	(773) 275-5666	Chicago
14	The FishGuy Market & Wellfleet	(773) 283-7400	Chicago
Aquarium Retailers			
15	Animal Island Pet Shop	(708) 293-0600	Midlothian
16	AquaCave.com	(847) 775-0640	Lake Forest
17	Aquamoon LLC	(833) 723-4635	Chicago
18	Aquanexus	(847) 628-5575	Elgin
19	Aquapros	(630) 935-1363	Glen Ellyn
20	Aquarium Adventure	(630) 739-1128	Bolingbrook
21	Aquarium Maintenance Done	(815) 341-1029	Villa Park
22	Aquariums Done Wright	(630) 352-8888	Downers Grove
23	Aquatic Oasis	(773) 595-3176	Chicago
24	Aquatic Paradise	(630) 300-8245	Lemont
25	Aquatic Realm Inc	(312) 642-8763	Chicago
26	Aquatic Solutions Inc.	(847) 951-3865	Schaumburg
27	Aquatic Works	(847) 564-9675	Northbrook
28	Aquatic World	(773) 935-2028	Chicago
29	Aquatica	(708) 633-7333	Tinley Park
30	Aurora Lagoon, LLC	(224) 458-4735	Chicago
31	Beyond the Reef	(847) 885-7333	Schaumburg
32	Big Fish Aquarium	(773) 295-5175	Chicago
33	Blue Line Coral	(630) 857-9166	Naperville
34	Blue Planet Aquarium Services	(773) 774-3474	Chicago
35	Chicago Discus	(312) 622-0055	Chicago
36	Chicago Fish and Coral Company	(708) 349-9055	Orland Park
37	Chicago Reptile House	(708) 349-9055	Orland Park
38	Chicagoland Aquariums	(815) 304-5666	Bradley

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39	Coral Reef Pet Center	(708) 456-0768	Norridge
40	Critters Pet Shop	(224) 856-5780	South Elgin
41	Datz Cichlids & Reptiles	(815) 271-5715	McHenry
42	Exotic Aquatics	(847) 854-6154	Lake in the Hills
43	Fish Help Chicago	(708) 691-4400	Chicago
44	Fish Island	(847) 704-2592	Barrington
45	Fish Planet	(847) 945-4700	Deerfield
46	Gingerbread Tropical Fish & Coral	(630) 857-9404	Naperville
47	Golden Aquarium	(773) 376-8355	Chicago
48	Hardy's Aquatics & Pets	(773) 840-3420	Chicago
49	Marine Concepts Inc.	(847) 344-2422	Wheeling
50	Namaka Aquatics	(224) 420-1835	Hanover Park
51	Nick's Reef	(847) 770-3065	Carol Stream
52	Oak Park Natural Pet and Fish	(708) 660-9500	Oak Park
53	Ocean Design Aquarium	(773) 625-3474	Chicago
54	Old Town Aquarium	(312) 642-8763	Chicago
55	Pet Supplies Plus	<i>Multiple</i>	<i>Multiple</i>
56	Petco	<i>Multiple</i>	<i>Multiple</i>
57	Petland Hoffman Estates	(847) 865-9331	Hoffman Estates
58	PetSmart	<i>Multiple</i>	<i>Multiple</i>
59	Prism Bettas		DeKalb
60	Rainforest Marine Aquatics	(773) 503-9048	Des Plaines
61	Reef Design	(630) 514-5948	Naperville
62	Reef Geeks of Chicago	(224) 723-5588	Northbrook
63	Reef Plus	(630) 906-7333	North Aurora
64	Reefwise	(630) 541-5486	Lisle
65	Rob's Aquatics	(708) 444-7627	Tinley Park
66	Sailfin Pet Shop	(217) 352-1121	Champaign
67	Sea Escapes Inc	(847) 695-9441	South Elgin
68	Sho Tank Aquariums	(847) 949-8265	Mundelein
69	Slice of the Sea, LLC	(708) 942-5012	Chicago
70	Snails to Tails Pet Center	(708) 387-9228	Brookfield
71	Something Fishy Inc	(708) 597-3474	Alsip
72	Tank it Easy	(312) 600-8265	Chicago
73	The Animal Store	(847) 675-5133	Lincolnwood
74	The Local Fish Store	(224) 247-2200	Morton Grove
75	The Little Reef Shop	(630) 541-7153	Downers Grove
76	Trident Aquatic Solutions	(815) 900-2283	McHenry
77	Tropi-Quatics Pet Center	(630) 953-2696	Lombard
78	Wojtek's Reef	(773) 837-5104	Chicago
79	Zooxae	(847) 780-1113	Elgin
80	2nd City Cichlids	(773) 417-3537	Chicago
81	650 Ocean's Reef Inc	(224) 857-8193	Palatine
Restaurants/Bars			
82	Big Jones	(773) 275-5725	Chicago
83	Boston Fish Market	(847) 296-1111	Des Plaines
84	Brownstone Tavern	(773) 528-3700	Chicago
85	Frontier	(773) 772-4322	Chicago
86	Maple Tree Inn	(708) 388-3461	Homewood
87	McGees Tavern	(773) 549-8200	Chicago

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88	Mr. Wang	(312)225-2882	Chicago
89	Reggies	(312) 949-0120	Chicago
90	The Angry Crab	(773) 687-9929	Chicago
91	Toons	(773) 935-1919	Chicago
Bait Shops			
92	Advantage Bait Company	(847) 772-9334	Elk Grove Village
93	Anglers International Resources	(847) 991-3200	Palatine
94	Badass Lures LLC	(630) 557-6373	Rockford
95	Bait Shanty	(847) 532-0260	Algonquin
96	Bunny's Bait Shop & 24/7 Vending Machines	(815) 288-3812	Dixon
97	Buschs Bait Shop	(847) 356-7537	Lake Villa
98	Country Corner	(847) 566-5770	Mundelein
99	Croegaert's Great Outdoors	(309) 788-4868	Rock Island
100	Crappie Pro Shop	(618) 985-8277	Carteville
101	Dave's Bait Tackle & Taxidermy	(815) 455-2040	Crystal Lake
102	Dicky's Bait Shop	(630) 675-4371	Montgomery
103	Drydock Bait and Tackle	(309) 627-2769	Gladstone
104	Elliots Bait and Tackle	(815) 304-4137	Kankakee
105	Fishing Connection	(708) 532-1476	Tinley Park
106	Fishing Tales Guide Service	(630) 732-5461	Campton Hills
107	Fishtech	(847) 966-5900	Morton Grove
108	Golden Bait Co	(309) 723-6381	Anchor
109	Green Acres Bait Shop	(217) 935-9015	Clinton
110	Hoss Hawg Bait	(309) 565-3241	Elmwood
111	Jon's Bait and Tackle Shop	(815) 237-2822	Gardner
112	Just Add Water Bait, Tackle & More LLC	(618) 964-1944	Marion
113	Lee's Bait & Tackle	(847) 593-6424	Elk Grove
		(630) 830-5337	Carol Stream
114	Live Bait Shack	(331) 229-9891	Plainfield
115	Louie's Lures	(888) 369-1999	Lindenhurst
116	Musky Tales	(847) 603-1248	Antioch
117	Park Bait Co	(773) 271-2838	Chicago
118	Sharky Spoons & Tackle LLC	(630) 673-2983	
119	SS Minnows Bait Shop	(847) 289-0135	South Elgin
120	The Bait Shop at Allen & Outboard Marine	(815) 761-1947	Shabbona
121	The Salmon Shop and the Great Outdoors	(847) 934-4050	Palatine
Plant Nurseries/Water Gardens			
122	Aquascape Construction	(630) 659-2057	St. Charles
123	Aquatic Nursery	(847) 741-7678	South Elgin
124	Heinz Brothers Greenhouse Garden Center	(630) 377-6288	St. Charles
125	Keystone Hatcheries	(815) 678-2537	Richmond
126	Koi & More Pond Shop	(847) 432-1350	Highland Park
127	Natural Water Gardens	(815) 235-7663	Belvidere
128	Picasso Ponds & Watergardens	(847) 493-9322	Franklin Park
129	Pond Boy Water Gardens	(630) 521-1997	Bensenville
130	Schaefer Greenhouses	(630) 896-1936	Montgomery
131	Wannemaker's Home and Garden	(630) 852-0700	Downers Grove
Wholesalers			
132	Apet Inc	(847) 586-5800	Carpentersville
133	Aquatics Inc	(708) 457-1454	Norridge

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134	Childers Fish Farm	(309) 565-3288	Hanna City
135	Gorham Fish Farm	(618) 763-4496	Fountain Bluff Township
136	Hatchery Creek Co	(309) 694-0375	East Peoria
137	Indian Trail Fish Hatchery	(573) 743-6215	Salem Township
138	Ken's Fish Studio	(815) 633-9434	Loves Park
139	Koi Whisperer Sanctuary	(630) 631-9566	St. Charles
140	Lake Julian Trout Farm	(847) 639-3734	Cary
141	Little Grassy Fish Hatchery	(618) 529-4100	Makanda
142	Richmond Fisheries	(815) 675 6545	Richmond
143	Ridgley's Fish Farm	(618) 683-4602	Golconda
144	Scoville Fish Hatchery	(847) 381-2888	Tower Lakes
145	Seven Springs Fish Farm & Lake Management	(618) 201-7686	Evansville
146	Shady Lane Fish Farm	(618) 584-3517	Flat Rock

Table 2. Retailers in IN

	Retailer	Phone Number	City
Aquarium Retailers			
1	Abyss Systems Inc.	(317) 913-1537	Indianapolis
2	Aquaricare	(317) 224-7875	Morgantown
3	Aquarium Concepts	(812) 434-7400	Evansville
4	Aquarium World	(765) 447-7371	Lafayette
5	Aquatic Arts	(317) 513-2967	Indianapolis
6	Atlantis Aquatic Gardens	(812) 232-7387	Terre Haute
7	Coralsedge Aquarium Mainenance & Set Up	(219) 331-5054	Valparaiso
8	DNA Aquatics	(574) 227-1600	Elkhart
9	Exotic Aquatics	(847) 854-6154	Highland
10	Exotic Aquatics and Pets	(260) 343-0300	Kendalville
11	Fins & Fangs	(812) 821-5677	Spencer
12	G and M Pet and Garden Center Inc	(765) 288-9931	Muncie
13	Goldfish Gardens	(317) 997-3474	Carmel
14	Greentree Pet Center	(812) 282-2594	Clarksville
15	Imperial Aquatics, Inc	(317) 670-7757	Indianapolis
16	J & K's Mega Pet!	(260) 563-0352	Wabash
17	Modern Aquatix	(317) 731-4116	Indianapolis
18	Northside Aquatics LLC	(574) 612-4416	Elkhart
19	Pat's Pets	(574) 272-5888	Mishawaka
20	Pet Supplies Plus La Porte	(219) 402-0100	La Porte
21	Petco	(219) 924-9219	Highland
22	PetSmart	(219) 942-5598	Hobart
23	Petware House	(260) 489-5151	Fort Wayne
24	Premium Aquatics	(317) 895-9005	Edinburgh
25	Rainforest Farms International	(812) 272-8668	Bloomington
26	Reptile Emporium & Aquatic Center	(219) 838-8149	Highland
27	Speck's Pet Supplies	(317) 272-7738	Avon
28	Summit City Coral	(260) 446-2041	Fort Wayne
29	Terry's Aquarium & Pet Center	(219) 931-6724	Hammond
30	The Ark Pet Shop	(219) 769-0661	Merrillville
31	The Reef Aquarium Shop	(317) 253-9695	Indianapolis
32	Uncle Bill's Pet Centers Fort Wayne	(260) 436-9900	Fort Wayne

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Bait Shops			
33	Adams Outdoor Bait & Tackle!	(317) 671-9029	Beech Grove
34	Bailey's Bait & Tackle	(812) 988-0585	Nashville
35	Bait Bucket	(812) 424-0670	Evansville
36	Baitmasters LLC	(219) 265-1777	Hobart
37	Bal-Hinch Country Store	(765) 866-1055	Crawfordsville
38	Beautiful Bud's Sports & Bait - South Blvd. Sports	(765) 362-0129	Crawfordsville
39	Big D's Bait & Tackle	(260) 665-8414	Angola
40	Big Jim's fishing and hunting gear	(812) 821-4660	Spencer
41	Big Ol' Mouth Baits	(260) 229-1640	Roann
42	Big Tales Fishing Tackle	(812) 547-0908	Tell City
43	Breezy Hill Bait Shop	(219) 253-8323	Monticello
44	Bruce's Bait Shop	(812) 665-9505	Jasonville
45	Buck & Dumb Bass Outdoors	(765) 795-2009	Cloverdale
46	Chief's Bait Shop	(219) 874-4086	Michigan City
47	Country Bait & Taxidermy Shop	(219) 464-9932	Valparaiso
48	Curtis Fisheries	(765) 342-6341	Martinsville
49	Cy's Tackle Shop	(574) 223-4370	Rochester
50	Double D Fireworks/Bass Lake Bait and Tackle	(574) 772-0229	Knox
51	Doyle's Bait & Tackle	(765) 481-2140	Lebanon
52	Fish On Tackle	(260) 571-5378	Wabash
53	Fishin Tales	(812) 530-9821	Seymour
54	Fishun' Frannies Custom Baits	(812) 359-0096	Ellettsville
55	Fletcher's Bait & Tackle	(574) 267-1622	Warsaw
56	Gary's Dam Bait Shop	(317) 364 6366	Edinburgh
57	Geneo's Hunting And Fishing	(765) 269-9246	Lafayette
58	Honey Creek Tackle	(317) 422-0102	Bargersville
59	Indy Bait & Tackle	(317) 362-4548	Indianapolis
60	Jays Midlake Bait.Tackle.Restaurant	(765) 458-7554	Liberty
61	Jordan's Bait Shop	(765) 397-1929	Kingman
62	Jr's Bait & Tackle	(260) 593-0233	Topeka
63	Kelley's Bait & Tackle	(574) 784-8859	Lakeville
64	KRB Bait & Tackle	(812) 247-3115	Shoals
65	Lake Cicott bait and tackle LLC	(574) 870-4435	Logansport
66	LBS Bait Shop	(317) 737-0138	Indianapolis
67	Lighthouse Bait & Tackle	(765) 287-8587	Muncie
68	Master Bait and Tackle	(765) 639-9525	Anderson
69	McCollough Taxidermy	(765) 655-3753	Greencastle
70	Morton Hook & Sinker Bait Shop	(765) 739-6566	Greencastle
71	My Bait Guy	(574) 603-0159	Logansport
72	Myers Bait & Fish Inc	(260) 475-5765	Pleasant Lake
73	Naptown Bait and Tackle	(317) 735-1147	Indianapolis
74	Nick's Bait & Tackle	(260) 508-0208	Albion
75	Number 1 Stop Bait & Tackle	(574) 594-2361	Pierceton
76	Outdoor World Jefferson Sportsman's Mall	(812) 254-9350	Washington
77	Ozark Fisheries	(800) 775-3474	Martinsville
78	Peacepipe Bait & Tackle	(260) 468-2768	Andrews
79	Premier Bait & Tackle	(574) 528-5005	Syracuse
80	Realistic Bait LLC	(219) 690-1765	Lowell
81	Red Barn Bait & Guns	(812) 883-6483	Salem

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82	S S Bait and Tackle	(260) 468-2551	Andrews
83	SCHMACK EM' Bait & Tackle	(574) 382-0350	Macy
84	Schwartz's Bait & Tackle	(317) 776-0129	Noblesville
85	Slez's Bait and Tackle	(219) 588-5929	Lake Station
86	Small Town Sports & Outdoors	(765) 938-4412	Rushville
87	Smiths Triangle Bait & Storage	(765) 458-7106	Liberty
88	Soremouth Tackle	(765) 507-5010	Kokomo
89	SSC BAIT & TACKLE	(812) 704-8205	Versailles
90	Stacy's Bait & Tackle	(574) 289-4559	Mishawaka
91	Stan's Bait & Tackle Center	(219) 315-0303	Hammond
92	Summit Lake Bait Shop	(765) 524-9700	New Castle
93	Tackle And Bait Shop	(574) 214-5214	Elkhart
94	Tackle Service Center	(317) 831-2400	Mooreville
95	Tackle Shack	(574) 825-0802	Middlebury
96	Ted's Bait Shop	(765) 492-9293	Kingman
97	The Fishin Shedd	(812) 837-9474	Bloomington
98	They're Bitin' Bait Shop	(812) 732-4800	Central
99	Track & Channel Outdoors	(574) 457-2490	Syracuse
100	Twin Lakes Fish & Game	(574) 583-6635	Monticello
101	U Save Bait Shop	(765) 654-4544	Frankfort
102	White River Bait & Tackle	(812) 388-7362	Williams
103	Woody's Spillway Camp & Bait	(765) 473-6702	Peru
104	Wormies Bait & Tackle	(812) 537-5839	Greendale
105	Ye Olde Tackle Box	(574) 834-2011	North Webster
Plant Nurseries/Water Gardens			
106	Alsip Home & Nursery	(219) 365-0882	St. John
107	Aquatic Design and Supplies, Inc.	(317) 996-3106	Monrovia
108	Backyard Blessings	(317) 899-5459	Indianapolis
109	Chesterton Feed & Garden Center	(219) 926-2790	Chesterton
110	Cool Ponds	(317) 786-3670	Indianapolis
111	Dennis Perennials	(219) 477-6704	Valparaiso
112	Majestic Water Garden LLC	(317) 793-8649	Mooreville
113	Niemeyer's Landscape Supply	(219) 663-1042	Crown Point
114	Rosie's Gardens and Hughes Landscape	(317) 844-6157	Carmel
115	Sounds of Water	(812) 246-0260	Sellesburg
116	Wasson Nursery & Garden Center	(765) 759-9000	Muncie
117	Water's Edge Gift, Garden & Pond Center	(708) 895-2554	Munster
118	3E Industries & Woodland Water Gardens and Nursery	(260) 244-0050	Columbia City
Wholesalers			
119	Kelly's Live Bait & Tackle Inc	(812) 442-9221	Brazil

Table 3. Retailers in MI

	Retailer	Phone Number	City
Aquarium Retailers			
1	A & M Aquatics	(517) 321-7258	Lansing
2	Aqua Blue Aquarium Solutions	(616) 560-6992	Grandville
3	Aquallations	(231) 943-2130	Traverse City
4	Aquarium Shine	(586) 634-0256	Rochester Hills

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5	Aquatic Angels	(810) 347-7924	Lansing
6	Aquatic Treasures/Bruces Pond Shop	(734) 479-5100	Brownstown Charter Twp
7	Atlantis Fish Shoppe	(248) 280-6900	Clawson
8	Beyond the Shore Aquatics	(231) 798-5557	Muskegon
9	Blue Fish Aquarium	(616) 667-2583	Grandville
10	Blue Thumb	(888) 619-3474	Saginaw
11	Campbell's Sunken Treasures	(734) 231-4027	Wyandotte
12	Clean Aquariums	(734) 249-8065	Monroe
13	Critter Pet Shop	(313) 383-9460	Allen Park
14	Dotty's Feed and Pet	(810) 742-2443	Burton
15	Dutch Family Reef: Aquarium Maintenance and Design	(616) 403-8473	Byron Center
16	Fantastic Fins	(734) 464-3523	Livonia
17	Fins & Filters - Pet Suppliers	(248) 887-1881	Highland Charter Twp
18	Fish Lady	(517) 625-4455	Morrice
19	Fishy Bizz	(248) 893-7892	Farmington
20	Goody's Pet Supply	(734) 728-5300	Wayne
21	Great Lakes Aquarium House	(269) 279-6023	Three Rivers
22	Greenwood Pets & Plants	(586) 200-3930	Warren
23	Highland Tropical Fish & Bird Haven	(248) 698-9090	White Lake
24	House of Pets Inc	(734) 421-5500	Garden City
25	IncrediPets Market	(248) 301-5154	Waterford Twp
26	Kee's Aquarium & Pets	(586) 739-9140	Shelby Township
27	Lake Michigan Cichlids	(269) 326-0546	Bridgman
28	Lou's Pet Shop	(313) 885-1560	Grosse Pointe Woods
29	M & M Pet Supplies Inc	(313) 882-3944	Detroit
30	M V Pets	(269) 492-7387	Portage
31	Michigan Tropicals LLC	(810) 513-4468	Flint
32	Moby Dick Pet Store Inc	(248) 673-2520	Waterford Twp
33	Oceans and Seas	(586) 778-2223	Roseville
34	Pet Connection	(734) 525-1270	Livonia
35	Pet Station Jackson	(517) 787-9050	Jackson
36	Pond Place of Michigan LLC	(248) 889-8400	Milford
37	Premier Pet Supply	(734) 855-4505	Livonia
38	Preuss Pets	(517) 339-1762	Lansing
39	Royal Aquariums Detroit	(734) 634-3000	Detroit
40	Royal Tropical Fish & Bird	(248) 541-6600	Royal Oak
41	Soldan's Pet Supplies	(989) 775-6900	Mt Pleasant
42	Something Fishy	(734) 722-4474	Westland
43	Stingray Bay	(586) 778-0547	Eastpointe
44	Tank Dreams	(517) 292-0046	Howell
45	The Fish Doctors	(734) 434-1030	Ypsilanti
46	Tropic Cove Pet Store	(231) 347-5970	Petoskey
47	Tropical Treasures	(586) 791-6595	Clinton Twp
48	Tropicorium Mini-Reef	(734) 782-2622	Romulus
49	V.I. Pets	(616) 281-3900	Grand Rapids
50	Watercolors Aquarium Gallery	(616) 667-2424	Grand Rapids
Bait Shops			
51	Andy's Tackle Box	(231) 477-5737	Brethren
52	Alexander's Bait & Tackle	(989) 883-9024	Sebewaing

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53	Baldwin Bait and Tackle	(231) 745-3529	Baldwin
54	Bay View Bait & Tackle	(906) 786-1488	Gladstone
55	Beckley's M-65 Bait Shop	(989) 756-3651	Whittemore
56	Bellaire Bait and Tackle	(231) 350-7126	Bellaire
57	Big Moe's Bait & Tackle	(313) 259-1176	Detroit
58	Bob's Bait Shop	(231) 885-1150	Mesick
59	Brenner's Sporting Goods	(616) 785-3388	Comstock Park
60	Buck Country Bait & Tackle	(231) 768-5653	Le Roy
61	Cary's bait tackle	(269) 282-1023	Battle Creek
62	Charlie's Marina Bait Shop	(231) 869-5000	Pentwater
63	Chuckies Bait and Tackle	(989) 493-0302	Essexville
64	Clear H2O Tackle Llc	(269) 414-4131	Edwardsburg
65	Dean's Bait & Tackle Inc	(989) 836-2460	Alger
66	Dip Net Live Bait and Tackle	(313) 388-5811	Ecorse
67	Don's Sporting Goods	(231) 723-5028	Manistee
68	Double L Bait & Tackle	(269) 649-9676	Vicksburg
69	Fish On Bait & Tackle	(616) 935-6985	Nunica
70	Fishermans Cave	(734) 848-3935	Erie
71	Fisherman's Headquarters	(231) 848-4242	Wellston
72	Fishin Hole	(269) 982-3474	St Joseph
73	Gordon's Live Bait	(989) 728-2961	Hale
74	Grand River Bait and Tackle	(517) 420-4183	Lansing
75	Great Lakes Tackle	(269) 208-6178	Benton Harbor
76	Hall's Bait & Tackle	(269) 641-2304	Union
77	Hank & Sons Tackle Store	(231) 477-5450	Brethren
78	Henry's Bait & Tackle	(231) 757-0101	Scottville
79	Hooked Bait & Tackle	(701) 590-9523	Gobles
80	Jeff's Bait & Tackle	(734) 289-4901	Monroe
81	Johnsons Great Outdoors	(231) 893-6688	Montague
82	Ken's Sport Shop	(269) 623-6565	Delton
83	Lake Leelanau Narrows Resort Bait & Tackle	(231) 624-6201	Lake Leelanau
84	Lakes Area Bait Shop	(248) 624-3333	Wolverine Lake
85	Lakeview Marine & Tackle	(616) 842-2770	Grand Haven
86	Livingston Lakes Live Bait and Tackle	(586) 218-0118	Brighton
87	Lyman's On the Lake	(989) 422-3231	Houghton Lake
88	MainstreamTackle & Outdoors	(269) 665-5076	Galesburg
89	Mac Baits	(616) 392-2553	Holland
90	Matts Bait -n- Tackle	(616) 557-3000	Sand Lake
91	Michigan Tackle, LLC	(269) 883-6457	Battle Creek
92	Michigan Wholesale Bait	(231) 330-3446	Alanson
93	Michigan Wholesale Bait Inc	(616) 887-7163	Sparta
94	Mick's Bait Shop	(906) 586-6040	Curtis
95	M 46 Bait & Tackle	(989) 576-1128	Riverdale
96	M-65 Baitshop II	(989) 646-2444	Au Gres
97	Outdoorsmen Pro Shop	(616) 457-3630	Georgetown Twp
98	Pappy's Bait & Tackle	(231) 848-4142	Wellston
99	Parsley's Sport Shop, LLC	(231) 652-6986	Newaygo
100	Rick's Bait Shack	(734) 449-8210	Whitmore Lake
101	Sadler's Great Outdoors	(989) 365-9559	Six Lakes
102	Schafer's Bait & Sporting Goods	(989) 644-3501	Weidman

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103	Shoreline Service Bait	(231) 759-7254	Muskegon
104	Tackle Haven	(269) 925-0341	Benton Harbor
105	TC Bait & Tackle	(231) 252-3088	Traverse City
106	The Bait and Tackle Box	(734) 301-3281	Trenton
107	The Bait Barn	(517) 278-9513	Coldwater
108	The Bait Shop	(248) 599-7788	Waterford Twp
109	Trenton Lighthouse Bait and Tackle Shop	(734) 675-7088	Trenton
110	Wendell's Wholesale Bait	(269) 367-4844	Woodland
Plant Nurseries/Water Gardens			
111	Apol's Water Gardens	(616) 698-1030	Caledonia
112	Aqua Creations Pond and Water Garden Supplies	(810) 715-1313	Flint
113	Aquatec Ponds LLC	(734) 994-7663	Ann Arbor
114	Backyard Oasis Pond & Garden Center	(810) 736-9198	Flint
115	Barson Greenhouse	(734) 421-5959	Westland
116	Bogie Lake Greenhouses	(248) 887-5101	White Lake Charter Twp
117	English Gardens	(586) 771-4200	Eastpointe
118	English Gardens Plymouth Nursery	(734) 453-5500	Plymouth
119	Grass Roots Pond & Garden	(734) 753-9200	New Boston
120	Green Wellies Garden Shop, LLC	(269) 471-4037	Berrien Springs
121	Lakeshore Aquascape	(231) 486-0077	Norton Shores
122	The Pond Guy	(586) 336-7663	Armada

Table 4. Retailers in MN

	Retailer	Phone Number	City
Aquarium Retailers			
1	A World of Fish	(218) 729-5161	Hermantown
2	Aqualand Aquarium Center	(612) 825-5666	Minneapolis
3	Aquatic Pets	(507) 663-1096	Northfield
4	Atlas Pet Supply	(855) 285-2726	Stillwater
5	Forest Lake Pets	(651) 464-8982	Forest Lake
6	Fragtastic Reef	(507) 304-2579	Mankato
7	Go Aquatics	(612) 379-1315	Minneapolis
8	Joe's Shrimp Shack	(952) 212-7913	Plymouth
9	New Wave Aquaria	(763) 710-9386	Plymouth
10	Northstar Aquatics Inc	(612) 208-3564	Savage
11	Pet Zone	(218) 751-4471	Bemidji
12	Premier Aquarium Service	(612) 243-1335	Minneapolis
13	Pure Fish Works	(651) 318-7376	Hastings
14	Quality Aquatics Pet Shop	(763) 780-3474	Circle Pines
15	Reef Collective	(612) 326-0557	New Brighton
16	Sea Level	(952) 933-2244	Minnetonka
17	Sonnen's Pet Shop	(651) 222-2425	St Paul
18	Tamed Waters	(651) 330-8077	St Paul
19	Twin Cities Guppies	(320) 587-3202	Maplewood
20	Uncle Earl's Pet Center	(952) 758-7297	New Prague
21	Wet World	(651) 686-8483	Eagan
Bait Shops			
22	Bait Shop	(952) 886-0604	Bloomington
23	Blue Ribbon Bait & Tackle	(651) 777-2421	Oakdale

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24	Buck's Bait & Tackle	(218) 772-0012	Crosby
25	DH Custom Rods & Tackle South	(952) 471-7637	Wayzata
26	Express Live Bait	(763) 795-0110	Spring Lake Park
27	Full Stringer Bait and Tackle	(218) 363-2031	Longville
28	Garrison Sports Bait and Tackle	(320) 692-4477	Garrison
29	JR's Tackle Fishing Tackle Outlet	(763) 424-8001	Brooklyn Park
30	Kathy's Live Bait	(651) 487-5766	St. Paul
31	Northwoods Bait and Tackle Inc	(218) 666-2639	Cook
32	Old Carver Bait and Tackle	(952) 426-1599	Carver
33	Prior Lake Bait & Tackle	(952) 447-6096	Prior Lake
34	Rocky's Bait	(218) 842-5233	Erhard
35	Tutt's Bait & Tackle	(320) 692-4341	Garrison
36	Vados Bait & Tackle	(763) 784-6728	Spring Lake Park
37	Walts (Bait and Tackle)	(507) 625-4872	North Mankato
38	Witt's Quality Bait & Tackle	(218) 234-3377	Detroit Lakes
39	507 Master Bait & Tackle	(507) 893-3822	Winnebago
Plant Nurseries/Water Gardens			
40	Aqua Eden	(507) 333-5959	Faribault
41	Aquatic Gardens & Landscaping, Inc.	(507) 380-1264	Mankato
42	EcoGarden Supply	(651) 647-1896	St. Paul
43	Gertens	(651) 450-1501	Inver Grove Heights
44	Minnesota Waterscapes	(763) 458-8104	Corcoran
45	Mother Earth Gardens	(612) 789-0796	Minneapolis
46	Queen Bee'z Lawn & Garden	(952) 440-8165	Prior Lake
47	SiteOne Hardscape Center	(651) 748-3158	Stillwater
48	Superior Outdoor Expressions	(952) 446-8000	St. Bonifacius
49	The Pond Company	(952) 378-1079	Bloomington
50	The Watering Can Garden Shop	(218) 666-5398	Cook

Table 5. Retailers in NY

	Retailer	Phone Number	City
Aquarium Retailers			
1	Aqua Star Pet	(212) 431-4311	New York
2	Aquatic Creations: Aquarium & Fish Tanks	(347) 674-8845	Brooklyn
3	Beital's Aquarium Sales, Services & Ponds	(845) 735-2300	Pearl River
4	Complete Aquarium	(914) 244-9174	Bedford Hills
5	Exotic Reef Aquatic Inc.	(718) 759-6877	Brooklyn
6	Father Natures Aquarium Services	(347) 517-8690	Brooklyn
7	Monster Aquarium Inc.	(347) 732-0373	Queens
8	New York Reef Aquatic	(718) 888-0902	Queens
9	Pacific Aquarium & Plant	(212) 995-5895	New York
10	Paradise Aquarium	(718) 366-6921	Queens
11	The iFISH Store	(833) 428-0747	Richmond Hill
12	The Reef Shoppe	(347) 851-4600	Bronx
13	Total Aquariums	(516) 887-5048	Lynbrook
14	1st Class Aquarium	(718) 876-8826	Staten Island
Bait Shops			
15	Bernie's Bait & Tackle	(718) 646-7600	Brooklyn
16	Big Ron's Fishing Station	(718) 843-3800	Queens

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17	Coney Island Hook & Bait Shop	(347) 312-3868	Brooklyn
18	Daniel's Bait & Tackle Shop	(718) 651-5603	Queens
19	Fisherman Depot	(718) 886-2008	Queens
20	Jack's Bait & Tackle	(718) 885-2042	Bronx
21	Kaseys Cast-A-Ways Bait and Tackle Shop and Fun Farm	(845) 858-2001	Port Jervis
22	Mohegan Sportsman	(914) 528-2429	Mohegan Lake
23	O & H Bait Shop	(845) 469-2566	Chester
24	Stella Maris Bait & Tackle	(718) 646-9754	Brooklyn
25	Tom's Bait & Tackle	(718) 474-8232	Queens
26	Urban Angler	(212) 689-6400	New York
27	Vinnys Lakehouse	(845) 297-3184	Wappingers Falls
Plant Nurseries/Water Gardens			
28	Bergen Water Gardens & Nursery	(585) 293-2860	Churchville
29	Cheap Sam's Plant Bargains	(631) 654-3020	Holtsville
30	Clearly Aquatics Inc.	(585) 657-7679	Bloomfield
31	Coldwater Pond Nursery	(315) 331-8068	Phelps
32	Fish Haven Farm	(607) 659-3474	Candor
33	Garden State Koi Pond & Waterfall Design Center	(845) 651-4100	Warwick
34	Garden World	(718) 224-6789	Queens
35	Hahn's Ponds	(716) 731-5513	Sanborn
36	Hick Nurseries, Inc.	(516) 334-0066	Westbury
37	Hickory Hollow Nursery and Garden Center	(845) 351-7226	Tuxedo
38	Koi Market Aquatic Nursery & Bonsai	(516) 809-6771	Dix Hills
39	Larchmont Nurseries	(914) 834-5802	Larchmont
40	Little York Plantation	(607) 749-4861	Little York
41	Natty Garden	(718) 483-8833	Brooklyn
42	Putnam Lake Garden Center	(845) 278-5258	Patterson
43	Starkie Bros Garden Center	(516) 293-7148	Farmingdale
44	S. Scherer and Sons, Inc.	(631) 261-7432	Northport
45	Twin Pond Greenhouses	(845) 457-1991	Montgomery
46	Twin Ponds on the Farm	(845) 457-1830	Montgomery
47	Urban Garden Center	(646) 389-4299	New York

Table 6. Retailers in OH

	Retailer	Phone Number	City
Aquarium Retailers			
1	ABC Aquatics Aquarium Specialists	(216) 215-5139	Cleveland
2	Aquarium Adventure Columbus	(614) 792-0884	Hilliard
3	Aquarium Artisans	(513) 895-3474	Springdale
4	Aquarium Maintenance & Sales	(513) 863-5473	Williamsburg
5	Aquarium World LLC	(567) 408-7258	Sylvania
6	Aquatic Galore LLC	(937) 422-0478	Fairborn
7	Aquatic Technology	(440) 236-8330	Columbia Station
8	Aquatica Aquarium Gallery	(330) 866-0559	Valley City
9	Aquatics and Exotics	(513) 521-5500	Cincinnati
10	Best in Pets	(440) 366-5445	Elyria
11	Blue Fish Aquariums	(440) 720-0776	Cleveland
12	Blue Hook Aquatics	(513) 443-4741	Cincinnati

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13	Dr. Jack's Aquatics and Exotics	(937) 912-9004	Beavercreek
14	Gerber's Tropical Fish	(937) 297-0515	Dayton
15	Great Lakes Fish and Coral	(330) 748-2000	Macedonia
16	Jurassic Aquatics & Pets	(440) 461-7387	Willoughby
17	Ocean Rift Aquatics	(330) 244-9785	North Canton
18	Rainy Day Fish LLC	(216) 331-4099	Cleveland
19	Rift Lakes Aquatics	(216) 215-1639	Cleveland
20	Rivers to Reefs Aquariums	(614) 934-5155	Gahanna
21	Rj's Aquarium	(740) 928-2913	Hebron
Bait Shops			
22	Bait OutBack	(419) 296-5257	Lima
23	Cedar Lake	(513) 575-0124	Loveland
24	East Side Bait & Tackle	(419) 733-8746	St. Marys
25	Epic Baits	(937) 479-6429	Carlisle
26	Fishing Pole Bait Shop	(937) 289-8027	Clarksville
27	Freedom Bait-N-More	(419) 670-2504	Cloverdale
28	Gene's Marine Bait & Tackle	(937) 843-2551	Russells Point
29	Go Wild Go Fish	(513) 422-2429	Middletown
30	Hamilton Bait & Tackle	(513) 869-2248	Fairfield
31	Indian Lake Wholesale Bait LLC	(937) 638-8783	Botkins
32	Lakeside Pro Bass Shop	(937) 843-2488	Lakeview
33	Mike's Bait & Tackle	(937) 843-2261	Lakeview
34	Milans Bait & Archery	(419) 221-0672	Lima
35	Oxbow Bait & Archery Supplies	(419) 658-4000	Defiance
36	Paul's Supply	(419) 782-7400	Defiance
37	Rod-Dee's Carryout	(937) 384-9150	Miamisburg
38	Spillway Bait & Tackle	(419) 628-3981	Minster
39	Spillway Party Supply	(513) 897-9334	Waynesville
40	Spring Water Paylake & Bait Shop	(937) 962-1030	Lewisburg
41	Wholesale Bait Co Inc	(513) 863-2380	Fairfield
42	Windy Point Bait & Tackle	(419) 919-0014	Celina
43	68 Bait & Tackle	(937) 444-0505	Bethel
Plant Nurseries/Water Gardens			
44	Aquatic & Garden Décor	(513) 777-1744	Cincinnati
45	Berns Garden Center	(513) 423-5306	Middletown
46	Berns Garden Center & Landscaping	(937) 912-0422	Beavercreek
47	Midwest Water Gardens LLC	(614) 870-8927	Delaware
48	North Dayton Garden Center & Nursery	(937) 233-5761	Middletown
49	Northgate Greenhouses	(513) 729-1134	Cincinnati
50	Oak Park Garden Center	(419) 825-1438	Swanton
51	Pond and Garden Depot	(866) 305-5459	Kettering
52	Reading Feed & Garden	(513) 554-4769	Cincinnati
53	Starry Water Gardens	(513) 720-0168	Wilmington
54	Uncle Bill's Garden Center	(513) 522-4438	Cincinnati
55	Water-Smith Systems	(800) 634-7434	Urbana
Distributors			
56	Remlinger Fish Farm	(419) 532-2335	Kalida

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Table 7. Retailers in PA

	Retailer	Phone Number	City
Aquarium Retailers			
1	Aquarium Management Systems	(570) 275-6160	Danville
2	Aquarium World	(610) 485-3189	Upper Chichester Twp
3	Aquarium Xpress	(717) 919-2221	Harrisburg
4	Aquatic Gardens	(724) 843-5250	Beaver Falls
5	Buzz n B's Aquarium & Pet Shop	(814) 616-0065	Erie
6	Coral Reef Connection	(484) 709-6621	West Reading
7	Coveys Coral Cove	(570) 854-7321	Bloomsburg
8	Cuboid Nature Aquarium	(215) 794-3474	Pipersville
9	Elmer's Aquarium & Pet Center	(412) 372-6535	Monroeville
10	Finatics Aquarium & Pet Center	(814) 862-9357	State College
11	Fish Factory	(215) 785-0761	Bristol
12	Fish Geeks	(717) 599-2122	Mechanicsburg
13	One Fish Two Fish	(570) 992-1230	Brodheadsville
14	Seven Seas Aquarium	(610) 876-1117	Brookhaven
15	Something Fishy: Saltwater Aquarium Superstore	(610) 502-9760	Northampton
16	The Hidden Reef, Inc.	(215) 269-4930	Liebertown
17	The Reef Gallery	(724) 453-4099	Zelienople
18	The Water Edge Aquarium	(484) 809-3666	Wind Gap
19	Van Gogh Aquariums	(610) 500-1789	Glen Mills
20	World Wide Aquarium & Pets	(215) 490-9766	Philadelphia
Bait Shops			
21	Bill's Bait and Tackle	(814) 927-7393	Marienville
22	Coble's Bait Shop	(717) 272-1171	Lebanon
23	Columbia Bait and Tackle	(717) 330-7908	Columbia
24	Dean's Line N' Bait Shop	(724) 762-8338	Indiana
25	FC's Bait-Tackle and Reptiles	(724) 601-0067	New Brighton
26	Fishermen's Haven Bait & Tackle Shop	(814) 909-9016	Springfield
27	Gillette's Bait & Tackle	(814) 683-1026	Linesville
28	Harrys Lakeside Bait Shop	(724) 962-1504	Sharpsville
29	HawgHead Marine and Tackle	(717) 432-4505	Wellsville
30	Jimmy's Bait Shop	(724) 837-6475	Greensburg
31	Jim's Mino & Bait	(814) 353-4069	Howard
32	Poor Richard's Bait & Tackle	(814) 474-5623	Fairview
33	Reddi Bait	(724) 888-2932	Beaver
34	Red's Bait Shop	(724) 423-4902	Acme
35	Robinson's Wholesale Bait	(814) 818-0248	Linesville
36	Sportmaster Bait and Tackle	(215) 331-8836	Philadelphia
37	S&R Bait Shop	(570) 385-1916	Schuylkill Haven

Table 8. Retailers in WI

	Retailer	Phone Number	City
Aquarium Retailers			
1	America Aquaria	(262) 781-6060	Brookfield
2	Aquarium Pet Shop & Grooming	(715) 421-0776	Wisconsin Rapids
3	Aquarium Supplies and Maintenance	(715) 863-1031	Plover
4	Aquascapes by The Fisherman	(715) 966-6353	

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5	Aquatic Realmz Aquarium Maintenance & Design	(414) 800-5825	Greenfield
6	Aquatics Unlimited	(414) 543-2552	Greenfield
7	Best Fish	(414) 224-0486	Milwaukee
8	Bry the Fish Guy Aquarium	(651) 442-6162	Twin Cities
9	Easy Aqua Fish & Coral	(262) 612-0395	Waukesha
10	Elsner Aquarium Supply	(920) 893-5774	Plymouth
11	LiveAquaria	(800) 334-3699	Rhineland
12	Marineland Pet Center	(608) 783-3186	Onalaska
13	Milwaukee Aquatics	(414) 719-5025	Milwaukee
14	Schwaquatics	(763) 412-7045	
15	The Fish Factory	(414) 546-2201	Milwaukee
16	Tropic Waters Pet Center	(715) 832-0174	Eau Claire
17	Vang Aquatic Life LLC	(262) 202-8114	Butler
Bait Shops			
18	A & C Live Bait Inc.	(414) 372-1020	Milwaukee
19	B&H Trout Fishing & Bait Shop	(608) 254-7280	Wisconsin Dells
20	Dave's Bait & Tackle	(608) 312-4400	Beloit
21	Dead End Bar & Bait	(608) 423-2117	Cambridge
22	Dick Smith's Live Bait & Tackle	(262) 646-2218	Delafield
23	D&S Bait, Tackle & Fly Shop	(608) 241-4225	Madison
24	Emma's Bait Shop	(608) 781-4926	Onalaska
25	Fat Cat Bait & Fishing Supply	(608) 534-5359	Trempealeau
26	Fox River Bait & Tackle	(920) 233-7409	Oshkosh
27	Fremont Bait & Tackle	(920) 505-0145	Fremont
28	Geneva Lake Bait & Tackle	(262) 245-6150	Williams Bay
29	It's A Keeper Bait & Tackle	(608) 757-2061	Janesville
30	J&T Bait Shanty	(608) 423-2117	Cambridge
31	Long Lake Bait & Tackle	(715) 635-3260	Sarona
32	Lured Inn Outdoors Tackle & Bait	(608) 718-2364	Janesville
33	Minnesota Leeches	(414) 744-2077	Milwaukee
34	Musky Mike's Bait & Tackle, LLC	(262) 560-1189	Okauchee Lake
35	Old Powerhouse Bait Shop	(608) 558-9511	Brodhead
36	River Haus Bait Tackle & Gifts	(920) 322-9412	Fond du Lac
37	Sandy's Port of Call	(414) 762-1960	Oak Creek
38	Smokey's Musky Shop	(262) 691-9659	Pewaukee
39	The Original Live Bait Shop	(920) 295-6459	Princeton
40	Trapper's Bait Shop	(920) 478-3630	Waterloo

Table 9. Online suppliers

	Online Supplier	Website
1	Live Crawfish for Sale	https://www.livecrawfishforsale.com
2	Lousiana Crawfish Company	https://www.lacrawfish.com
3	Cajuncrawfish.com	http://www.cajuncrawfish.com
4	Kyle LeBlanc Crawfish Farms	http://www.klcrawfishfarms.com
5	Critter Runners	https://crawfish.com
6	Crayfishman	http://www.crayfishman.com

Appendix II – Crayfish Retailer Survey Questionnaire

All survey questions were optional. Prompts were provided for most questions but were used only when additional details or clarification was requested from the respondent.

Crayfish Retailer Survey

Consent Statement

As part of the interview, I am required by the university to say the consent statement and to let you know what you are agreeing to before the survey.

I am a researcher with the University of Illinois, and we are looking to learn about the supply chain of live crayfish in the Great Lakes region. I'm hoping to speak to a manager or somebody that can answer these questions.

Would you be willing to help us in our research by answering a few questions? We are conducting voluntary phone interviews in which I will ask a series of questions related to the procurement and sale of live crayfish, as well as opinions around invasive species regulations and environmental concerns. This interview will help us understand sources of novel crayfish in the Great Lakes, some of which can become invasive if mishandled.

We are not an enforcement agency. We are only looking to understand how invasive crayfish regulations impact your business. This will help us understand any burdens placed on you by these regulations so we can develop invasive species prevention resources that will be the most useful for businesses like yours. None of your answers will be reported to anyone outside of our working group at the University. The data collected today will be used as part of a final report without any information linking them to your business.

The interview will take about 20 minutes to complete, your name will be kept private and none of the questions will be of a sensitive nature. If you choose to participate, you are free to skip any question I ask, and we can end the interview at any time. I will provide contact information for my team and to the Office for the Protection of Research Subjects at the University in case you have any questions about this research after today. Is it okay if we continue?

Background information recorded

Business: Name, Address, Phone Number, Email

Interviewer: Name, Date and Time of Interview

Interview Questions

Screening and contact

1. Does your business sell live crayfish? If not, where would you refer me to find crayfish?
 2. Are you the best contact for this business? If not, who would be?
 3. What is the best way to get a hold of you/them in the future? Name, email, phone, times, days of the week, preferred method of contact.
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CRAYFISH RETAILER SURVEY REPORT

Business practice and supply chain

First, we have some questions to better understand the sale of crayfish. The purpose of these questions is to help us provide better educational materials to businesses like yours and your consumers.

4. For what purposes or uses does your business sell crayfish? Or, who are your main consumers of crayfish? (Prompt: Does your business sell crayfish as bait, trade, biological control for gardens, food, or educators? Type of consumers like anglers or pet owners?)
5. How does your business sell crayfish? (Prompt: Do you sell crayfish from a store front to consumers, wholesale to retailers, online, in person, etc.?)
6. Do you sell outside of your state? (Skip if NO) Which state? (Prompt: Could you specify the states where you sell the crayfish.)
7. What type of crayfish do you sell?
 - i. Do you know the species names/common English names? (Prompt: Do you sell them with the name that you were given or sell them with the scientific name such as for an electric blue crayfish as *Procambarus alleni*?)
 - ii. Scientific names? (Prompt: For example, an electric blue crayfish is sometimes sold as *Procambarus alleni*?)
10. Do you sell crayfish seasonally (sometimes) or year-round (always)?
11. How do you obtain the crayfish that you sell? (Prompt: wholesale, breeders, farm it, wild catch, etc.)

To help us to be able to more effectively provide outreach along the supply chain at strategic points, we are asking people from which businesses or individuals you obtain your crayfish. Due to the sensitive nature of this question, we again note that any data collected today will not be shared outside of our working group. This data will however be used to create a list of suppliers of crayfish for outreach purposes along with an estimate of the number of businesses that use them as their source of crayfish.

12. Could you provide us with contact information for your supplier or possibly help us contact them? We will reach out and provide them with the same opportunity to answer these questions.
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Invasive species, regulations and the environment

We are now wanting to shift into some opinion-based questions regarding invasive species, the environment, and regulations.

13. What do you feel are people's role in the natural world/the environment?
 14. What are your thoughts on the issue of invasive species? Interviewer note: should note if you have to define invasive species at this point or previously.
 15. Do you feel like invasive species are a risk to the Great Lakes economies or ecosystems? Why or why not?
 16. What are your thoughts on the roles and responsibilities of businesses along the supply chain as they relate to invasive crayfish? (Prompt: Who do you feel is the most responsible for preventing the introduction of invasive crayfish?)
 17. What are your thoughts on invasive species regulations? (Prompt: Are they effective? Are you familiar with them? In your opinion, do they help/hurt businesses?)
 18. How and where do you get information about invasive species?
 19. What could we (or others) do better to provide you with invasive species regulation information? (Prompt: what materials would be helpful?)
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CRAYFISH RETAILER SURVEY REPORT

Outreach

Again, our goal is to create outreach opportunities that provide businesses and consumers with information regarding crayfish and other aquatic organisms in trade.

20. Would you participate in outreach programs that would provide your consumers with information about invasive species? Any reason why or why not? (Prompt: Provide brochures, posters, training, etc.)
 21. Do you see other opportunities for your business to participate in invasive species education efforts?
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Demographics

Finally, if you are willing to, we would like to collect some demographic information about our interviewees to help us better understand our audiences so as to provide them with the best-possible educational efforts.

22. What is your gender? Male, Female, Other, Prefer not to respond
 23. In what year were you born?
 24. With which racial groups do you identify? White, Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, Other
 25. With which ethnicity do you identify? Hispanic or Non-Hispanic
 26. What is the highest level of education you have completed? (Possible prompts - Less than high school, High school graduate or GED, Some college, Two-year degree, Bachelor's degree, Professional degree, Doctorate)
 27. What is your annual household income before taxes?
-

Others

28. Do you have any final thoughts on any of the topics we discussed today?
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End Note

Thank you very much for your time! Please feel to reach out to the research team if you have any questions about today's interview.