

2023 Baitfish and Smelt Wholesaler Survey Results

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Maine Department of
Inland Fisheries & Wildlife
Fisheries and Hatcheries Division

2023 Baitfish and Smelt Wholesaler Survey

Introduction

In 2019 the Maine Department of Inland Fisheries and Wildlife created a new position to coordinate commercial inland fisheries. A Senior Resource Biologist was hired to address deficiencies in the commercial fisheries program. This position led to improvements in data management, harvest reporting, regulatory review, and outreach. Part of the ongoing outreach included a survey, summarized herein, conducted in August of 2023. An internal collaborative effort was used to construct a survey in Microsoft Forms. The goal of the survey was to obtain more current baitfish and Smelt wholesaler perspectives to help prioritize commercial bait related projects. The survey also served as a method to investigate the ability of online surveys to engage with unrepresented stakeholder groups.

Questions included in the survey addressed concerns that have been voiced through previous stakeholder meetings and informal conversations with wholesalers. These concerns included electronic reporting, complexity of finding harvestable waters, licensing structure, and bait leaving the state. Other questions addressed internal knowledge gaps that influence bait availability including distances traveled to harvest and deliver bait, impediments to harvest, and local shortages of specific species. Open ended questions were also included for wholesalers to voice recommendations and concerns. A copy of the survey can be found as Appendix A.

Wholesalers were prompted to take the survey through email. Email reached most active harvesters, as 80% (246/309) of 2022-2023 bait wholesalers provided an email address when they purchased a license. Though 246 2022-2023 wholesale license purchases included an email, only 184 of those emails were unique due to individuals purchasing multiple licenses or sharing email addresses. On 9/27/2023 184 survey notifications were sent to unique wholesaler email addresses. Twelve of the email addresses resulted in bounce backs, resulting in 172 unique email addresses receiving a survey link. An automated reminder email was sent on 10/10/2023 to inform wholesalers that the survey would close on 10/15/2023.

Fifty-four survey responses were recorded. Two of the responses did not contain information and were removed from analyses resulting in a 30% (52/172) response rate. Respondents identified as having residences throughout the state with the exception of Lincoln and Waldo counties (Figure 1). The largest share of respondents, 12/52, reported residing in Kennebec County.

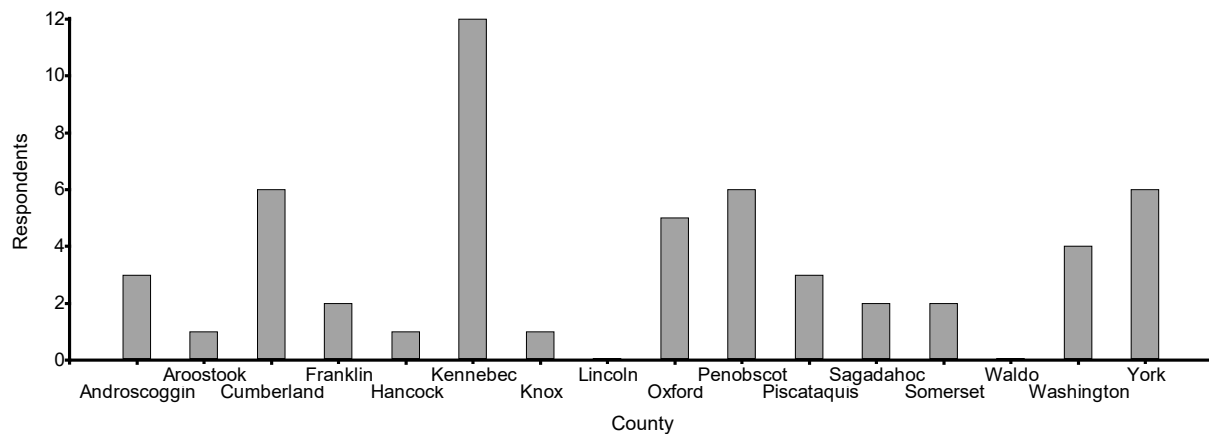


Figure 1 Self-reported counties of residence for Maine bait and smelt wholesalers that completed the survey (n = 52).

Respondents were asked if they harvested baitfish and if they harvested smelt (Appendix A). Individuals that answered “Yes” were then given a series of questions specific to the baitfish and/or smelt industry. Both baitfish and smelt portions of the survey began with the same series of Likert scale (Joshi et al. 2015) questions to gage sentiment regarding electronic reporting, electronic maps, complexity of licensing, complexity of open/closed water determination and the expense of license fees. The Likert scale responses were scored as follows: “Strongly Disagree” = 1, “Disagree” = 2, “Neutral” = 3, “Agree” = 4, “Strongly Agree” = 5, and “Unsure” = 3. The “Unsure” response was included to allow a post hoc analyses of indecision though was ultimately scored with “Neutral” due to the lack of unsure responses and the desire not to have unsure responses skew results toward agree or disagree. Both groups were then given a series of the same questions regarding sales, distances traveled and an open-ended box to provide suggestions. Baitfish harvesters received two additional questions regarding the difficulty of maintaining supplies of specific baitfish species.

Survey Results

The majority, 85% (44/52), of respondents reported harvesting baitfish and approximately half, 46% (24/52), of respondents reported harvesting smelt. The sentiment-based Likert scored questions displayed a high degree of similarity between baitfish and smelt wholesalers (Figure 2). The results indicate that wholesalers are open to reporting electronically. Both groups indicated that it is easy to determine which waters are open and closed and that they would prefer electronic maps. Both groups feel the license structure is not too complex and that

the current fees are not too expensive or too cheap. Lastly, most wholesalers do not want to share their contact information for public sales.

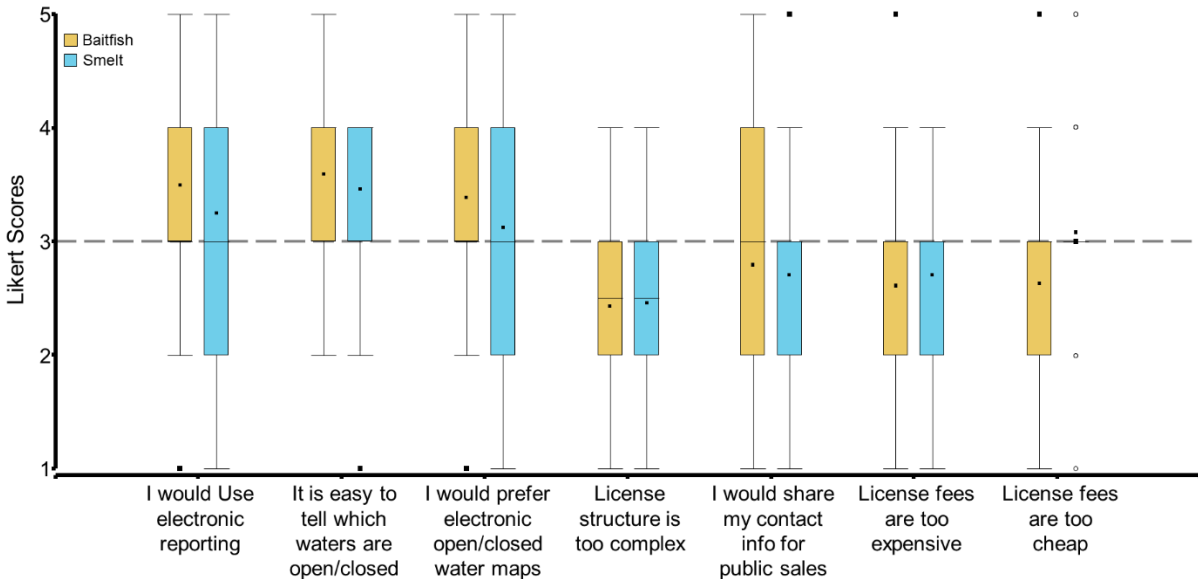
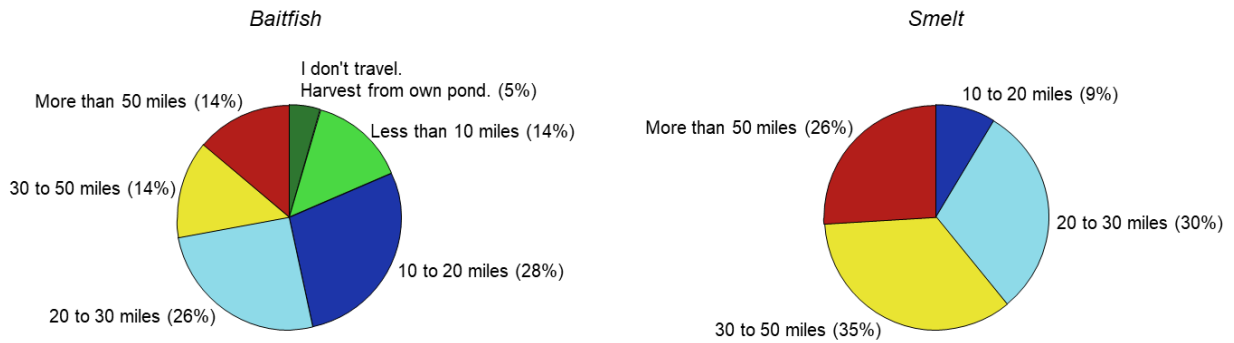


Figure 2 Boxplots displaying Likert scores for baitfish (n = 44) and smelt (n = 24) sentiment questions. The boxes depict 25th and 75th percentiles, and contain dots for the mean with a line for the median if it differs from the mean. Box “whiskers” extend to the minimum and maximum values, excluding outliers. Dots outside the boxes represent outliers that are at least 1.5 times greater than the range between the 75th and 25th percentiles. Smelt answers to “License fees are too cheap” do not display a larger box due to scores being tightly centered around neutral (11 of 24 responses). The dotted line represents a neutral response.

Following the sentiment survey, baitfish and smelt wholesalers were asked about the distances they travel to harvest and deliver fish (Figure 3A and 3B). Approximately half (47%) of baitfish wholesalers reporting traveling 20 miles or less on average to harvest fish, while only 9% of smelt harvests were conducted within 20 miles (Figure 3A). Most (61%) smelt harvesters reported traveling an average of 30 or more miles to harvest smelt. When asked about delivering fish to retailers, baitfish and smelt harvesters reported similarly (Figure 3B). Almost half of baitfish (41%) and smelt (48%) harvesters reported they do not sell to retailers and average distances traveled were similar between the two groups. Very few wholesalers, two baitfish and three smelt, reported selling bait outside of Maine.

A) Distance Traveled to Harvest Fish



B) Distance Traveled to Deliver Fish to Retailers

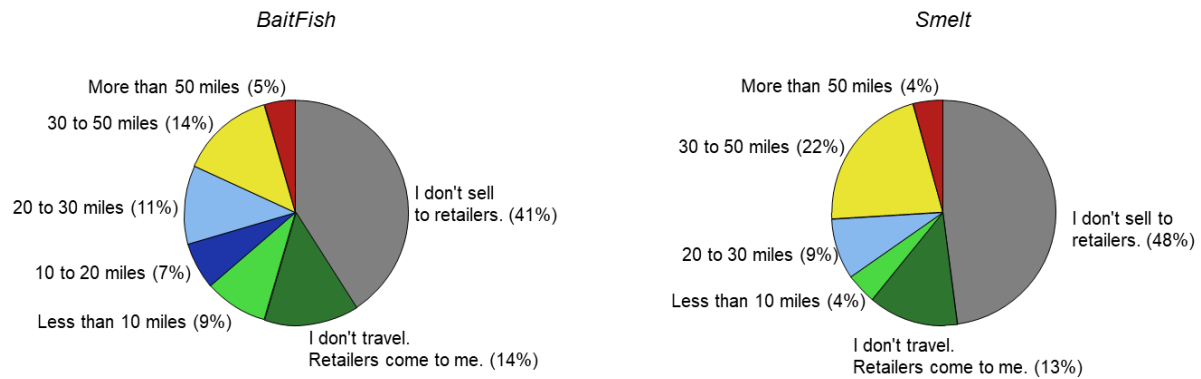


Figure 3 Wholesaler reported average distances to harvest (A) baitfish (n = 43) and smelt (n = 23), and deliver (B) baitfish (n = 44) and smelt (n = 23) with percentages.

The majority of baitfish (62%) and smelt wholesalers (91%) stated they are not able to meet demand. Wholesalers that stated they could not meet demand were then prompted to state why they believed they could not meet demand. Four multiple-choice reasons were available, and respondents could also input their own responses. Multiple responses were allowed for this question. Respondent answers were grouped into nine categories to allow summarization (Figure 4). For example, “lack of waters” combined answers like “Not enough open waters” and “Lack of waters within a reasonable driving distance”. Baitfish wholesalers were also asked if there were species they had trouble harvesting. Despite the question being about baitfish, the most common answer was smelt (7/23 or 30%) followed by “shiner” (26%), sucker (17%), Eastern Silvery Minnow (“emerald shiner”; 13%), Golden Shiner (9%) and Banded Killifish (4%).

Reasons Cannot Meet Demand

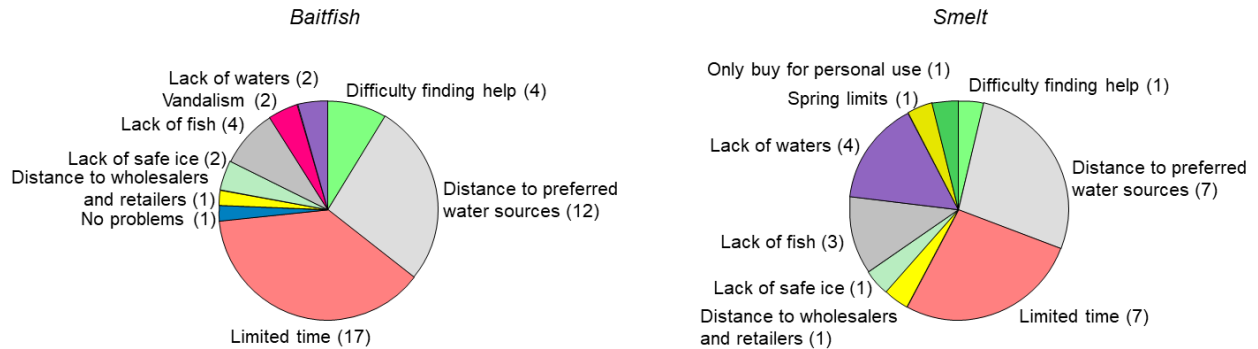


Figure 4 Reasons baitfish (n = 33) and smelt (n = 19) wholesalers stated they are not able to meet demand with response counts.

Lastly, respondents were prompted to make suggestions on how the baitfish and smelt industries could be improved. As open-ended questions, summarizing these answers proved more difficult. Answers were also complicated by respondents suggesting improvements for the smelt industry under the baitfish section. We chose to fit them into 10 different categories (Figure 5): 1) Simplify laws, 2) Open more waters, 3) Attract harvesters, 4) Simplify reporting, 5) Ban recreational harvest, 6) Implement size or bag restrictions, 7) Restrict number of permits, 8) Don't change, 9) Provide species maps, 10) Increase bag limits. "Simplify laws" responses indicated the laws were difficult to understand and access. "Open more waters" responses were generally in regard to smelt waters, even under the baitfish section; however, several were specific to baitfish, specifically not agreeing with restrictions due to invasive plants. "Attract harvesters" was recorded for an individual that believes we need to educate and attract younger people to the industry. "Simplify reporting" was recorded for an individual that believes the reporting form should be altered. "Ban recreational harvest" responses stated that preventing recreational harvest of personal bait would improve the industry. "Size and bag restrictions" responses were from individuals that believe we should place length restrictions on bait fish, or implement/alter baitfish and/or smelt bag limits. "Restrict number of permits" responses stated that the total number of permits should be capped, or there should be water specific permit quotas. "Don't change" responses stated that they did not want us to alter our regulations. "Provide species maps" was from an individual that stated it would help to know where specific

baitfish species could be found. “Increase bag limit” responses were from individuals that wanted spring smelt bag limits to be increased.

Suggestions for Improving Bait Industry

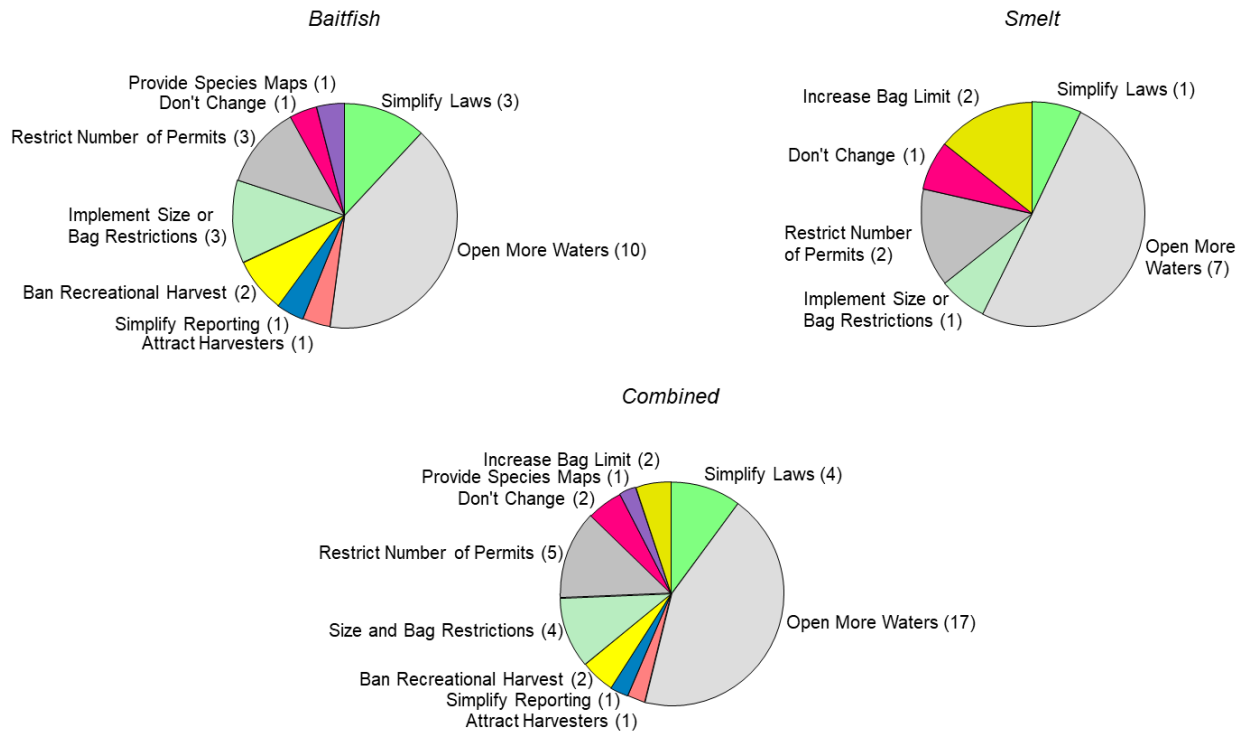


Figure 5 Summarization of open-ended suggestions to improve the baitfish (n = 25) and smelt (n = 14) industries with response counts. Combined figure includes both baitfish and smelt responses.

Conclusions

The survey provided contemporary information from Maine’s commercial bait harvesters. The 30% (52/172) response rate we received through this email survey was lower than the average online survey response rate of 44% but was higher than the suggested rate of 20-25% for sample sizes under 500 (Wu et al., 2022). Recently South Dakota conducted a comparable study looking at public sentiment toward native fish management. Despite their mailed survey having a low response rate of 21%, broader coverage follow up surveys supported the conclusions drawn (Gigliotti and Fopma, 2019). We believe the responses we received were representative of commercial wholesalers and adequate to inform management actions.

Based on the Likert sentiment scores, most harvesters seemed willing to use electronic reporting. However, we recognize our digital survey may have biased the results toward harvesters more open to electronic mediums. No respondents indicated in the open-ended questions that we should end reporting. Wholesalers appear to see the value in reporting, or simply no longer view it as an unnecessary burden. Alternatively, individuals that see reporting as a burden may have also viewed the survey as a burden and not participated.

Some of the survey results provided conflicting responses when comparing open ended questions to multiple choice options. The sentiment scores indicated that wholesalers had no trouble determining open/closed waters or navigating the license structure, two of the largest elements of the wholesale legal structure. However, several respondents used the open-ended questions to state a need for simplified laws. They also indicated they would prefer electronic maps and one individual asked for maps that provide information on the bait species present in waterbodies to make targeting them easier.

The majority of wholesalers stated they would not want their contact information shared with the public for sales. This seems at odds with the commercial nature of wholesale. However, given that approximately half of wholesalers stated they do not sell to retailers and a majority cannot meet current demand, it does seem reasonable that they would not want to be contacted by other retailers and the public.

License fees haven't increased since 2005 when baitfish and smelt wholesale licenses increased \$2, from \$24 to \$26 and from \$69 to \$71 respectively, and sentiment scores indicate wholesalers don't want the prices to increase or decrease. However, previous stakeholder groups found that some wholesalers, especially smelt wholesalers, want the fees to increase substantially to limit the number of fishery participants. The open-ended questions reflect some of this thinking in the number of respondents that want to restrict the number of permits issued.

Traveling great distances to harvest fish is an inconvenience and may be problematic in regard to the spread of aquatic invasive species. Previous analyses of commercial harvest data indicates that an unequal share of harvests are conducted in South-Central Maine. This is especially true for smelt where in 2023 38% of smelt harvest events and 43% of smelt harvested came from Region B (Belgrade Lakes Region). Region B also accounted for 25% of the baitfish harvested in 2023 despite accounting for a disproportionate 17% of harvest events. South-Central Maine contains some of the most nutrient rich productive waters in the state, which may explain

why more wholesalers are based out of Kennebec than any other county. Unfortunately, the increased productivity also means these waters often have populations of invasive species as they are more susceptible to establishment. Opening additional waters could reduce harvest pressure on these more problematic areas and slow the spread of invasive species. However, opening waters could also encourage the spread of invasives through harvest gear movements between highly invaded and non-invaded areas of the state.

Suggested Actions

Survey responses indicated three areas in which management efforts should be concentrated to address perceived issues. These areas include, 1) Creating methods to streamline and simplify harvest reporting, such as electronic reporting, 2) Publishing electronic maps of open and closed waters that include baitfish species presence, 3) Altering the smelt waters list to increase the odds of harvest success while dispersing harvest throughout the state. The ability to report electronically should reduce the amount of time wholesalers spend reporting, lead to more timely and accurate data, and reduce the number of wholesalers that do not report. Electronic reporting should be optional during an extended adoption period to allow some individuals to submit paper reports. Electronic maps of opened and closed waters are currently being proofed to ensure the intent of regulations are accurately reflected in text descriptions. Once proofed, efforts should be made to document the distribution of baitfish throughout the state to include these data in the open and closed water maps. Lastly, the smelt waters list needs revision to more accurately reflect the presence of harvestable smelt populations and to better distribute those harvests geographically. Opening waters to commercial smelt harvest is complicated by the conflicting management purposes of providing a forage base for sport fisheries and offering opportunities for recreational smelt harvest.

As some respondents stated, waters on the list include waters that do not contain harvestable smelt populations. Waters that do not contain smelt should be removed. Further, opening smelt waters may take pressure off some heavily fished systems and could decrease the distances driven by harvesters. Several individuals suggested rotating waters. Though rotations could allow populations to recover following high harvest, wholesalers may already be self-regulating by moving waters when catches decline. Moreover, we currently lack information regarding the primary factors driving smelt abundance. If wholesale harvest is a major driver,

then relieving harvest pressure may allow for increased bait supply. Conversely, if environmental conditions are more of a factor, then supplies may be negatively impacted by inadvertently closing abundant waters and opening unproductive waters. We require scientific studies to determine the major drivers of smelt abundance to appropriately manage commercial harvest and aid in sport fish management.

References

Joshi, A., Kale, S., Chandel, S., & Pal, D. K. (2015). Likert scale: Explored and explained. *British journal of applied science & technology*, 7(4), 396-403.

Wu, M. J., Zhao, K., & Fils-Aime, F. (2022). Response rates of online surveys in published research: A meta-analysis. *Computers in Human Behavior Reports*, 7, 100206.

Gigliotti, L. M., & Fopma, S. J. (2019). Low survey response! Can I still use the data?. *Human dimensions of wildlife*, 24(1), 71-79.

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."



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Commercial Bait Wholesale Survey (for print)

This is a survey to gauge commercial wholesaler opinions to help prioritize and guide future planning.

**If you have questions, contact Jerrod Parker: Jerrod.Parker@maine.gov



Please provide your contact information

*We will not share this information, but it may be used to contact you for follow up questions.

1. Full name

2. Email address

Baitfish

3. Do you harvest Baitfish?

Yes

No

Smelt

4. Do you harvest Smelt?

Yes

No

Baitfish Questions

5. Select the response that best represents your opinion in regards to **Baitfish**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Unsure
I would use electronic harvest reporting forms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy to determine which waters are open and closed to commercial harvest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would prefer electronic maps of open and closed waters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The current license structure for commercial bait and smelt is too complex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would share my contact information with the public for bait sales	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
License fees are too expensive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
License fees are too cheap	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Do you retail direct to anglers?

Yes

No

7. Are you able to supply enough fish to meet demand?

Yes

No

8. If you are unable to meet demand, what are the main reasons (select all that apply)?

Distance to preferred water sources

Delivery distance to retailers

Limited time

Difficulty finding help

Other

9. Do you have trouble harvesting specific species of fish?

Yes

No

10. If you do have trouble harvesting specific species, which species are they?

11. On average, how far do you travel one way to harvest baitfish?

I don't travel. I harvest from my private pond.

Less than 10 miles

10 to 20 miles

20 to 30 miles

30 to 50 miles

More than 50 miles

12. On average, how far do you travel one way to deliver baitfish to retailers?

- I don't sell to retailers.
- I don't travel. Retailers come to me.
- Less than 10 miles
- 10 to 20 miles
- 20 to 30 miles
- 30 to 50 miles
- More than 50 miles

13. Do you wholesale baitfish outside of Maine?

- Yes
- No

14. Do you have any suggestions to help improve the live baitfish industry in Maine?

Smelt Questions

15. Select the response that best represents your opinion in regards to **Smelt**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Unsure
I would use electronic harvest reporting forms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy to determine which waters are open and closed to commercial harvest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would prefer electronic maps of open and closed waters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The current license structure for commercial bait and smelt is too complex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would share my contact information with the public for bait sales	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
License fees are too expensive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
License fees are too cheap	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Do you retail direct to anglers?

- Yes
- No

17. Are you able to supply enough fish to meet demand?

Yes

No

18. If you are unable to meet demand, what are the main reasons (select all that apply)?

Distance to preferred water sources

Delivery distance to retailers

Limited time

Difficulty finding help

Other

19. On average, how far do you travel one way to harvest smelt?

Less than 10 miles

10 to 20 miles

20 to 30 miles

30 to 50 miles

More than 50 miles

20. On average, how far do you travel one way to deliver smelt to retailers?

I don't sell to retailers.

I don't travel. Retailers come to me.

Less than 10 miles

10 to 20 miles

20 to 30 miles

30 to 50 miles

More than 50 miles

21. Do you wholesale smelt outside of Maine?

Yes

No

22. Do you have any suggestions that would help improve the inland commercial Smelt industry in Maine?

Thank you for your responses.

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