Anglers' Use of Live Bait Fish, Soft Plastic Lures, and Fish Attractants: Results from a 2026 Recreational Fishing Survey

By: Kory Whittum, Fisheries Planner and Research Coordinator

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Maine Department of
Inland Fisheries & Wildlife
Fisheries and Hatcheries Division

Introduction

Within the Maine Fisheries and Hatcheries Strategic Management Plan 2021-2035, the Fisheries Division identifies a variety of goals and strategies to manage Maine's freshwater fisheries into the future. A small portion of these goals and strategies focus on the management of bait fish, which are species of fish used to catch larger predatory sport fish. In Maine, bait fish are composed of species legally defined as "*baitfish*" within Maine statute (12 M.R.S. § 10001(6)) or "*Rainbow Smelt*". For the purposes of this report, all legal species used as live bait fish are referred to in general as "bait fish" to be inclusive of legally defined "*baitfish*" as well as "*rainbow smelt*".

The Maine Department of Inland Fisheries and Wildlife, hereafter "Department" or MDIFW, manages bait fish primarily through the issuance of commercial harvest and retail licenses in conjunction with regulating the waters in which commercial harvest is permitted. As part of management efforts, commercial harvesters are required to submit annual reports documenting harvest locations, species harvested, and quantity harvested. Department staff also maintain records of bait availability and pricing by conducting annual visits to retail locations. In addition to the commercial harvest of bait fish on the landscape, recreational anglers are afforded the opportunity to harvest their own bait fish under their freshwater fishing license.

It's important to note that the importation of live bait fish is prohibited under Maine law therefore all live bait fish are required to be sourced within Maine, harvested either commercially or recreationally. While the Department has a strong understanding of commercial bait fish harvest and sale, direct information on recreational bait fish use and harvest is limited.

To address this information need, the Department developed an online survey to better understand recreational anglers' use and harvest of live bait fish in Maine. The survey also included questions regarding anglers' use of soft plastic lures and fish attractants to provide additional information relevant to fisheries management. An email containing a link to the survey was distributed to licensed anglers through MDIFW's Information and Education Division email listserv.

Methods

The survey included questions that anonymously assessed anglers' use of live bait fish, including the seasons in which they use live bait fish and the fish species they target when using live bait fish (Appendix A). Respondents were also asked whether they were aware that their freshwater fishing license allows them to harvest their own bait fish and, if so, whether they participate in the activity. Anglers who reported harvesting their own live bait fish were asked which species they typically harvest, the approximate quantity harvested, and their motivations for harvesting their own live bait fish.

In addition to questions about live bait fish use and harvest, the survey included a series of questions examining anglers' use of soft plastic lures and fish attractants, such as scented putties, oils, and other scent-based products. Follow-up questions asked which fish species anglers targeted when using these products and during which seasons they typically used them.

The survey was distributed on May 8, 2026, through MDIFW's Information and Education Division's email listserv to 405,415 email addresses associated with current and former licensed anglers. To increase the overall response rate while minimizing the likelihood of duplicate responses, the survey invitation was resent twice to a subset of the original mailing list consisting only of recipients who had not opened the previous emails.

Results

The survey received 4,028 responses, a response rate of 1% of the 405,415 email addresses this survey was sent to. The number of Maine freshwater fishing survey respondents by reported age groups was largely representative of respondents with those 45 and older collectively representing 84% (65+ = 51%, 55-64 = 23%, and 45-54 = 10%) of the total sample of respondents (Figure 1).

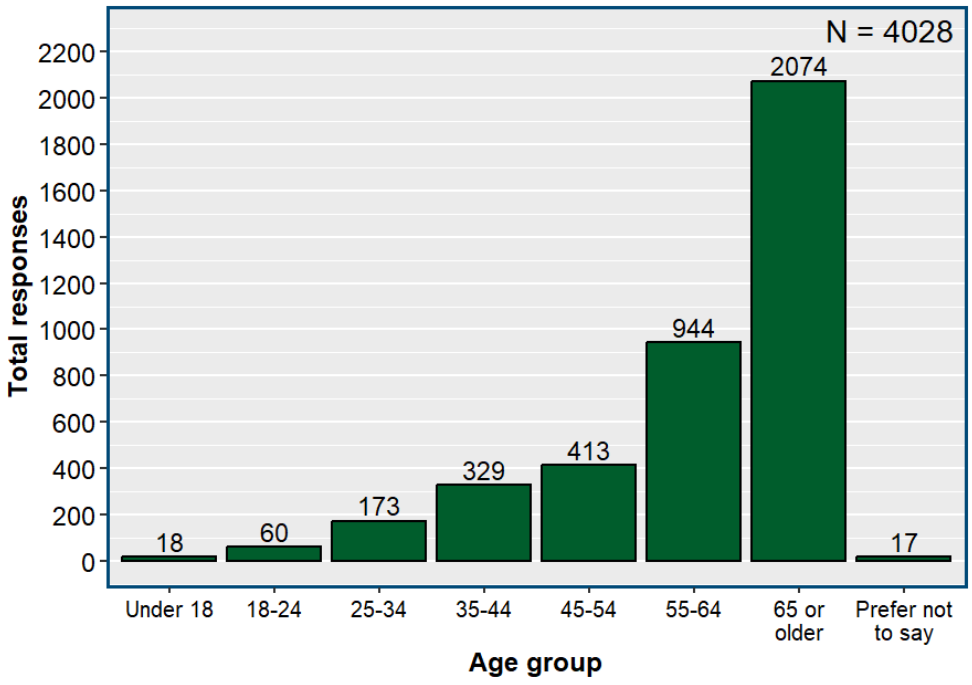


Figure 1. Number of Maine freshwater fishing survey respondents by reported age group.

Reported use of live bait fish, soft plastic lures, and scented fish attractants

Of the 4,028 responses we received for this survey, 2,217 (55%) respondents indicated that they used live bait fish when angling in freshwater in Maine within the last five years (Table 1.) Results for those that indicated using live bait fish were then broken down by age group to determine potential differences among age groups in the use of live bait fish. The percentage of those that used live bait fish varied from 32% (18-24) up to 63% (65 or older) with a general decreasing trend in the use of live bait fish among older age groups (Figure 2). This trend should be interpreted with caution due to small sample sizes, particularly in younger age groups (Figure 1).

Table 1. Total and percentage of reported use of live bait fish, soft plastic lures, and scented fish attractants within inland waters in the last five years.

Method of fishing	Yes	No
Use of live bait fish	1811 (44.9%)	2217 (55.1%)
Use of soft plastic lures	2278 (56.6%)	1750 (43.4%)
Use of scented puddy, oil, or other fish attractants	470 (11.7%)	3558 (88.3%)

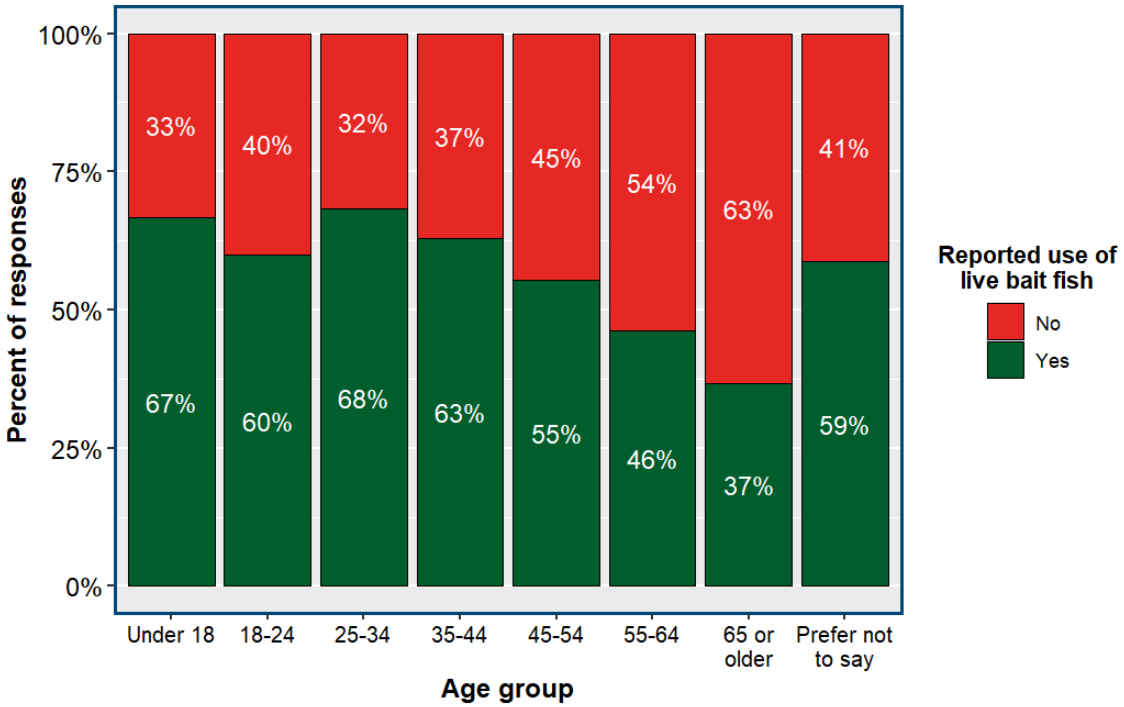


Figure 2. Percentage of reported use of live bait fish within inland waters in the last five years by age group.

Respondents that indicated using live bait fish were then asked which species they used, allowing for multiple options to be selected. Respondents also had the option to select "Other" which prompted them to write in their response in the event the live bait fish they used were not captured in the provided options. Golden Shiner and Common Shiner were among the most commonly used live bait fish representing 43% of responses, followed by Rainbow Smelt (26%), minnows, which includes Fathead Minnow and Eastern Silvery Minnow (13%), suckers which includes White Sucker and Longnose Sucker (10%), and Northern Redbelly Dace and Blacknose Dace (7%). Less than 1% of respondents that reported using live bait fish reported using Mummichog or Banded Killifish (Figure 3). A total of 56 responses (<1%) indicated they were unsure of what live bait fish they use. A total of 107 write-in responses were received spanning a diversity of responses with most not germane to the survey question. Responses that were germane to the survey question included American Eel (n=2), Creek Chub (n=1), and Lake Chub (n=1).

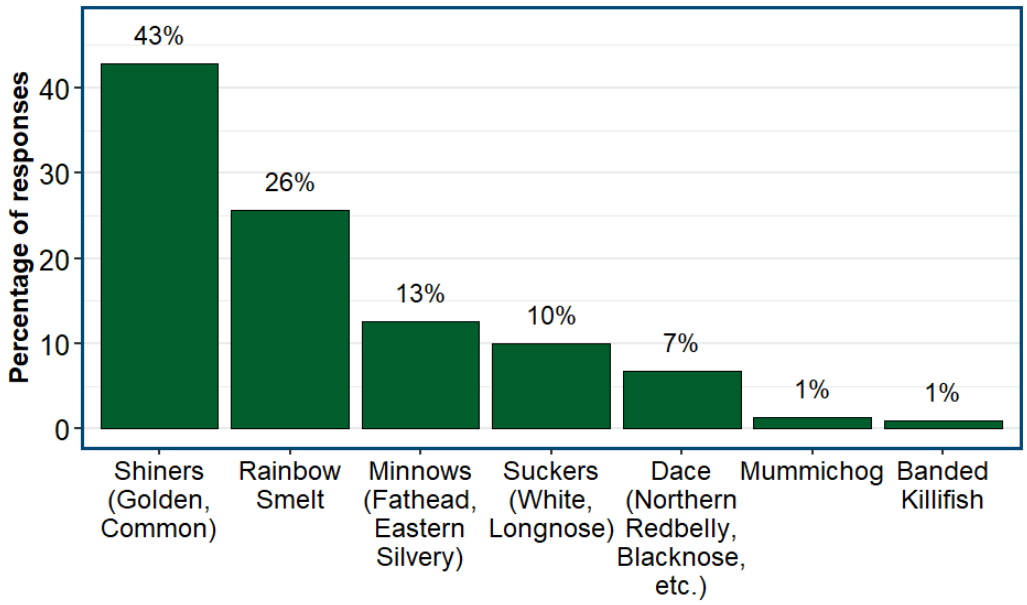


Figure 3. Reported use of live bait fish types used in the last 5 years when angling Maine inland waters within the last 5 years displayed as percentages.

Respondents were then asked which freshwater fish species they typically target when using live bait fish with various options available to select along with a write-in option. Of the target species reported by respondents, Landlocked Salmon and Brook Trout were among the most popular freshwater fish species to target when using live bait fish each at 17% (Figure 4). Write-in responses represented less than 1% of the total responses, with most of the write-in options consisting of "Anything that will bite". Additional write-in responses germane to the question included Lake Whitefish (n=3, < 1%), and Brown Bullhead (n=2, < 1%). A follow up question was then provided to respondents asking during which seasons (Spring, Summer, Fall, Winter) they

typically use live bait fish. The winter season was the most common response reported at 53.6%, followed by spring (20.9%), summer (18.6%), and fall (6.9%) (Table 2).

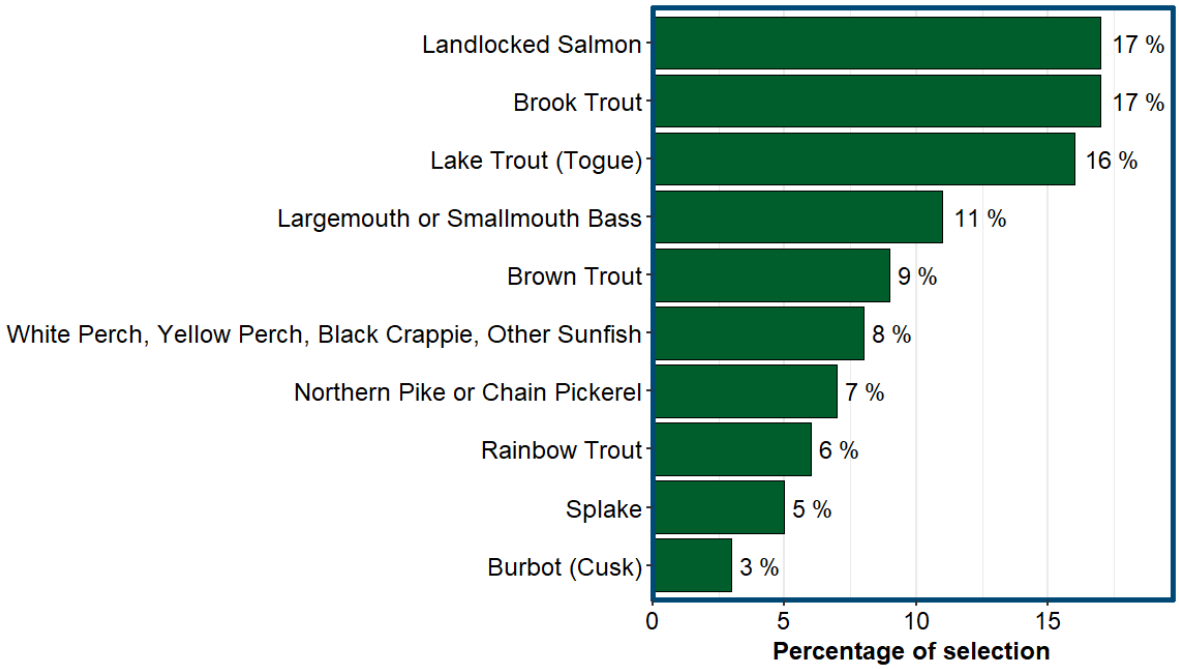


Figure 4. Reported species targeted in the last five years within inland waters when using live bait fish as a percentage of total live bait fish users.

Table 2. Total and percentage of reported use in the last five years by season of live bait fish and soft plastic lures within inland waters.

	Season			
Method of fishing	Spring	Summer	Fall	Winter
Use of live bait fish	378 (20.9%)	337 (18.6%)	125 (6.9%)	971 (53.6%)
Use of soft plastic lures	660 (29.0%)	1,030 (45.2%)	499 (21.9%)	89 (3.9%)

In addition to the use of live bait fish, the use of soft plastic lures was also assessed among respondents. Soft plastic lure use was reported by 56.6% of respondents when fishing in Maine during the past five years, 11.7% greater than the use of live bait fish (Table 1). The proportion of those reporting using soft plastics varied among age groups (49%-89%) with older respondents reporting lower use of soft plastic lures (Figure 5). This result should be treated with caution given the small sample size for younger age groups (Figure 1). The most frequently reported fish species targeted while using soft plastic lures were Largemouth and Smallmouth Bass at 42% (Figure 6). In general, warm water fish species (ex. bass, perch, crappie, sunfish,

pickerel) ranked highest when using soft plastic lures, whereas cold water fish (salmon, trout, and Burbot) ranked lowest as target species when using soft plastic lures. Soft plastic lure use was reported highest during the summer months (45.2%) followed by spring (29.0%) and fall (21.9%), with winter having the lowest reported use at 3.9%.

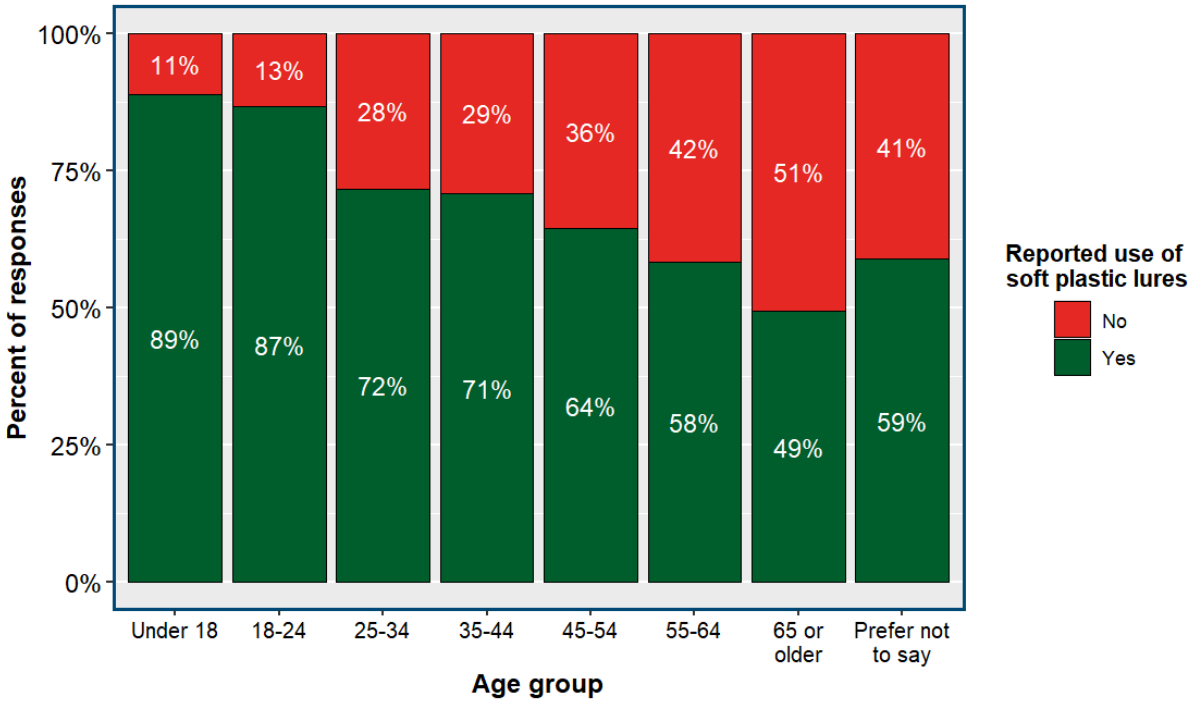


Figure 5. Percentage of reported soft plastic lure use within inland waters in the last five years by age group.

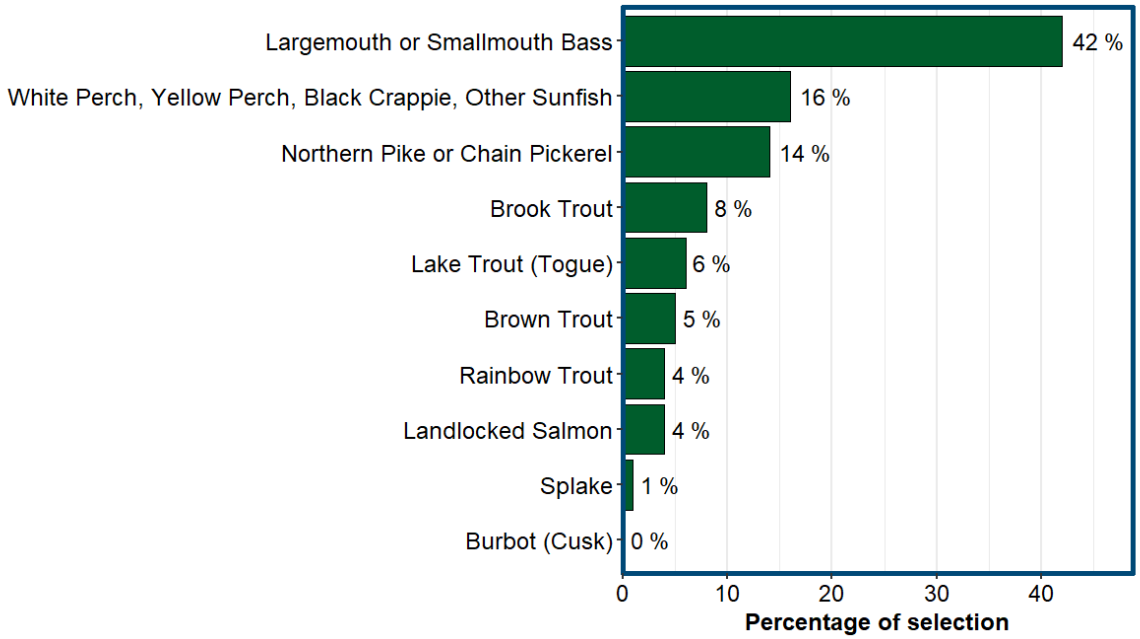


Figure 6. Reported species targeted in the last five years within inland waters when using soft plastic lures displayed as a percentage of total soft plastic users.

The use of scented putty, oils, or other fish attractants had the lowest proportion of reported use among the three fishing methods assessed, with only 11.7% of respondents reporting their use within the last five years of fishing (Table 2). Among respondents who reported using scented attractants, Largemouth and Smallmouth Bass were the most frequently reported target species, accounting for 26% of responses (Figure 7). Several salmonid species, including Brook Trout, Lake Trout, and Landlocked Salmon ranked higher among target species than other warmwater fishes such as perch, sunfish, crappie, pickerel, and pike. In contrast, species targeted with soft plastic lures consisted predominantly of warm water species.

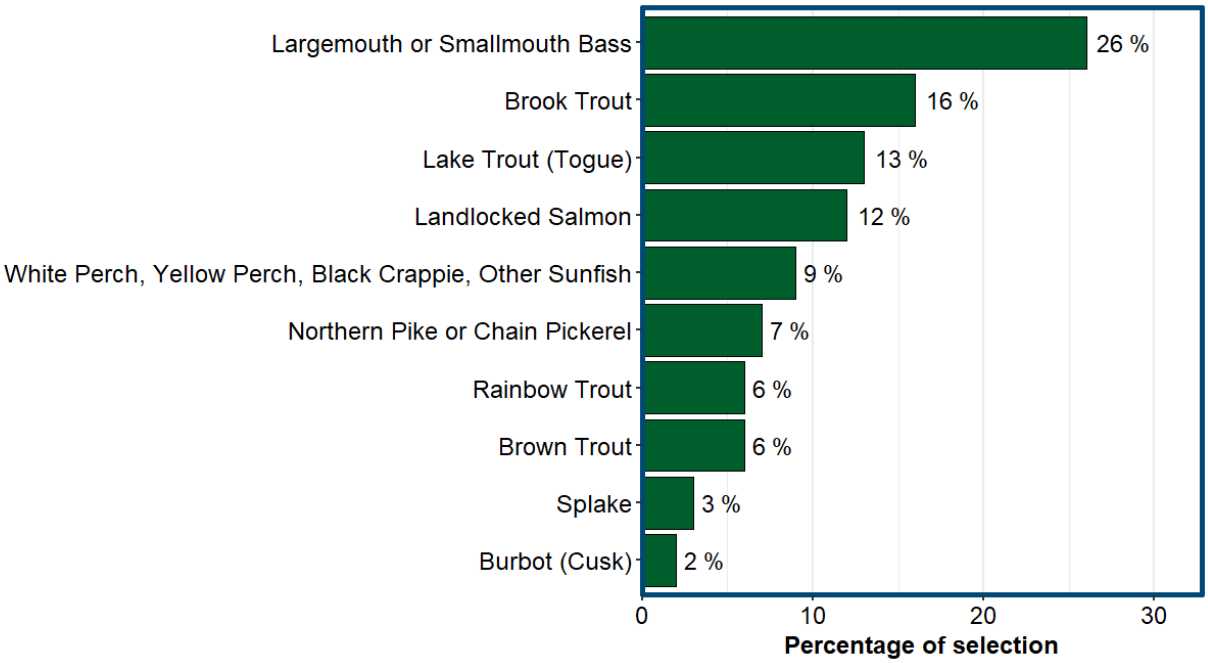


Figure 7. Reported species targeted in the last five years when using scented putty, oils, or other fish attractants within inland waters displayed as a percentage of total scented attractant users.

Reported recreational bait fish harvest

Of the 4,028 responses we received for the survey, 2,348 (58%) were aware that their freshwater fishing license affords them the opportunity to recreationally harvest their own live bait fish. Of the 2,217 respondents that reported using live bait fish in the last 5 years, nearly 25% (n=592) reported harvesting their own live bait fish, representing 15% of all survey respondents. Among respondents that reported harvesting their own bait fish, Common and Golden Shiner were the most common (44%) species of bait fish harvested by recreational anglers followed by minnows (19%), dace (14%), and Rainbow Smelt (12%) (Figure 8). Survey results indicated that 42% of recreational anglers harvesting their own live bait fish reported harvesting 50-200 individual fish within a given year, and 43% reported harvesting less than 50

individual fish within a given year. The remaining 15% of recreational anglers that harvest their own live bait fish reported harvesting 200 or more individual fish in a given year.

Motivations among respondents for recreationally harvesting live bait fish included “To save money” (32%), “for enjoyment” (29%), “more accessible than a bait shop” (26%), and “to target a particular species or size of bait” (10%). The remaining 3% of responses represents write-in responses. Similar to previous questions within the survey, not all write-in responses were germane to the survey question. Of the relevant responses received, several respondents noted that harvesting bait fish is a tradition they enjoy sharing with their children. Others indicated that bait shops may be closed or inaccessible during the open-water season, that they prefer to use fish naturally occurring in the waterbody they are fishing, or that they trap bait fish for educational purposes and to share the experience with friends and family.

Respondents who were not aware they could harvest their own bait, or did not report harvesting their own bait, were then asked if they would be interested in learning how to harvest their own bait. Of all survey respondents, 30% (n=1191) reported they would be interested in learning how to harvest their own bait fish.

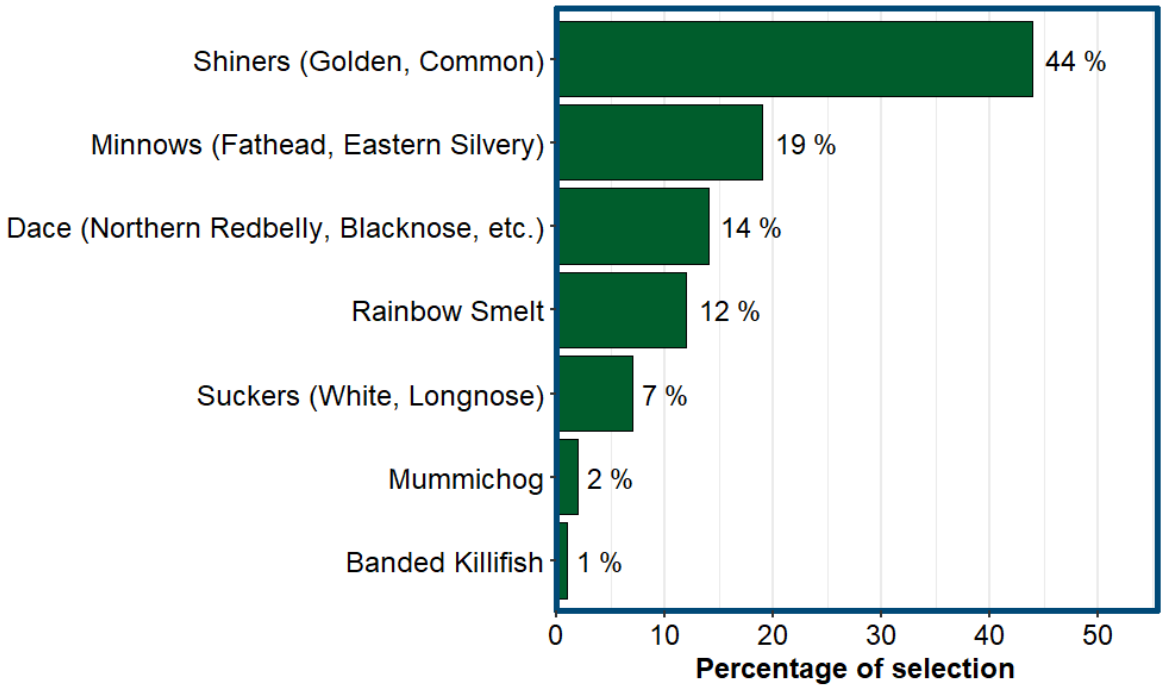


Figure 8. Live bait fish species groups that were harvested by recreational anglers as a percent of total selections.

Discussion

Although survey respondents represented approximately 1% of licensed freshwater anglers in Maine, the results provide valuable baseline information on recreational live bait fish use and associated angling practices. Nearly half of the respondents reported using live bait fish within the last five years, indicating that the use of live bait fish remains an important component of recreational freshwater fishing in Maine. Given the prevalence of live bait fish use, continued educational efforts remain a priority for the Department to ensure anglers can accurately identify legal bait fish species and understand the regulations governing their possession and use.

Approximately 3% (52 of 2,217) of respondents who reported using live bait fish indicated they were uncertain of the species they had used. While some uncertainty may reflect the retrospective nature of the survey and respondents' inability to recall bait fish used several years earlier, it may also likely indicate that a subset of anglers cannot confidently identify the bait fish species they use. Although many anglers likely rely on licensed bait dealers to provide legal bait fish species, anglers are ultimately responsible for ensuring that the species they possess and use are legally permitted. While MDIFW biological and enforcement staff visit a portion of licensed bait dealers each year to help ensure that only legal bait fish species are offered for sale, the Department does not have the ability to visit every bait shop annually. Although encounters with illegal bait species during such visits are uncommon, they do occur periodically. Within the survey, several respondents reported using illegal forms of bait, including sunfish, crayfish, and tadpoles. While responses indicating the use of illegal forms of live bait were rare, their occurrence still demonstrates the need for continued education, outreach, and enforcement to ensure anglers are using legally permitted bait.

In addition to species identification, anglers must also understand where live bait fish may be legally used, as regulations vary considerably among waters. While this survey did not examine respondents' understanding of fishing laws pertaining to the use of live bait fish, we highlight relevant current freshwater fishing regulations here for further context. Under Maine's general fishing laws, the use of live bait fish is permitted throughout much of the South Zone (Figure 9). Many waters within this portion of the state support stocked salmonid fisheries and/or established native and nonnative warmwater fisheries, with many of the legal bait fish species being already present within these watersheds. Consequently, the ecological risks associated with the unintended introduction of additional legal bait fish species may be comparatively lower in these systems than in waters where such species are absent. However, certain waters within the South Zone receive additional protection through the use of water-specific special regulations, which prohibit the use of live bait fish to protect sensitive fisheries resources, such as wild salmonid populations. These waters are often regulated with a "S-4"; use or possession of live fish as bait prohibited or Artificial Lures Only ("ALO") regulation.

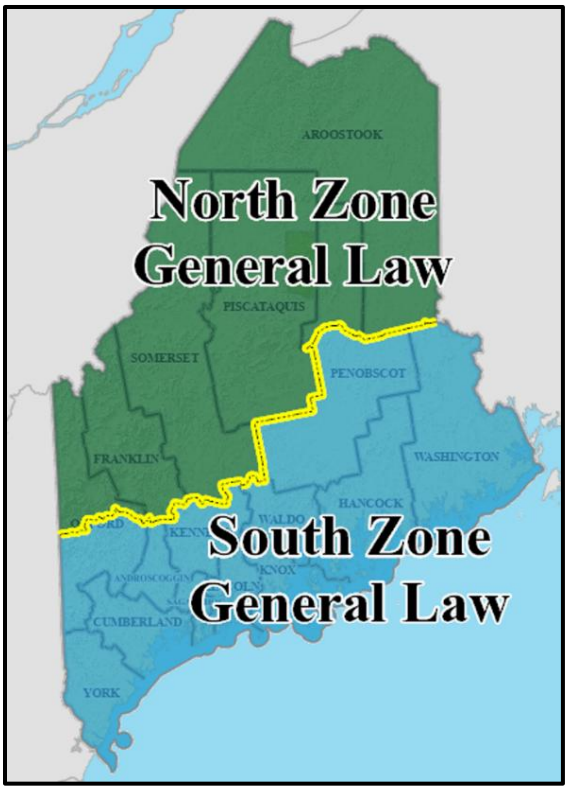


Figure 9. North Zone and South Zone delineation of Maine's freshwater fishing regulations.

In contrast, the general fishing law for Maine's North Zone prohibits the use of live bait fish because of the unique and relatively intact fisheries found throughout the region (Figure 9). Many North Zone waters support wild native salmonid populations such as Brook Trout, Lake Trout, Lake Whitefish, or Arctic Charr, which often exist with relatively few competing fish species, making these ecosystems particularly vulnerable to biological invasions. The introduction of nonnative bait fishes into these systems can substantially alter community structure, negatively affect native fisheries resources (Coulter et al. 2025), and in some instances result in the loss of native fish populations. The use of live bait fish is permitted in a limited number of North Zone waters, which are generally water bodies where legal bait fish species are already established, or their use does not pose a significant threat to the managed fish populations. These waters in the North Zone are managed with a water-specific special regulation (S-11), which permits the possession and use of live bait fish. Ensuring angler knowledge of these spatially variable regulations is critical for minimizing the risk of unauthorized species introductions and protecting Maine's fisheries resources.

Of the respondents that reported recreationally harvesting their own live bait fish (15%), harvesters reported relatively modest quantities annually, suggesting that recreational harvest of bait fish represents limited direct pressure on local bait fish populations. Cost savings,

convenience, and personal enjoyment were the most frequently cited motivations for harvesting bait fish. Accessibility also appeared to be an important factor, with more than one-quarter of recreational harvesters identifying access to bait retailers as a primary reason for harvesting their own bait. Several respondents noted that bait shops offering live bait fish for sale operate primarily during the winter season or have limited availability during open-water fishing seasons, reducing opportunities to purchase live bait fish.

Given the relatively high percentage of anglers harvesting their own bait fish, additional research into seasonal harvest patterns would improve understanding of whether live bait fish availability influences recreational harvest behavior. Similarly, information regarding how anglers maintain harvested bait fish would be of value. Future surveys could examine how anglers maintain their live bait fish, and whether it be in private bait tanks or holding boxes located in private or public waters. Information on the general location, seasonality, and duration of bait fish storage, particularly those held in “holding boxes” within private or public waters, could improve fisheries managers' ability to evaluate risks associated with unintended species introductions, pathogen transmission, and other ecological impacts.

Nearly one-third of respondents who did not report recreationally harvesting bait fish indicated an interest in learning how to legally harvest their own bait fish, suggesting opportunities for expanded outreach and education focused on legal harvest methods, bait fish identification, and applicable regulations would be of interest and benefit to anglers across the state.

Soft plastic lures were reported to be used more frequently than live bait fish overall, whereas the use of scented fish attractants was comparatively uncommon. Seasonal differences in gear use were also evident. Live bait fish use was greatest during the winter months, whereas soft plastic lure use peaked during the summer. These seasonal patterns corresponded with differences in target species. Landlocked Salmon, Brook Trout, and Lake Trout were among the species most frequently targeted with live bait fish, reflecting the popularity of ice fishing for coldwater species. In contrast, anglers using soft plastic lures during the summer seasons reported more frequently targeting largemouth bass and smallmouth bass.

Given the high frequency of use of soft plastic lures among survey respondents, continued education and outreach on soft plastic lure retention devices should continue to occur in an effort to reduce plastic waste in our freshwater ecosystems. Soft plastic lures and discarded lure fragments can remain in aquatic environments when lost or discarded, where they may be ingested by fish or other aquatic organisms. Previous research has demonstrated that ingestion of soft plastic lures can reduce growth rates and potentially affect fish condition in salmonids (Danner et al. 2009). With research demonstrating the negative impacts that soft plastic lure can have on Maine’s fisheries, it remains in the Department’s best interest to continue to educate anglers on best practices while using soft plastic lures to minimize the total amount of soft plastic lures discarded within inland waters.

Because participation in the survey was voluntary and respondents were disproportionately older than the overall population of licensed anglers, the findings may not fully represent the behaviors and preferences of all recreational anglers in Maine. Nevertheless, the survey provides valuable baseline information on recreational live bait fish use and harvest. These results will help to inform future outreach and educational initiatives, support evaluation of existing management strategies, and identify knowledge gaps that warrant additional research to better understand recreational bait fish use as it relates to Maine's fisheries resources.

References

Danner G. R., et al. (2009). *Voluntary ingestion of soft plastic fishing lures affects brook trout growth in the laboratory*. North American Journal of Fisheries Management, 29:352–360, DOI: 10.1577/M08-085.1

Maine Department of Inland Fisheries and Wildlife. (2021). *Inland fisheries and hatcheries strategic management plan, 2021–2035 (Vol. 1: Managing Maine's Inland Fisheries into the Future).*

COOPERATIVE

STATE FEDERAL

PROJECT

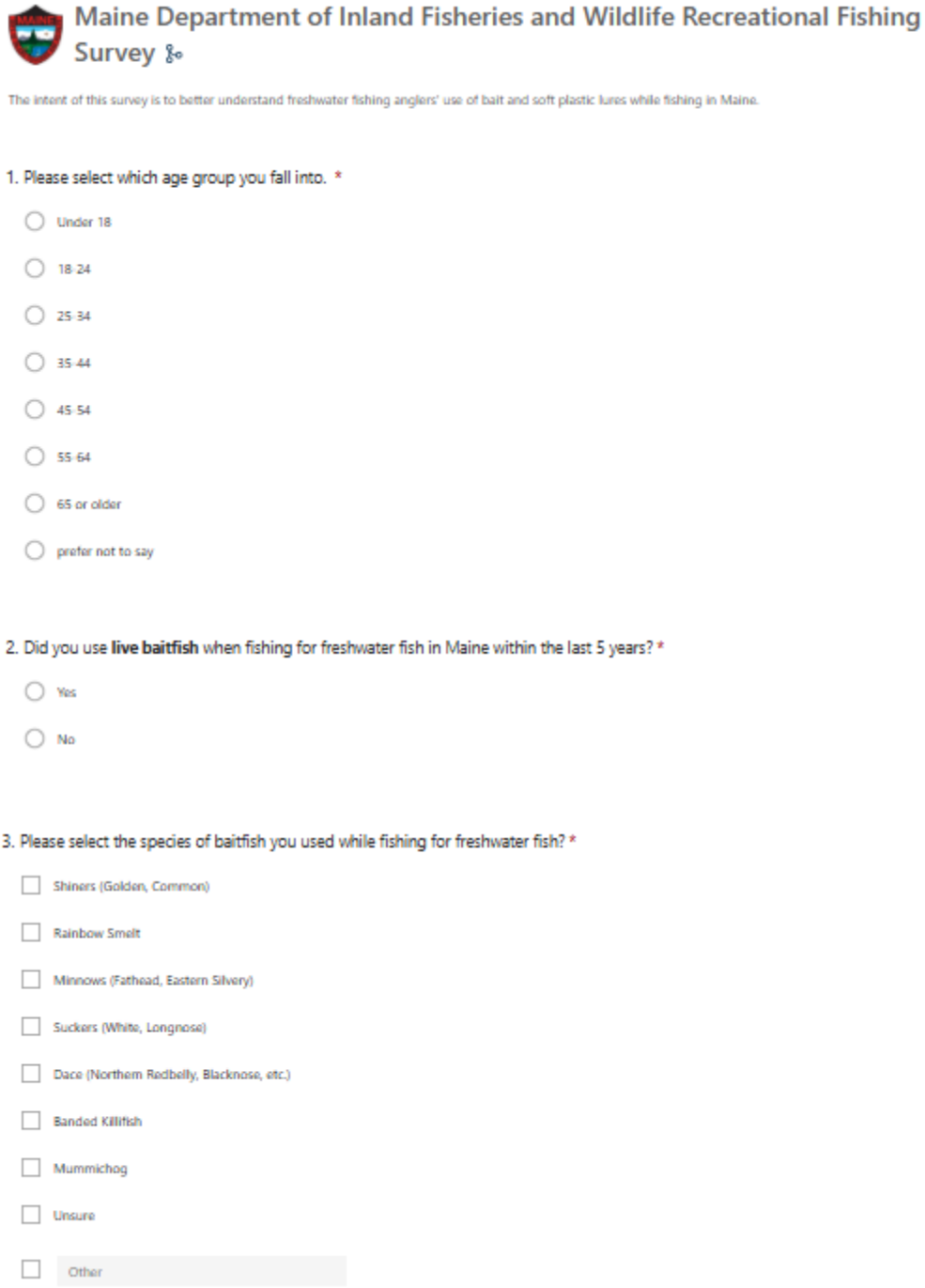
This report has been funded in part by the Federal Aid in Sport Fish Restoration Program. This is a cooperative effort involving federal and state government agencies. The program is designed to increase sport fishing and boating opportunities through the wise investment of angler's and boater's tax dollars in state sport fishery projects. This program, which was founded in 1950 was named the Dingell-Johnson Act in recognition of the congressmen who spearheaded this effort. In 1984 this act was amended through the Wallop Breaux Amendment (also named for the congressional sponsors) and provided a threefold increase in Federal monies for sport fish restoration, aquatic education and motorboat access.

The program is an outstanding example of a "user pays-user benefits" or "user fee" program. In this case, anglers and boaters are the users. Briefly, anglers and boaters are responsible for payment of fishing tackle, excise taxes, motorboat fuel taxes, and import duties on tackle and boats. These monies are collected by the sport fishing industry, deposited in the Department of Treasury, and are allocated the year following collection to state fishery agencies for sport fisheries and boating access projects. Generally, each project must be evaluated and approved by the U.S. Fish and Wildlife Service (USFWS). The benefits provided by these projects to users complete the cycle between "user pays – user benefits."

Maine Department of Inland Fisheries and Wildlife

353 Water Street, 41 SHS, Augusta, ME 04333-0041

Appendix A



Maine Department of Inland Fisheries and Wildlife Recreational Fishing Survey

The intent of this survey is to better understand freshwater fishing anglers' use of bait and soft plastic lures while fishing in Maine.

1. Please select which age group you fall into. *

- ○ Under 18
- ○ 18-24
- ○ 25-34
- ○ 35-44
- ○ 45-54
- ○ 55-64
- ○ 65 or older
- ○ prefer not to say

2. Did you use **live baitfish** when fishing for freshwater fish in Maine within the last 5 years? *

- ○ Yes
- ○ No

3. Please select the species of baitfish you used while fishing for freshwater fish? *

- ☐ Shiners (Golden, Common)
- ☐ Rainbow Smelt
- ☐ Minnows (Fathead, Eastern Silvery)
- ☐ Suckers (White, Longnose)
- ☐ Dace (Northern Redbelly, Blacknose, etc.)
- ☐ Banded Killifish
- ☐ Mummichog
- ☐ Unsure
- ☐ Other

4. Which freshwater fish do you typically target when using **live baitfish**? *

- [ ] Brook Trout
- [ ] Landlocked Salmon
- [ ] Lake Trout (Togue)
- [ ] Splake
- [ ] Rainbow Trout
- [ ] Brown Trout
- [ ] Burbot (Cusk)
- [ ] Largemouth or Smallmouth Bass
- [ ] Northern Pike or Chain Pickerel
- [ ] White Perch, Yellow Perch, Black Crappie, Sunfish
- [ ] Other

5. During which season(s) do you typically use **live baitfish** when fishing in Maine? *

- [ ] Spring
- [ ] Summer
- [ ] Fall
- [ ] Winter

6. Did you use **soft plastic lures/baits** when fishing freshwater in Maine in the last 5 years? *

- ( ) Yes
- ( ) No

7. What species did you target when using **soft plastic lures/baits**? *

- [ ] Brook Trout
- [ ] Landlocked Salmon
- [ ] Lake Trout (Togue)
- [ ] Splake
- [ ] Rainbow Trout
- [ ] Brown Trout
- [ ] Burbot (Cusk)
- [ ] Largemouth or Smallmouth Bass
- [ ] Northern Pike or Chain Pickerel
- [ ] White Perch, Yellow Perch, Black Crappie, Sunfish
- [ ] Other

8. During which season(s) do you typically use **soft plastic lures/baits** when fishing in Maine? *

- [ ] Spring
- [ ] Summer
- [ ] Fall
- [ ] Winter

9. Did you use **scented puddy, oils, or other attractants** when fishing with artificial lures in Maine in the last 5 years? *

- ( ) Yes
- ( ) No

10. What species did you target when using **scented puddy, oils, or other attractants**? *

- [ ] Brook Trout
- [ ] Landlocked Salmon
- [ ] Lake Trout (Togue)
- [ ] Splake
- [ ] Rainbow Trout
- [ ] Brown Trout
- [ ] Burbot (Cusk)
- [ ] Largemouth or Smallmouth Bass
- [ ] Northern Pike or Chain Pickerel
- [ ] White Perch, Yellow Perch, Black Crappie, Sunfish
- [ ] Other

11. Did you know that your recreational fishing license allows you to harvest your own baitfish? *

- ◯ Yes
- ◯ No

12. Do you recreationally harvest your own baitfish? *

- ◯ Yes
- ◯ No

13. What species of baitfish do you harvest? *

- [ ] Shiners (Golden, Common)
- [ ] Rainbow Smelt
- [ ] Minnows (Fathead, Eastern Silvery)
- [ ] Suckers (White, Longnose)
- [ ] Dace (Northern Redbelly, Blacknose, etc.)
- [ ] Banded Killifish
- [ ] Mummichog
- [ ] Other

14. Why do you harvest your own baitfish? *

- [ ] To save money
- [ ] More accessible than going to a bait shop
- [ ] For enjoyment
- [ ] To get a particular species or size of bait you may not have access to at a bait shop
- [ ] Other

15. How many individual baitfish do you typcailly harvest in a given year? *

- ( ) Less than 50
- ( ) 50 - 200
- ( ) 200 or more

16. Would you be interested in learning how to harvest your own baitfish? *

- ( ) Yes
- ( ) No