

Tradition in Transition:

Fishing, Hunting, and Food Security in a Changing Maine

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ABSTRACT

We explore how rural Maine people, who have a long heritage of fishing and hunting, are navigating impacts from environmental contamination and climate change. Two surveys conducted in collaboration with Maine's Department of Inland Fisheries and Wildlife: one with Maine fishing license holders and another with Maine hunting license holders allow for an in-depth exploration of current fishing and hunting habits, including reliance on wild foods for sustenance, concern about environmental contaminants such as PFAS, and views on climate change. This research documents how rural Maine residents are adapting traditional practices amidst evolving environmental challenges, highlighting areas for targeted outreach and policy considerations to support food security and rural traditions.

food” (USDA ERS 2025a). Hunting and fishing may offer a way to combat food insecurity for Maine residents and research has found increased foraging for wild foods and cultivation of home food during the COVID-19 pandemic (Hall 2021; Niles et al. 2024), suggesting that increased food insecurity during this time may have expanded Mainers' efforts to procure wild fish and game. Therefore, any threats to the safety of harvested wild fish and game meat could have health impacts for Maine residents who rely on hunting and fishing to support their food security.

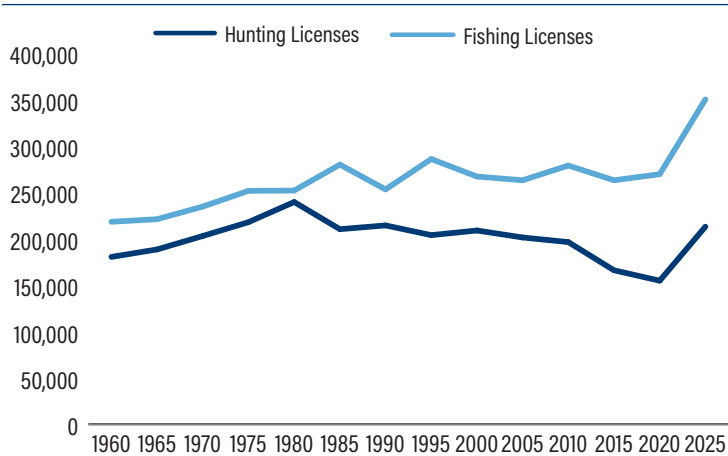
HERITAGE AND FUTURE OF MAINE'S WILD HARVEST

Maine is known for its rugged landscapes, and residents and visitors alike enjoy the outdoors through fishing and hunting. These traditions also matter economically: anglers contribute about \$319.2 million and hunters about \$338.7 million to total activity in Maine (Southwick Associates 2015). There has been a sharp increase in the number of hunting and fishing licenses issued since the start of the pandemic in 2020 (Figure 1). Between 2020 and 2025, the number of Maine hunting license holders rose 38 percent, from 154,580 to 212,780, after four previous decades of decline. Fishing license numbers, which had been relatively stable, also grew significantly over the same period (from 269,316 to 349,919, or 30 percent). The out-of-state share of hunting licenses, permits, and stamps varies year to year, but has trended down from about 20 percent in the early 2000s to about 15 percent in recent years, whereas the out-of-state share of annual fishing licenses sold has consistently remained near 30 percent during the same time frame.¹

According to Feed America, in 2023 over 13 percent of Mainers are considered food insecure,² which the USDA defines as “limited or uncertain access to adequate

Environmental contamination is a potential threat to Maine's wild fish and game, and the outdoor sportspeople who consume them. Maine has a long-standing health advisory to limit fish consumption from Maine's freshwaters due to mercury contamination. A more recent issue involves PFAS (per- and polyfluoroalkyl substances), as the Maine Department of Environmental Protection has identified sites with contaminated soil and groundwater³, and research shows these chemicals can accumulate in wildlife, including wild game consumed by humans (Death et al. 2021). This is concerning because PFAS has known negative human health impacts including lower vaccine response, certain types of cancers, and complications during pregnancy (National Academies 2022). The Maine Department of Inland Fisheries and Wildlife (MDIFW), in collaboration with other Maine agencies, has launched an extensive testing effort to define PFAS contamination in both fish and wild game. The results led to PFAS consumption advisories in specific geographic areas for deer, wild turkeys, and freshwater fish.⁴ From the context of Maine's changing environment, and food security needs, we investigate the knowledge and habits of people who hold Maine fishing and hunting licenses.

FIGURE 1: **Number of Maine Hunting and Fishing License Holders, 1960 to the Present**



SURVEY METHODS AND RESPONDENTS

Survey Sample and Design

We rely on two unique data sets to learn about Maine angler and hunter behaviors. First, in August 2024, we administered an online survey via email invitation to a sample of 36,500 Maine fishing license holders, where 1,500 of those invitations were from each year from 2014 to 2022, 10,000 were from lifetime license holders, and 25,000 were from 2023 license holders. Only respondents who reported fishing in the last 12 months were included in the current analysis. Participants were asked about their fishing activities in the past 12 months, and respondents were allowed to skip questions and saw different questions based on their responses. For example, we asked anglers to document the fish they caught and then only asked consumption questions about those species of fish. Therefore, the number of respondents who answered individual questions varied. This angler survey consisted of four sections that examined (1) fishing background, (2) consumption behavior, (3) knowledge and concern about environmental contaminants, including PFAS, and (4) demographics. Second, in April 2025, we administered an online survey via email invitation to a sample of 2024 Maine hunting license holders (153,572 initially emailed). This included resident license holders, nonresident license holders, and lifetime license holders. Similar to the angler survey, respondents were allowed to skip questions and saw different questions based on their responses to prior questions, which led to

an inconsistent number of responses for individual questions. This hunter survey included four sections that examined (1) hunting background, (2) consumption behavior, (3) knowledge and concern about environmental contaminants, including PFAS,⁵ and (4) demographics. We recognized that some of our participants might learn about potential environmental contaminants through the survey. Both surveys were reviewed by Maine state agencies to ensure that the information provided (for example, PFAS impacts, current advisories), was accurate and consistent with agency needs and goals.

Respondents

The survey samples were designed to include the diverse range of hunting and fishing license holders, including different ages, genders, places of residency, and license types. However, respondents to the survey may differ from the sample (Table 1). Because we sent our survey via email, our sample was limited to, and representative of, the license holders who provided an email address to MDIFW when they bought a license. Not all participants completed all sections of the survey and therefore usable responses differ by question. By geocoding MDIFW licensing data, we were able to classify some respondents as urban or rural residents using census data. In the angler survey we identified a subset of 2,613 respondents as Maine residents with 77.4 percent (2,023) being rural residents. For the hunter survey, we identified a subset of 10,089 respondents who were Maine residents, 82.9 percent (8,362) of whom were rural respondents. Responses from out-of-state residents or cases where residency could not be confirmed are excluded from urban, rural designations but included in the overall survey totals.⁶

Limitations

The funding and scope of the two surveys (i.e., hunters and anglers) differed, which limited direct comparisons between certain aspects of the survey data. Publicly available licensing data allowed us to determine residency of most respondents, but some data was incomplete, and there were occasionally discrepancies between self-reported residency and licensing residency. Although our sample sizes for both surveys were large, our response rates were low (around 10 percent) which makes nonresponse bias a concern (Groves and

TABLE 1: Demographic Characteristics of Survey Samples and Respondents

Survey	Gender (% Male)	Age (mean, years)*	Income (median household)**	Education (years in school)**
Anglers				
All angler respondents	80%	57	\$102,736	14.9
2023 annual angler license holders	76%	46	-	-
Lifetime angler license holder	83%	64	-	-
Rural Maine anglers	80%	57	\$100,485	14.7
Hunters				
All hunter respondents	85%	54	\$104,100	14.5
2024 annual license holders	85%	67	-	-
Hunting lifetime license holders	85%	61	-	-
Rural Maine hunters	84%	54	\$103,072	14.5

*Information calculated using licensing data, excludes U-18 license holders

** Self reported income and education levels

Peytcheva 2008). However, survey response rates have been declining for decades (US BLS 2025), with particularly steep declines in the post-COVID era (Eggleston 2024), which may exacerbate sampling bias. Enthusiasm bias in responses to web surveys, particularly among anglers, is well documented (Ryan et al. 2025), but because our sampling frame was license holders who gave MDIFW their email addresses, we acknowledge our sample was already a highly engaged population. We control for demographics in our statistical analysis, although enthusiasm and other unobservable traits are likely to contribute bias to our findings (Wu et al. 2022).

RESULTS

Fishing and Hunting Patterns

Both anglers (82 percent of respondents) and hunters (91 percent of respondents) find their sport relaxing, and 67 percent of anglers find it a great way to socialize with family and friends. The anglers in our survey report fishing between 4 and 11 days per year for an average of 32 years. Most fish during the summer with the three most popular fishing locations reported as Moosehead Lake, Sebago Lake, and the Kennebec River, although there were a wide variety of favorite destinations. Most anglers targeted bass (largemouth and smallmouth), trout (brook and lake), and landlocked salmon. Eastern brook trout were eaten most often, with 42 percent of anglers who catch them reporting that they also

consumed their catch. Other frequently consumed species include landlocked salmon, white perch, and lake trout.

Respondents to our hunter survey reported that they have been hunting for an average of 28 years. When asked which wildlife management district (WMD) they hunted in, 10 percent of all respondents reported hunting in WMD 17, located in central Maine and including parts of Skowhegan, Pittsfield, Hermon, and Dover-Foxcroft; it was by far the most popular district. Other popular areas, with around 5 percent to 6 percent of hunters reporting them, include WMD 21 in Cumberland County (Buxton-Auburn, including Sebago area), WMD 23 in

south-central Maine (Fairfield, China, Madison, Solon, Sidney, and parts of Augusta), WMD 20 in interior York County, WMDs 25 and 26 from the midcoast up through Penobscot Bay (including Brewer/Bangor).

Wild Food and Food Security
Recreational vs consumptive use

While most respondents engage in both fishing and hunting for recreation, hunters are significantly more likely than anglers to report harvesting wild game for food. Seventy-six percent report hunting for food compared to just 9.7 percent of anglers who fish for food. Catch and release is popular with anglers, and 90 percent do so occasionally and 48 percent, exclusively. Only 46 percent of anglers report consuming any fish they catch, in contrast to 93 percent to 99 percent of hunters (depending on species) who report consuming the animal they harvest. Differences in consumption patterns between angling and hunting are expected, given that there is no catch and release in hunting, and because game animals provide a greater volume of meat as compared to freshwater fish. Larger animals are associated with longer household consumption durations. On average, respondents reported that meat from wild turkey and waterfowl lasted for about two months, while meat from bear and deer lasted for about seven months. Moose meat lasted the longest, at just over ten months. Self-reported portion sizes ranged from an average of 6.3 ounces across all

fish species to an average of 7.3 ounces across all game species.

Food security and home and wild food procurement

Home and wild food procurement increased during the COVID-19 pandemic (Hall 2021). Recent studies demonstrated that households in Maine that struggled with food security were more likely to engage in wild food procurement and that the practice improved food security, particularly when a household had recently become food insecure (Niles et al. 2024). Using the full USDA food security questionnaire was not possible in our survey instrument, but we did include some food security questions such as, “Is fishing important to your household’s food security?” with a basic USDA definition for context (USDA ERS 2025b). We also included a bank of questions about animal husbandry, gardening, and foraging to assess their reliance on other food procurement strategies. Overall, we found that 7 percent of all anglers and 63 percent of hunters considered fishing and hunting to be important to the food security of their household. Among Maine residents, rural anglers (8 percent) were statistically more likely than urban anglers (4 percent) to view fishing as important for their food security. The difference was even more pronounced among hunters, with two-thirds of rural hunters (66 percent) considering hunting important to their food security compared to slightly more than half of urban ones (53 percent).

To further explore these relationships, we ran logistic regressions to explore the demographic differences around self-reported reliance on home and wild food procurement in both of our respondent groups. Rural Maine anglers who considered fishing important to their food security, and rural Maine hunters who considered hunting important to their food security, were between 4 and 12 percentage points statistically more likely to grow, preserve, or forage food for their household (depending on the category) than urban anglers and hunters, respectively. There was no statistically significant difference between rural and urban Maine hunters who reported fishing for food. Interestingly, however, rural anglers were 20 percentage points more likely to report hunting for food than their urban counterparts.

Other demographic trends

With all other demographic characteristics constant, rural Mainers were significantly more likely to engage in home and wild food procurement than urban

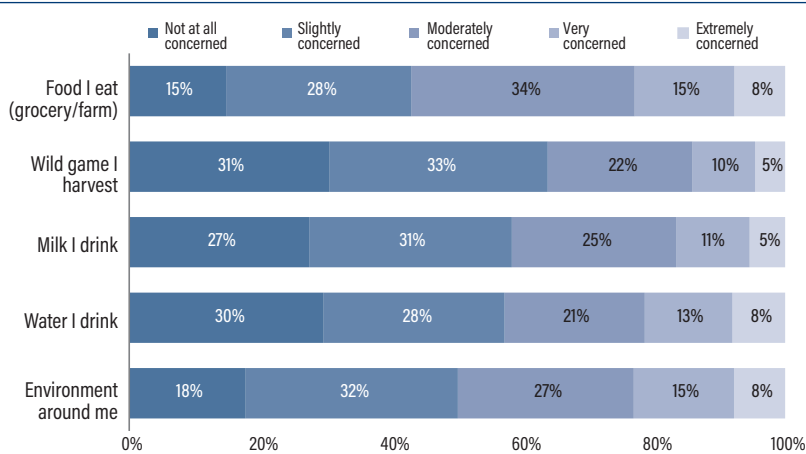
Mainers. Rural Mainers and all men were more likely to think both home and wild food procurement were more important to food security. Across the full survey sample, men were more likely to report hunting, fishing, foraging, and raising animals for food, while women were more likely to garden and can or preserve food. There was a weak, but positive and significant, association between education and gardening, foraging, and canning or preserving. Older, more educated, and higher-income Maine residents were slightly less likely to consider fishing and hunting important to their food security. Our regression analysis also found a weak but positive relationship between income and anglers who hunt and hunters who fish, suggesting that higher-income people are more likely to recreationally hunt and fish for food, despite not considering it to be important to their food security. Research suggests that higher incomes reduce some barriers, such as appropriate gear, to wild food procurement (Niles et al. 2024).

Environmental Contaminants and PFAS

Awareness of environmental contamination

Hunters and anglers both reported high levels of awareness of environmental contaminants. It is important to note, however, that differences in wording about PFAS and other contaminants between the instruments may limit the direct comparability of responses. Eighty-eight percent of hunters reported having heard of PFAS; while 60 percent of anglers reported having heard of PFAS in Maine’s lakes and rivers. Ninety percent of hunters had heard of mercury, and 71 percent of anglers had heard about mercury in Maine’s lakes and fish. Regression analysis showed older respondents, men, and respondents with higher education and income were statistically more likely to be aware of PFAS contaminants. While most hunters and anglers were familiar with environmental contaminants in the broader context, over one-third (35 percent of anglers and 39 percent of hunters) were unaware or unsure if they had heard of a specific consumption advisory. Comparing knowledge of contaminant-specific consumption advisories among anglers and hunters reveals notable differences. While both groups are aware of mercury advisories (48 percent hunters and 52 percent anglers), hunters were significantly more likely to report awareness of PFAS-related advisories (74 percent) compared to anglers (31 percent). Regression analysis finds that across the entire sample of angler respondents, those who reported having heard of any type of “do not eat” or “limit consumption”

FIGURE 2: **Hunters' Responses to Question about Contaminants in Food**



Note: Full question, "To what extent are you concerned that there may be contaminants in food?" n = 11,283

advisory for fish were more likely to be older and male. These findings suggest that while a majority of outdoor users are informed, a substantial portion may not be receiving or retaining key public health information about consumption advisories (Wang et al. 2024).

Concern and risk perception

Understanding the concerns of anglers and hunters about environmental contaminants is essential for interpreting how risk awareness translates into behavior (Diana et al. 1993). In our survey, we asked anglers, "How concerned are you about environmental contaminants in Maine's fish?" on a scale from 0 (not at all concerned) to 10 (extremely concerned). The average level of concern among anglers (n = 3,262) was 5.74, indicating a moderate level of perceived risk. Hunters' concerns about contaminants were assessed through a similar, but slightly different, metric. To evaluate risk perception related to PFAS, we asked hunters to rate their level of concern using a five-point Likert scale (1 = not at all concerned to 5 = extremely concerned) across five potential exposure pathways: store-bought food, wild game, milk, drinking water, and the surrounding environment (Figure 2). Responses indicated moderate concern overall, with variation depending on the source. Interestingly, hunters were more concerned about contaminants in food from grocery stores or farms than about the wild game they harvest.

Trust in institutions

Understanding respondents' trust in agencies and other information sources is crucial for assessing the effectiveness and impact of consumption advisories on hunting and fishing behaviors (Suhay et al., 2022). Our survey asked Maine anglers about their trust in state agencies responsible for creating safe fish consumption guidelines on a scale of 0 to 10 (0 = strongly don't trust; 10 = strongly trust). The average trust score across all respondents was 7.12 (n = 3,027), indicating a moderately high level of trust. Urban respondents reported a comparatively, but not significantly, higher average trust score (7.19, n = 505) compared to rural respondents (6.75, n = 1717). Maine anglers rated both the accuracy and clarity of state-issued fish consumption advisories. On average, respondents gave a score for accuracy of 7.4 (n = 2,084), and a score for understandability of 7.6 (n = 2,104), indicating generally positive perceptions. Urban respondents reported significantly higher average ratings compared to their rural counterparts: for accuracy, urban Mainers averaged 7.6, whereas rural Mainers averaged 7.4; for understanding, urban respondents averaged 7.8, compared to 7.5 for rural respondents. Regression analysis suggests that the pattern of lower trust among rural residents remains even after controlling for income and education. These patterns may reflect differences in access to information, exposure to state communication channels, response bias, or baseline trust in public institutions. Strengthening outreach in advisory messaging, especially in rural areas, can help ensure that all Mainers can make informed decisions about wild game consumption (Polter et al., 2024).

The survey also asked respondents about the reliability of specific entities when it comes to information about environmental contaminants that may affect fishing. Thirty-four percent of Maine anglers ranked university scientists as very reliable, with 28 percent finding MDIFW game wardens to be very reliable, followed by federal scientists (27 percent), sportsmen's organizations (26 percent), conservation groups (26 percent), and non-IFW Maine scientists (11 percent). When disaggregated by residence, urban anglers were consistently more likely than rural anglers to rate all sources as very

reliable, suggesting differences in institutional trust that may reflect broader disparities in information access or engagement (Bonnie et al. 2022).

Hunters in Maine expressed that the use of the best science in developing consumption guidelines is important to them (80 percent strongly agree/agree) and have confidence that Maine agencies are using the best science (71 percent strongly agree/agree), with lower confidence in federal agencies (35 percent strongly agree/agree). Hunters also reported trusting Maine agencies to provide safe hunting/game information (69 percent strongly agree/agree), but they have lower trust in federal agencies to provide this information (36 percent strongly agree/agree). However, urban hunters consistently reported higher levels of agreement with these statements about trust in institutions than their rural counterparts, with differences that are statistically significant. These patterns suggest that while institutional trust is generally strong among hunters, rural populations may exhibit greater skepticism, highlighting the importance of tailored outreach and communication strategies (Bonnie et al. 2022).

Changes in behavior

Given hunters' and anglers' strong awareness of and concern about environmental contaminants, it is essential to determine whether these concerns are driving meaningful changes in their behavior. To begin documenting this, we collected information about the frequency of their activities in the last 12 months compared to previous years. While a majority of both groups (47 percent anglers and 51 percent hunters) indicated they fished or hunted about the same amount as in previous years, 26 percent of hunters and 16 percent of anglers reported increased activity in recent years. In reporting decreased activity, anglers were significantly more likely to say they fished less this year (38 percent) compared to hunters and hunting (23 percent). For both activities the top reason for the decrease was being too busy. Of the anglers (hunters) who reported that they fished (hunted) less and provided a reason for the decrease, 2.7 percent of anglers said it was because it was unsafe to eat fish (2.9 percent of hunters, wild game meat). Overall, 2 percent of both anglers and hunters reported their decreased activity was due to concerns about environmental contamination. This finding suggests that few people are changing their hunting or fishing behaviors due to potential environmental contamination.

Environmental contaminants and food security

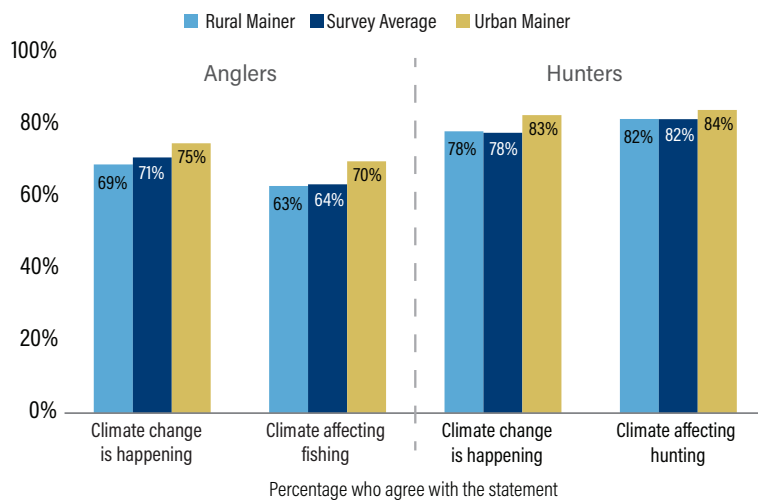
Anglers who consider fishing important to their food security were less likely to have heard of PFAS in Maine's lakes or fish. Since PFAS is an emerging contaminant, and there are no statewide-level consumption advisories for PFAS as there are with mercury, this is not unexpected. When we control for demographic characteristics, however, the negative association reverses and is no longer statistically significant. This finding suggests that differences in PFAS awareness are better explained by underlying demographics or unobserved characteristics rather than by an angler's perception of fishing as important to their food security. Among hunters, those who agreed that hunting is important for their food security were more likely to have heard of state-issued "do not eat" or "limit consumption" advisories than those for whom hunting was not important for food security, even after controlling for demographic variables. This subset of hunters was also more likely to have heard of the four contaminants covered in consumption advisories: lead, mercury, PFAS, and cadmium, which is good news from a public health viewpoint.

Climate Change

Because hunting and angling rely on Maine's natural conditions, we included climate change questions in both surveys to better understand participants' environmental perceptions. Overall, respondents evinced strong belief in climate change and its impact on Maine landscapes. In both surveys, respondents reported seeing evidence that climate change in Maine is affecting both fishing and hunting opportunities (Figure 3).

Among both anglers and hunters, we found that rural Maine residents were less likely to agree that global climate change is happening when compared to their urban counterparts. They were also less likely to agree that climate change is affecting fishing and hunting in Maine. However, it is important to note that although urban and rural Maine residents differ significantly from each other about climate change, rural Mainers are not statistically different from the overall survey average for the four climate questions, although this is likely because they comprise the majority of our sample. The differences between the rural and urban population in Maine are consistent with nationwide data, which consistently show that rural populations are more skeptical about climate change (Bonnie et al. 2020). Rural communities are often more vulnerable to climate-related events; however, studies have found that vulnerability does not

FIGURE 3: Responses to Statements about Climate Change



Note: Full questions, "To what extent do you agree or disagree with the following statements: climate change is happening [both surveys]; climate change is affecting fishing [angler survey]; climate change is affecting hunting [hunter survey]?" (angler n = 305; hunter n = 11725). The differences between rural and urban Mainers are significant at at least the five percent level across all four statements. The differences between anglers and hunters may be influenced by the fact that anglers were allowed to select a "neutral" option, thus only 14 percent of anglers *disagreed* that climate change was happening and that it was affecting fishing in Maine's lakes and rivers.

correlate with perceived risk, and that political orientation and world view are a more reliable predictor of climate attitudes (Safi et al. 2012). In our angler survey, rural Mainers were statistically more likely to report being conservative (two Likert scale questions, one regarding social and one fiscal, where 1 = very conservative and 7 = very liberal) than their urban counterparts, a trend that is well established in both state and national polling and election results (Pew 2024). Taken together, this indicates that climate skepticism among rural Maine anglers and hunters aligns with national trends where rural residents express more doubt about climate change. Yet it is important to note that our survey shows that an overwhelming majority of both urban and rural Mainers agree that climate change is happening and is affecting Maine. This finding aligns with recent research on rural voters, including work on rural Maine, which challenges media portrayals of polarized "rural rage" and instead demonstrates that rural residents often have nuanced, pragmatic attitudes about the social and environmental issues that impact their lives (Shea and Jacobs 2024).

Given evidence from our survey that climate change is a concern for all Maine hunters and anglers, we will explore opportunities to further understand and examine

these findings. The timing of the surveys (August 2024; March 2025) corresponded with recent occurrences of above-average temperatures that affected the 2024 ice fishing (NOAA 2024) and hunting seasons.⁷ We intend to survey hunters again in winter 2026 and will examine if the weather during the fall 2025 hunting season affects climate opinions among the rural Maine hunters. Our survey demonstrates that Maine outdoorspeople, with their deep connection to the land, recognize the changes they have seen over their many years of angling and hunting.

CONCLUSIONS AND NEXT STEPS

The results of these surveys show that hunting and fishing are a large part of Maine's culture and heritage and that the average hunter or angler has decades of outdoor experience. Most people fish and hunt for recreational purposes; however, these heritage activities also contribute to food security for some households.

Hunters in our survey were more likely to report hunting for consumption and were more likely to consume harvested meat than anglers. Our results indicate that the majority of Maine hunters—most of whom are rural residents—are likely to agree that hunting is important to their food security. This fact is especially relevant given that the share of hunters who are Maine residents has risen in recent years, which means that food-related impacts and advisories increasingly affect Maine households (the majority of which are rural) rather than visitors. Because different communities are affected by environmental contaminants in wild fish and game differently, efforts to reach communities underrepresented in our sample, such as Maine's tribal communities, should be prioritized in future research.

As Maine faces emerging contaminants like PFAS and a changing climate, it is important for sportspeople to have clear, reliable information about these changes. Our results show varying levels of awareness about environmental contaminants and consumption advisories, which suggest the need for continued education about the benefits and risks associated with consuming fish and wild meat. Recognizing the importance of trust and common ground in natural resource management, our

survey also documents that many hunters and anglers have a positive association with decision-makers who manage Maine's natural environment and the species living there. Further, our results suggest that Maine hunters and anglers share common ground in recognizing the existence and impacts of climate change. Future research should build on this shared heritage, knowledge, and trust to create targeted information that addresses different hunters and anglers based on where they hunt, fish, or live, their consumption habits, and their knowledge levels. These efforts may help ensure that all Mainers can make informed decisions about wild game consumption.

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NOTES

- 1 US Fish and Wildlife Service's "Fishing License, Holders and Costs by Apportionment Year" and "Hunting License, Holders and Costs by Apportionment Year" data are available to download from <https://partnerwithapayer.org/funding-sources/>
- 2 "Food Insecurity among the Overall Population in Maine," Feeding America, <https://map.feedingamerica.org/county/2023/overall/maine>
- 3 "Maine PFAS information," Maine Department of Environmental Protection, <https://www.maine.gov/dep/spills/topics/pfas/maine-pfas.html>
- 4 "Fish and Seafood," Maine Center for Disease Control & Prevention, <https://www.maine.gov/dhhs/mecdc/healthy-living/health-and-safety/food-safety/fish-and-seafood/>; "PFAS Do Not Eat Advisory," MDIFW, <https://www.maine.gov/ifw/hunting-trapping/hunting/laws-rules/pfas-related-consumption-advisory.html>
- 5 The survey included an embedded experiment to test the effectiveness of informational messages regarding PFAS contamination. The message experiment is not analyzed here.
- 6 It is important to distinguish between the response rate, the completion rate, and the final analytic sample. The response rate

refers to the proportion of individuals who began the survey out of those invited minus those who were noncontact (i.e., email did not reach the intended recipient). The completion rate captures the share of those respondents who finished the survey in its entirety. Finally, the cleaned dataset reflects the subset of completed surveys that met inclusion criteria and passed quality checks, such as removing duplicates, incomplete responses, and inconsistent answers. For the angler survey, 4,993 people started the survey for a response rate of 9.7 percent, although only 4,206 finished the survey and our final analytic sample is 3,549. For the hunter survey, 16,949 people started the survey, for a response rate of 10.1 percent, although only 15,237 finished the survey and our final analytic sample is 13,330.

By geocoding MDIFW licensing data using Census Geocoder service and spatially joining it to 2020 Census tabulation blocks (TIGER/Line tabblock20), we were able to classify some respondents as urban or rural residents using the blocks' UR20 indicator from the 2020 Census Urban Areas (<https://geocoding.geo.census.gov/geocoder/>; "TIGER/Line Shapefiles," US Census Bureau, <https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.html>). Urban-rural status was established only for the subset of respondents whose addresses could be geocoded and matched to 2020 Census blocks in Maine

- 7 "2024 Fall Seasonal Climate Summary," National Weather Service, <https://www.weather.gov/car/2024FallSeasonalSummary>

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