



# Maine Department of Marine Resources

## Nearshore Marine Resources Program

### 2023 Annual Review Summary Report

December 2, 2024  
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#### *Abstract*

The purpose of this report was to summarize the 2023 Annual Reviews to the historical coastwide level; and to examine sections of the report to the regional level that were interesting and considered useful to both municipal shellfish programs and the Department of Marine Resources (DMR). The Annual Review reports are one of the requirements of having a municipal shellfish program, but they also provide a platform for programs to evaluate their efforts during the year as well as to plan for future management goals and conservation activities. Analyzing and summarizing the information from these reports allows DMR to help determine if shellfish programs are meeting requirements and provides a better understanding of local effort. This report includes Annual Review submissions from 58 shellfish programs that include over 70 municipalities. The 58 shellfish programs are separated into three regions southern, central and eastern. Summarizing the information to the coastwide level provided interesting information but analyzing the Annual Review data down to the regional level provided an even greater insight into effort and highlighted geographical differences. Some of the more interesting regional information such as multispecies management and a summary of municipal shellfish license fees did not originate from the Annual Review report but rather from individual shellfish ordinances and the 2023 DMR annual license allocation approval letters. The process of reviewing and summarizing the data also indicated that updating the Annual Review documents would make the data collected more relevant and valuable to DMR and municipal shellfish programs.

#### *Introduction*

Local shellfish management and sustenance harvesting has a long history in Maine, in fact they predate Maine's Statehood and can be traced back to Native American cultures and English common law. Today Maine's intertidal shellfish resources are co-managed; this responsibility is shared between DMR and its municipalities. In 1963, Maine enacted legislation that authorized municipalities to enact shellfish ordinances, subject to the approval of the Commissioner of Marine Resources (DMR 2004). Municipalities that assume this management responsibility do so with the understanding that they must meet certain statutory and regularity requirements (DMR 2004).

The co-management system is a result of the Maine Legislature creating Statute (Title 12 M.R.S.A Chapter 623, Article 4 §6671), the DMR producing Regulation (Chapters 4 and 7), and

municipalities adopting ordinances. Statute authorizes the adoption of local shellfish ordinances and authorizes DMR to promulgate regulations. Regulations set the criteria and are enacted through a public process. Municipal shellfish ordinances establish guidelines for sustaining and managing their shellfish resources, ordinances are enacted through town meetings or council vote. One of the management responsibilities that comes with having a shellfish program is submitting the Annual Municipal Shellfish Management Plan Review (aka Annual Review).

The following criteria was copied from Chapter 7.30, paragraph 4 regarding the Annual Review reads: *“Submitting annually, on a Department approved form, by April 1<sup>st</sup>, a complete and accurate Municipal Shellfish Management Plan Review, to the Department including the following information: statement of management goals and implementation action, members of the shellfish committee or staff, shellfish committee meeting schedule, conservation credit information, summary of conservation closures/openings, summary of transplant activities, details on survey data, shellfish management activities undertaken, e.g. spat fall enhancement, predator controls, etc. and related expenses, number of shellfish harvest licenses sold, revenue from license sales and fines, funds raised or appropriated for shellfish management, and summaries of municipal wardens’ activities for municipally managed areas.”*

From 2018 – 2019 shellfish committees and outside partners held meetings in Downeast Maine centered around shellfish conservation and co-management (Petersen 2024). One theme that surfaced at those “meetings was a frustration with the town annual shellfish management review document” (Petersen 2024). This centered around the time and energy shellfish programs put into the report and feeling “that it wasn’t used by DMR” (Petersen 2024) in a meaningful way. Participants in a 2024 report by Chris Petersen “expressed interest in knowing what other towns are doing” (Petersen 2024), and they believed a summary of the content submitted in the Annual Reviews was one way to access that information and initiate communication between towns across the State.

## ***Methods***

This project was carried out utilizing the latest (2023) Annual Review reports submitted by the 58 municipal and regional shellfish programs. Once submitted, the reports first go through an internal review process by staff from the Nearshore Marine Resources Program (NSMRP) to deem the report final, incomplete, or deficient. If required information is absent, staff follow up with the submitting shellfish program and their representatives to collect or clarify language to complete the report.

Previously an Access database was developed and utilized to hold the Annual Review data and generate the coastwide summary report. That database became corrupt and was no longer available, for this project an Excel spreadsheet was created for data entry and analysis. Once the

spreadsheet was populated and quality control of the data completed, descriptive statistics were performed to analyze the required elements of the report as well as topics of interest such as conservation activities, license fees and multispecies management. The information on multispecies management was not captured in the 2023 Annual Review form, instead that information was sourced from the definition section of all 58 shellfish ordinances. Because this information was sourced from a definition, it was only used to summarize what species each shellfish program manages under their ordinance and not what species were being managed during conservation activities. The Annual Review form also does not collect license fees specifically but rather how licenses are allocated (limited or unlimited), the number issued and the revenue from those sales. The revenue and number of licenses issued cannot be used to determine fees as some shellfish programs reduce those fees based upon completed conservation time or other qualifications such as age. To supplement the allocation information collected in the Annual Reviews, license fees were brought into the Excel file from the 2023 Annual License Allocation approval letters.

Formally, the Annual Review summary report was analyzed and reported at the coastwide level. This summary report is presented at the coastwide and at the geographical or regional level. To assign DMR coverage of shellfish programs, the coast is divided into three separate regions: southern, central and eastern. The southern region begins at the Maine/New Hampshire border and runs to the Damariscotta River, the central region spans from the Damariscotta River to Gouldsboro and the eastern region runs from Gouldsboro to the Maine/Canadian border. The information analyzed to the regional level was largely based upon re-occurring interest and information requests received from shellfish programs. The topics summarized by region include conservation activities, the warden position, allocation data, budget disbursements, and multispecies management. Conservation activities were summarized to show how many programs participated in conservation and what those activities were, the percentage of programs that utilized those activities and regional differences. Regarding the warden position, activities were presented at the coastwide level, however, disbursements, key information and differences were reported at the regional level. The license allocation data included information on limited and unlimited sales, fees, numbers of commercial licenses issued, and revenues from issuance. The multispecies information was analyzed to the regional level to illustrate what species are being managed and what percentage of programs are working with a single or multiple species.

**Results**

**Annual Shellfish Management Review  
Summary Report for the period  
January 1 to December 31, 2023**

**Number of shellfish programs reviewed: 58**

Commercial Programs	50	Recreational Programs	8
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- A program was considered commercial if it allocated 1 or more commercial licenses in 2023
- The 58 programs reviewed included over 70 municipalities.
- There was one new recreational program added to the central region in 2024

Within municipal shellfish management there are individual programs, regional or interlocal programs and reciprocal agreements. Individual shellfish programs exist as single entities, regional programs consist of two or more municipalities working together under one ordinance and reciprocal programs are individual shellfish programs that recognize another municipalities shellfish license or the sharing of harvest rights. Examples of regional programs include the five town Georges River Regional Shellfish Program (GRRSP) and the seven town Frenchman Bay Regional Shellfish Program (FBRSP). Examples of reciprocal agreements exist between South Bristol and Bristol as well as Dee Isle and Stonington.

Most municipal shellfish management programs establish a shellfish committee consisting of shellfish harvesters, residents and town officials to oversee the program. While shellfish committees are not required by statute or regulation, they have proven to be an effective means of running a shellfish management program. Municipalities with shellfish committees generally hold regular meetings.

<b>Committee Meetings</b>	<b>Total</b>	<b>Average per Program</b>
Number of meetings held	321	6

### *Conservation*

Conservation time is generally defined as the hours licensed harvesters contribute to the municipal shellfish management program. Conservation time can include activities such as participating in surveys, seeding efforts, shoreline clean-up, and attending meetings. Though the Annual Review form is set up to collect information on conservation credits and conservation hours, conservation is not a requirement under State Statute or DMR Regulation. When a municipality or a group of municipalities enact a shellfish ordinance that allows them to establish qualifications, including the requirement for conservation time, the application process, and fees for the municipal shellfish licenses allocated. Even though Maine’s coastal municipalities and shellfish harvesters have a long history of voluntary involvement in shellfish management, shellfish committees often express that it’s extremely difficult to get volunteers to perform conservation activities unless the activities are part of the requirement for obtaining a municipal shellfish license. When this circumstance occurs and for an extended period, it is common for the shellfish program to respond by setting and incorporating mandatory conservation

requirements into their ordinance through a public process. The information below summarizes conservation efforts and activities coastwide and by region, it does not focus on whether those actions were required or voluntary.

Conservation Credits	Total	Average per Program
Number of hours completed	10,662	183
Number of participants	1,025	18

- “Conservation credits” includes required and volunteer efforts/hours.
- Conservation credits were given for: meeting attendance, committee/community service, educational activities, coastal clean-up, surveys, reseeding, brushing, predator control and other

To reach their management goals, shellfish programs have different management and conservation actions available such as: setting the number and types of licenses, establishing conservation areas, restricting amount, time or season of harvest, conducting surveys, seeding, predator protection and spatfall enhancement. The Annual Review collects information on the following conservation actions: closures, transplants (seeding), spatfall enhancement, predator reduction, surveys and additional activities.

Summary of Activities	Total	Programs Reporting	Percent of Programs
Conservation actions	308	44	76%

- Includes both commercial and recreational programs

Conservation activities by region and count

Region	Closure	Add. Activity	Survey	Predator	Spatfall	Transplant	Total
Southern	10	22	51	18	2	7	110
Central	35	18	4	18	6	3	84
Eastern	51	17	0	17	23	6	114
<b>Total</b>	96	57	55	53	31	16	308

- *Additional activities included:* green crab surveys, trash or shoreline cleanup, water quality sampling, participating in experiments, septic removal, floating quahog nursery, walkover surveys, education, community events, landowner appreciation, and boat launch repair.

- Predator reduction activities included: netting, predator removal (green crabs and moon snails) and goose depredation.
- Spatfall enhancement activities included: brushing, broodstock cages, recruitment boxes/domes, and burming. Brushing is the action of placing cut brush from softwood or hardwood trees on the flats to modify prevailing current flow and encourage settlement. Burming is the practice of turning or modifying the sediment surface to construct a temporary bank or hill to alter water flow and encourage settlement.
- Transplants: 16 events - 4 of those events utilized wild seed, the remaining 12 events utilized seed sourced from a DMR approved hatchery. One shellfish program in the southern region completed a transplant event with quahog seed, the remaining events coastwide utilized softshell clam seed. Almost half, 44%, employed netting or predator protection.

The table above displays the ranking of conservation activities in order of count, i.e. conservation closure, additional activity, surveys, etc. However, if you look at the top three activities by percent of programs that utilized each conservation activity, the order of that list changes. For example, based upon totals, closures (96), additional activities (57), and surveys (55) were the top three activities. Alternatively, based upon the percentage of programs that completed a conservation activity the ranking changes to additional activities (55%), predator removal or protection (50%), and surveys (34%).

Furthermore, since additional activities were the 2<sup>nd</sup> highest in count and the 1<sup>st</sup> highest in percentage of programs utilizing, maybe that action should be expanded to collect better info on those efforts. The top 4 reported additional activities were: experimental, shoreline clean up, walkover surveys, and educational/community service.

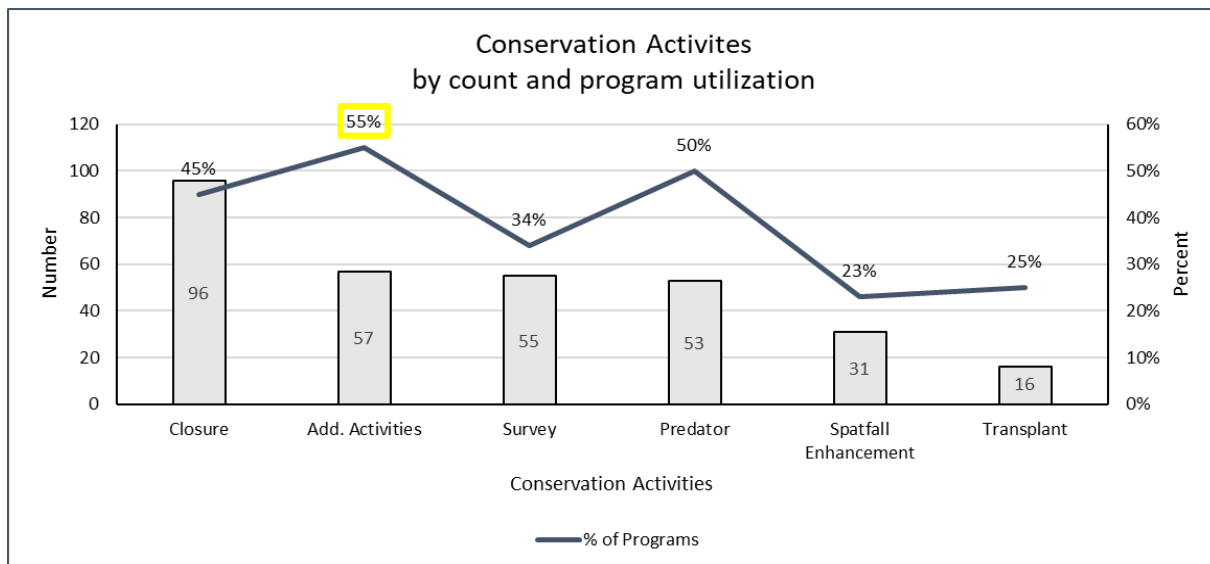


Figure 1. The counts and percentages are based upon the number of programs that participated in conservation activities (44) and not the total number of shellfish programs (58).

As with much of the Annual Review information, the coastwide data provided one picture while information organized at the regional level showed another. Using shellfish population surveys as an example, out of the 55 shellfish population surveys reported in 2023, 51 or 95% of those occurred in the southern region. An even closer look shows that three of the southern region programs completed 67% of those surveys. Another illustration, a total of 96 closures were reported in 2023 yet 53% of those occurred in the eastern region. The eastern region also led the way in spatfall enhancement activities, completing 74% of the events reported. The central region was focused on closures, predator reduction and additional activities.

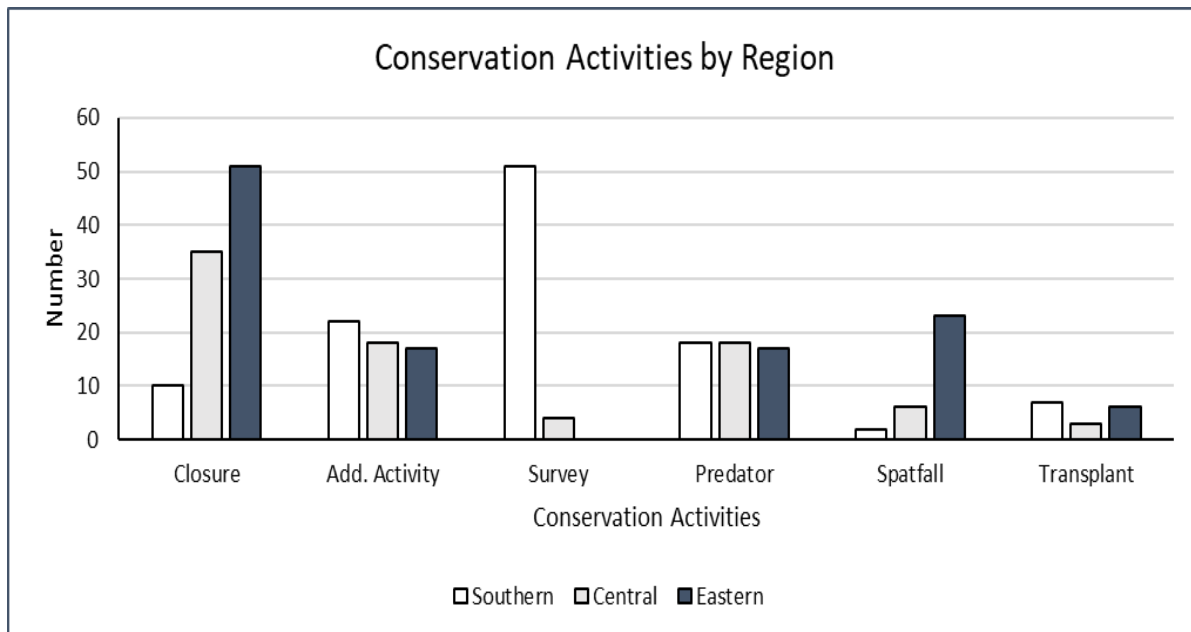


Figure 2. Number of conservation activities by region. Includes commercial and recreational programs.

### Warden Activities

Municipal shellfish programs are required to have enforcement. Many towns hire a dedicated shellfish warden, while others contract with existing law enforcement agencies like municipal police departments or the sheriff’s office.

Summary of Warden Activities	Total	Average per Program
Number of hours patrolled	25,091	433
Number of harvesters checked	7838	135
Number of Warnings issued	210	4
Number of court appearances	20	0.3
Number of Convictions	28	0.5

- Hours Patrolled: Minimum = 0, Maximum = 2,560 for an individual program.
- Zeros in reporting may be due to a position vacancy or the position could be tied to another municipal position such as Harbor Master or Police Officer and the hours of each role are not reported separately.
- Information includes all 58 programs

According to the municipal shellfish wardens who completed the warden activities section of the Annual Review, enforcement could be improved by:

<b>Enforcement could be improved by</b>	<b>Total</b>	<b>Percent</b>
More hours	21	33%
Additional staff	13	21%
Better equipment	9	14%
More and/or better training	8	13%
Greater state support	6	10%
Other	6	10%

### *License Allocation*

Municipal shellfish programs are authorized to create licensing categories and set licensing fees in statute. Slightly more than half of the shellfish programs choose to limit licensing, meaning there is a set number of licenses available annually in any given licensing category.

<b>Summary of Commercial allocations</b>	<b>Number of Programs</b>	<b>Percent of Programs</b>
Limited sales	26	52%
Unlimited sales	24	48%

- Based upon the 50 Programs that allocated at least 1 commercial license
- Unlimited sales provide harvesting opportunities for the maximum number of participants
- Limited sales maximize harvest by minimizing the number of participants

The table above is interesting as it shows an almost even split across the coast of limited and unlimited sales. However, if you organize this information by region, it's a very different result. Limited license sales are clearly the option of choice with the southern region programs whereas unlimited license sales were favored by the eastern region programs. Again, the central region programs seem to fall in the middle and paralleled the coastwide results.

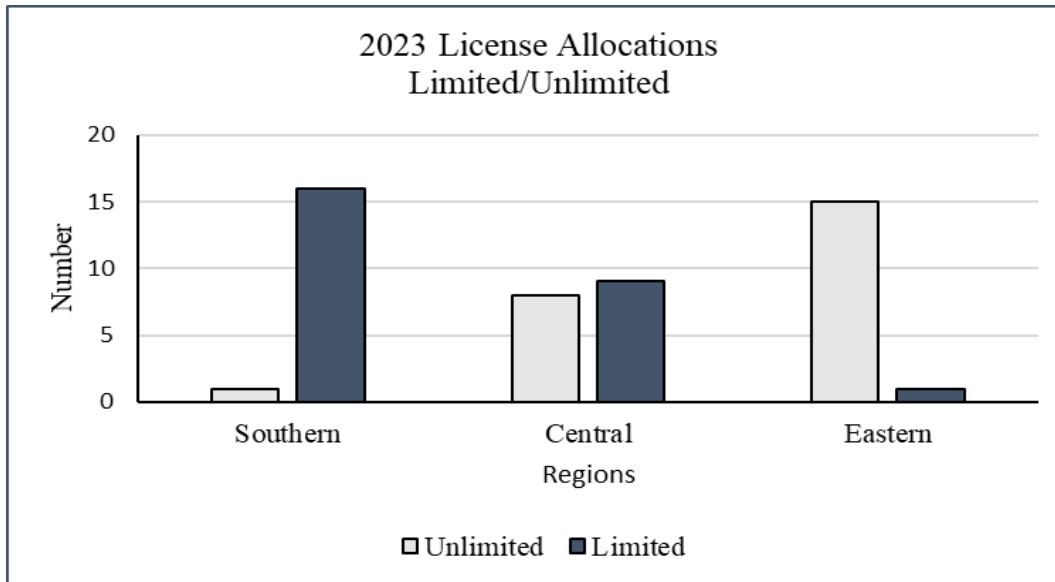


Figure 3: Commercial license sales structure by region.

*Shellfish License Allocation and Sales and Receipts*

Commercial	Subclass	Sold	Received
	Resident	1,010	\$272,900
	Nonresident	160	\$67,903
	Res. Senior	98	\$10,106
	NR Senior	19	\$5,078
	Res. Student	103	\$7,792
	NR Student	7	\$680
	Other	25	\$230
<b>Recreational</b>	Resident	2,409	\$37,105
	Nonresident	806	\$16,780
	Short term	1,198	\$18,455
<b>Total</b>		<b>5,835</b>	<b>\$437,029</b>

- Program average = \$7,535
- Examples of Commercial - Other licenses included bushel and senior 3-day licenses.
- Examples of Recreational - Short-term licenses included day, week or month licenses.

Resident and Nonresident commercial license fee summary

Commercial License Fees	Avg Fee	Min Fee	Max Fee	Median Fee
Resident	\$292	\$50	\$1,000	\$200
Nonresident	\$472	\$100	\$1,500	\$400

- The average, minimum, maximum, and median fees excluded senior and junior license fees.
- Programs with the minimum and maximum fees were both located in the Eastern Region.
- One program in the southern region offered the same fee for both residents and nonresidents.
- Two programs offered 5 or fewer commercial licenses to residents, following statute and regulation, those programs are not required to allocate non-resident commercial licenses.

Top 10 programs by number of commercial licenses issued

Program	Region	Resident	Nonresident	Total
1. Waldoboro	Central	134	17	151
2. GRRSP	Central	60	9	69
3. Machiasport	Eastern	61	7	68
4. Brunswick	Southern	57	6	63
5. Harpswell	Southern	49	6	55
6. FBRSP	Central	44	6	50
7. Cutler	Eastern	44	5	59
8. Lubec	Eastern	40	5	45
9. Freeport	Southern	37	7	44
10. Bremen	Central	34	4	38

- This information was based upon resident and non-resident commercial sales only, it excludes senior and junior sales. Junior and senior license sales totaled 227 coastwide.

Due to differences in license fees, the revenue from license sales did not follow the same ranking as the programs who issued the most licenses. For example, Harrington, Deer Isle and Friendship did not appear on the top 10 list for number of licenses sold but did appear on the top 10 list for revenue.

Top 10 programs by commercial license sale revenue

Program	Region	Resident	Nonresident	Total
1. FBRSO	Central	\$30,750	\$5,445	\$36,195
2. Brunswick	Southern	\$28,500	\$4,500	\$33,000
3. Waldoboro	Central	\$23,450	\$4,973	\$28,423
4. Machiasport	Eastern	\$20,950	\$5,600	\$26,550
5. GRRSP	Central	\$17,640	\$4,230	\$21,870
6. Harrington	Eastern	\$16,500	\$3,000	\$19,500
7. Harpswell	Southern	\$14,700	\$2,700	\$17,400
8. Deer Isle	Eastern	\$8,982	\$2,247	\$11,229
9. Friendship	Eastern	\$9,410	\$1,800	\$11,210
10. Bremen	Central	\$8,840	\$1,440	\$10,280

- License fees and final revenue did not always align. Mainly because some programs offered fee reductions or alter fees based upon conservation time completed or other qualifications.

*Budget Sheet*

Many shellfish ordinances try to fund their programs solely on revenue received from license fees and fines. This has led to higher license fees for many of those programs. For example, one program in the eastern region has a fee of \$1,000 for resident commercial licenses and \$1500 for non-resident commercial licenses. Fines do not seem to be a good source of revenue, at least in 2023. The Annual Reviews reported that only 8 programs received a total of \$2,580 in fine money. Other shellfish programs budgeted considerable resources in addition to license fees and fines. In 2023, one shellfish program disbursed over \$246,000 for enforcement and another spent \$12,000 on surveys. Across the coast municipalities spent over 1.2 million sustaining their shellfish programs compared to \$437,029 received from license sales.

There can be several expenses to budget for when starting or maintaining a shellfish program, among those are the warden position. The shellfish warden position is also another requirement of having a municipal shellfish program. They are often the only paid position dedicated to the shellfish program and frequently the main expense for most municipalities. Though the warden position is necessary it is also a key to a productive and effective shellfish program. The cost of the warden position can extend beyond the position's salary. The annual review collects information on other disbursements associated with supporting the warden position such as mileage, clothing, equipment and training. Statewide, in 2023 municipalities spent over \$954,000 on warden salaries and committed over \$1million total to support their warden

positions. Some reports indicated \$0 for the warden position, clear reasons for that included position vacancy or the shellfish warden position was linked to another local position, or contract that is paid for under a different account. Examples included Law Enforcement Officer and Harbor Master. In 2023, warden salaries averaged \$20,304 but ranged from \$500 to \$207,956. The program paying at the high end of this range was in the southern region and contracted with the local Sherriff's Office for two officers who provide full-time law enforcement coverage including enforcement of the shellfish ordinance. Position benefits can also add to the cost of the warden salary.

Other disbursement information collected on the budget sheet included advertising, supplies, surveys, purchasing hatchery seed, and miscellaneous. In all but two reports, there was no indication as to what miscellaneous expenses were disbursed for. This was interesting as miscellaneous disbursements totaled over \$64,000 and was by far the largest expense outside of the warden position. The highest amount reported under miscellaneous by one program was just over \$15,000. The two programs that provided more detailed information reported that the miscellaneous expense included a municipal vehicle and water sampling. Shellfish population surveys came in as the second highest expense at \$24,500. However, only three of the 58 programs reported disbursements for surveys and two of those programs paid 98% of that expense or \$12,000 each. All three of those programs were located within the southern region.

Total disbursements coastwide

<b>Disbursement</b>	<b>Program Total</b>	<b>Program Average</b>
Warden Salary	\$954,281	\$20,304
Mileage	\$78,361	\$3,265
Clothing	\$10,818	\$901
Equipment	\$30,374	\$1,898
Training	\$10,817	\$772
<b>Total</b>	<b>\$1,084,650</b>	<b>\$21,693</b>
Advertising	\$11,177	\$287
Supplies	\$13,407	\$583
Surveys	\$24,500	\$8,167
Seeding	\$19,776	\$2,825
Misc	\$64,197	\$2,469
<b>Total</b>	<b>\$133,056</b>	<b>\$2,772</b>
<b>Grand Total</b>	<b>\$1,217,707</b>	<b>\$20,995</b>

The chart below summarizes total disbursements by region as submitted in the Annual Reviews. It illustrates that the southern region's expenditures are higher than the other two regions combined. If distilled down to the top 10 programs for disbursements: 5 of those programs are in the southern region, 4 programs are in the central region and 1 program is in the eastern region.

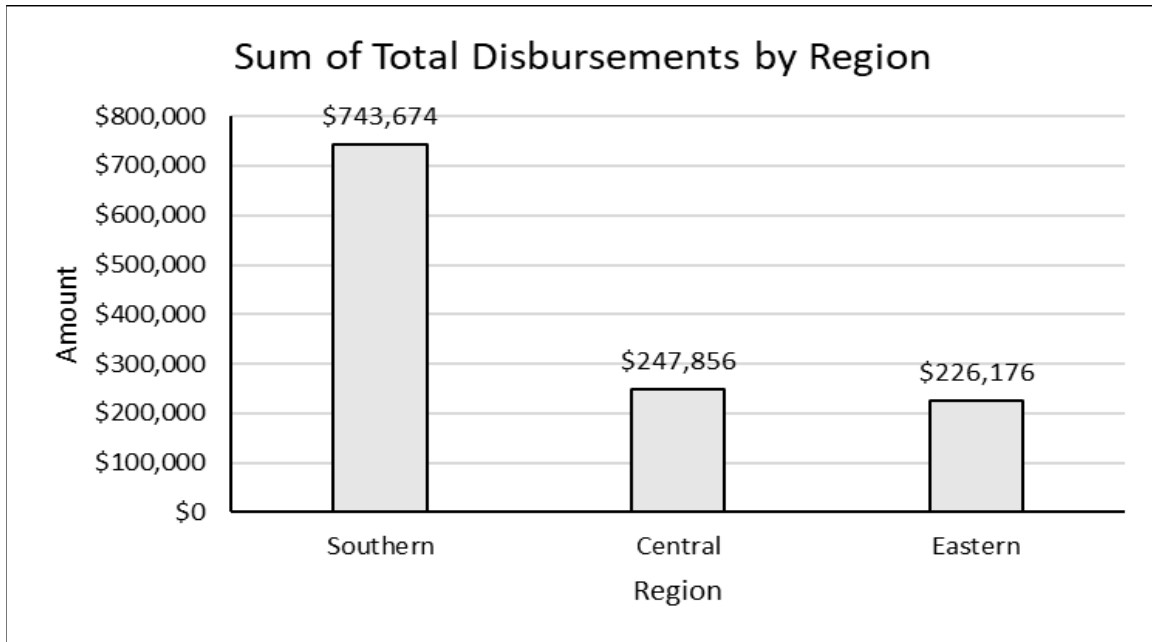


Figure 4: Total disbursements by region for all shellfish programs. This information includes all disbursements from the Annual Review budget sheet.

### *Multispecies Management*

A 2017 study by the University of Washington found that communities who were able to fish for several different species and had the ability to shift what they harvested, and when, were more resilient to unpredictable stock levels and market price (Cline et al. 2017). State law permits municipalities to assume management of shellfish stocks in addition to softshell clams such as: razors, surf, and quahog as well as American and European oysters. In 2023, the Annual Review did not collect species management data, the following information was collected from current shellfish ordinances. All 58 programs included softshell clams, 45% of them managed for softshell only.

### Multispecies management by species

Species	Number of programs	Percent
1. Softshell clam	58	100%
2. Quahog	27	47%
3. Razor clam	23	40%
4. Am. Oyster	19	33%
5. Surf clam	15	26%
6. E. Oyster	14	24%

- Information obtained from the definition of shellfish from each municipal shellfish ordinance

Organizing this data by region illustrated that all eastern region programs managed one species, softshell clam. Whereas the central and southern regions have both progressed into multispecies management. In the central region, 80% of the programs managed two or more species. Interestingly, the southern region bookends management, 32% or one third of their programs managed one species (softshell) and 27% managed for all 6 available shellfish species. The top three managed species in the central and southern regions were: softshell, quahog, and razor clam. American Oysters were right behind in fourth place in both the southern and central regions. American Oysters have been expanding their presence east across the central region and currently almost half of those programs now include American Oyster in their ordinances. Presently, American oysters are managed as far east as Sullivan; one of the 7 participating municipalities of the FBRSP.

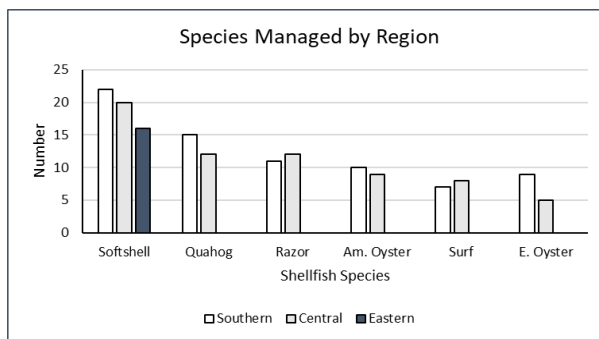


Figure 5: Species management by region

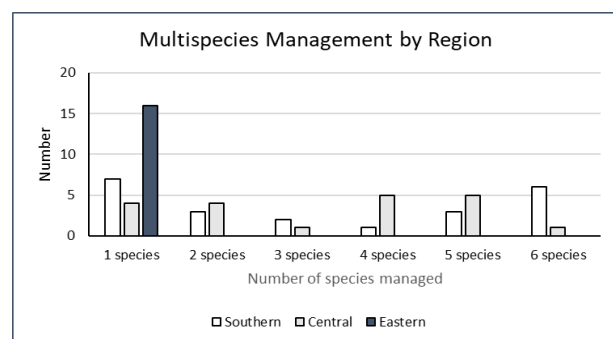


Figure 6: Number of species managed by region

### Discussion

The main goal of this project was to provide a 2023 Annual Review summary report. In addition, this exercise produced recommendations aimed at improving annual shellfish reporting, evaluating what information is or should be collected, and how to communicate that data in a

way that is useful to both DMR and municipal shellfish programs. By the end of the reporting process, it became clear that continuing to summarize the data purely at the coastwide level was no longer the most relevant or useful way to analyze and share the information; and there could be more value-added to the data collected through updating the Annual Review documents.

### Recommendation to adopt and incorporate regional level analysis

The previous coastwide Annual Review summary report was valued by shellfish programs and served as a podium for building municipal partnerships and increasing the capacity of information sharing. Although it was a comprehensive report, the data analysis only provided a broad view of the trends and efforts, failing to convey the regional and local diversity of shellfish programs. The following are a few examples from the results that highlight the diversity observed at the regional level. Coastwide in 2023, there were 96 conservation closures enacted, yet a regional breakdown finds that 53% of those occurred in the eastern region. A total of 55 shellfish population surveys were reported, however, 95% of those occurred in the southern region. The use of limited (52%) or unlimited (48%) license sales was evenly split at the coastwide level. Alternatively at the regional level, 94% of the southern region programs utilized limited sales while 94% of the eastern region programs utilized unlimited license sales. It was noted that regional assessments did not always deviate from the coastwide analysis. In the example of limited and unlimited license sales, the shellfish programs within the central region paralleled the coastwide analysis with an even division.

Traditionally municipal shellfish programs were started and designed to manage one shellfish species, softshell clam. However, during the past 20 years there has been a noticeable shift in shellfish resources leading to the incorporation of multispecies management. Today, all 58 shellfish programs are still managed for softshell clams, however 53% of those now also manage for two or more of the 6 included shellfish species. In addition, the regional information revealed that all shellfish programs in the eastern region still manage for softshell clam only and that American oysters have been included in municipal shellfish management as far east as Sullivan (FBRSP).

All shellfish programs may share the same requirements, but there still is no one-size fits all approach to shellfish management. Shellfish programs span the coast of Maine and communicate similar obstacles and needs including predation, pollution, access, and enforcement but as highlighted in this report there are also vast differences in their approach to conservation, resource management, budgets and municipal participation. A brief examination into the findings of regional level data produced interesting and constructive support for supplementing this report and future efforts with regional level analysis.

## Recommendation for modernizing the Annual Review documents

The following recommendation does not encompass a full assessment of how the Annual Review could be improved as that was not the main objective of this report. However, it does point out two areas that were modernizing the form could improve value: conservation activities and the budget sheet.

The data used to summarize multispecies management and commercial shellfish license fees did not originate from the Annual Review reports but rather were brought in from municipal shellfish ordinances and license allocation approval letters. Historically, there has been regular interest in commercial license fee data both at the State and local level. State statute explains how shellfish programs can set non-resident municipal shellfish license fees based upon their resident license fees but that is guidance, not data. Municipalities regularly ask for license fee data when starting a new shellfish program, assessing their current fees for budgeting purposes, or understanding how their fees compare to other programs locally and across the coast. The budget sheet collects information on license allocations to include sales and revenue but as currently designed it cannot be used to summarize license fee information. Revenues collected for license fees can be altered or reduced when conservation time or qualifications such as age are applied. License fee data is regularly requested by municipal shellfish programs and is of interest to DMR but since this data is already collected by DMR it would be redundant to also request it in the Annual Review.

The results from analyzing the conservation activities highlighted an activity titled: “additional activities”. It was observed that the additional activities category was one of the most utilized conservation measures, yet the details and efforts of those activities appeared under-reported. For certain activities like transplants, surveys and closures it may be easy to quantify effort through enumeration whereas the effort required to carry out water quality investigations, hydrographic studies, predator protection, access issues and participation in experiments can span days, weeks, or months. This suggests that reporting effort by count alone may not be the best method to track and report on certain activities. The title of additional activities also seemed a bit vague for one of the highest reported actions of 2023. Furthermore, it was noted that some of the activities such as recruitment boxes and green crab surveys could also apply to other sections of the report such as spatfall enhancement or predator protection. If the heavy utilization of additional activities continues it would be beneficial to revisit this section and review for improvements. Information on other conservation measures regularly employed or growing in interest such as size limits, harvest limits and limited purpose aquaculture may be of value but are not collected in a useful way. Additionally, it was not understood how the Proposed Management activities section located at the end of the Annual Review provides beneficial data contributing to shellfish management, the effectiveness of this section should be

reviewed. Perhaps it could be to be expanded to include an annual assessment from shellfish programs to identify problems, needs and partnership preferences.

Existing reports referenced for this project suggested that shellfish programs may not submit all the information regarding their efforts into their Annual Review reports. This was supported by NSMRP staff during the review process, one example included the 2023 budget sheet which required regular follow-up by NSMRP staff. Reasons cited for follow-up by staff included incorrect information, blanks or insufficient information, time and resources committed by the town to complete the sheet, and confusion on the instructions. Though the Annual Review is set up to collect data based upon the calendar year the budget sheet can cause confusion as municipalities and Town Clerks work with multiple timeframes, all of which are different. The other timeframes referenced included licensing and budget year. It was observed that some reports indicated \$0 disbursements associated with the warden salary. Follow up indicated that when the shellfish warden positions were combined with other positions such as harbor master or Law Enforcement officer it became problematic to separate and report on disbursements specific to shellfish enforcement. Furthermore, when this occurred, funds were often disbursed from other dedicated accounts to pay for the combined position or contract. It was interesting to observe that miscellaneous disbursements were the largest expense outside of the warden position yet only two reports provided minor details of what those expenses included. However, the budget sheet is only set up to collect financial information and not details of those disbursements.

In conclusion, Maine is fortunate to have a shellfish co-management structure but as with any complex relationship there is always room for improvement. Communication and partnerships are important to the success of a municipal shellfish program. These aspects are integral in increasing information sharing, providing technical assistance and equalizing the responsibilities of a shellfish program. Improving the value of the Annual Review and sharing that information not only helps DMR in its mission but also helps local shellfish programs respond to problems, advance development of adaptive techniques and cultivate partnerships.

### *References*

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