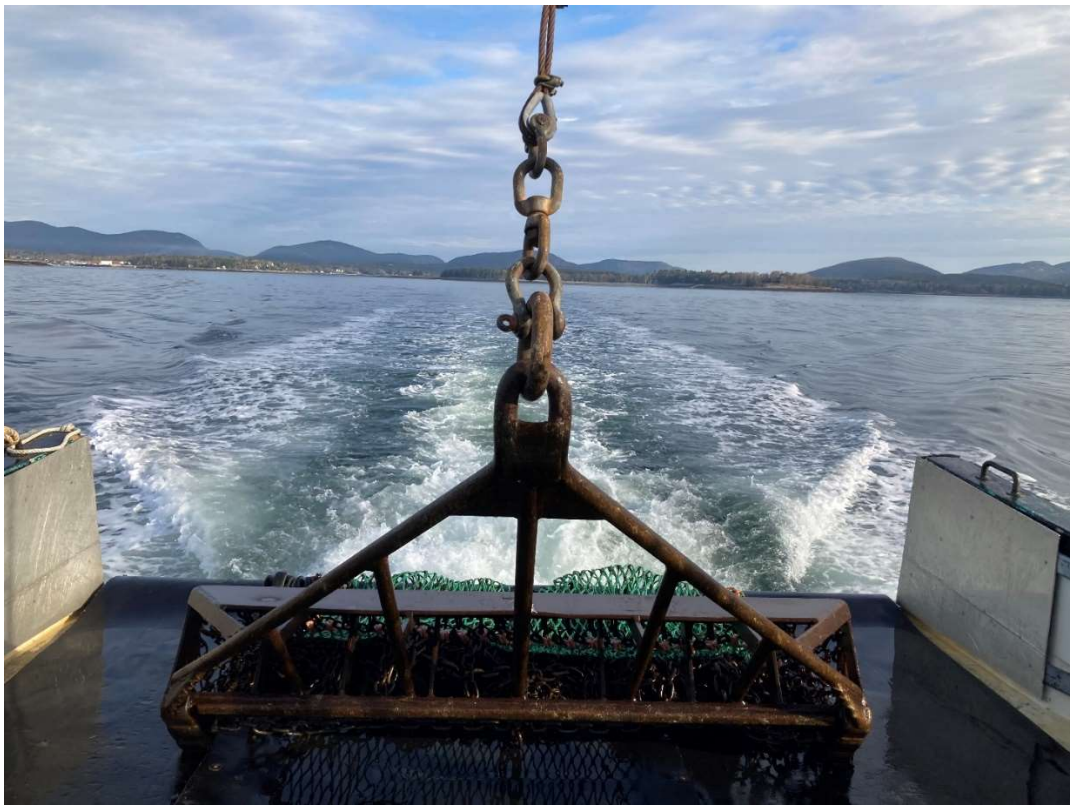
Annual State Scallop Survey Protocol

Maine Department of Marine Resources

Compiled Winter 2023

Updated 9/25/24



Overview

The Maine Department of Marine Resources has conducted an annual dredge survey each spring of the zone two rotational areas expected to be open for harvest the following scallop fishing season. Since 2016 this survey has been relatively consistent, with minor change detailed later. Each fall Cobscook Bay has been surveyed prior to the start of the fishing season in order to assess the relative abundance and population dynamics of Atlantic sea scallops in order to better manage the fishery. A subset of stations in areas of specific interest for the given fishing year are revisited during the fishing season.

The intent of these surveys is to provide managers with fishery-independent data on population size, recruitment, and meat quality that allows for interpretation of both year-to-year and in-season fluctuations of resource abundance. These surveys, along with in-season interviews conducted with fishermen, enables managers at the DMR to make better informed decisions with regards to area and season closures under the current management plan.

Major changes 2023

- Defining valid tow parameter ranges
  - 1-5 Min – Resample if too short or long.
  - 1-5 knots – Okay if outside of the range for a couple seconds
- Start of a scallop meat quality and disease protocol during SHMW
- Have Garmin GPS continuously recording GPS position during the trip
- Volume and count for all fish & lobsters
- Tunicate group level: Records tunicates by type
- The survey strata were updated for 2023
- If >50 clappers are caught you can subsample 50

Major changes 2024

Re-stratification:

High Density: Use Z-score from landed pounds for the past 6 years and survey data >0.1 scal/m2 since 2016 for high density grids.

Low Density: All low- and high-density grids that do not meet the 2024 high density criteria.

Survey domain: New domain based upon the fishing footprint developed 58 survey areas. These survey areas can still be grouped into the management boundaries defining the current domain.

Allocation: The minimum stations required for minimal variance were estimated for each area. Then allocation was determined for each survey area considering importance to the fleet mostly determined by total landed pounds, and survey logistics. Additionally, the total allocation for the rotational management area was not to drop below the minimum sample size per area.

Objective: Improve our understanding of scallop densities and size distribution priority areas for the Maine scallop fishery.

Survey Goals:

1. Estimate density and describe the scallop populations for the upcoming season.
2. Monitor historic scallop beds or potential scallop habitat with low fishing pressure.
3. Evaluate density and size structure of scallops in priority areas on an annual basis.

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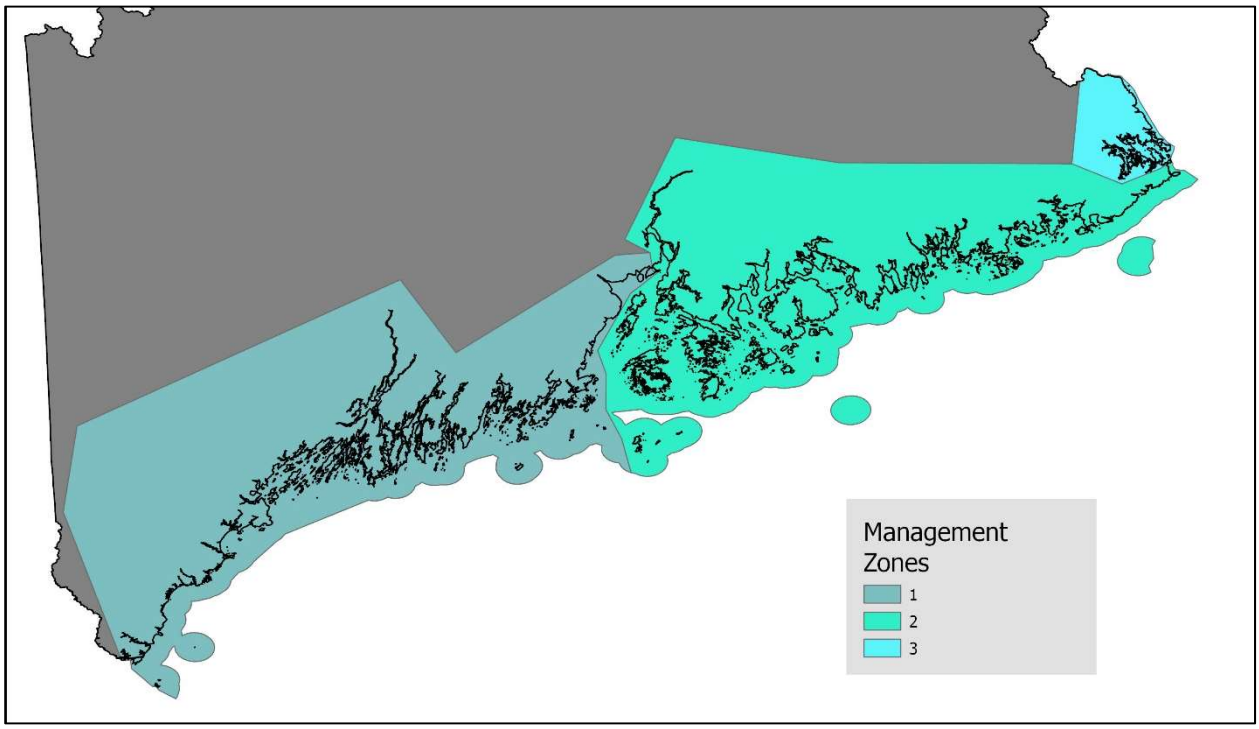
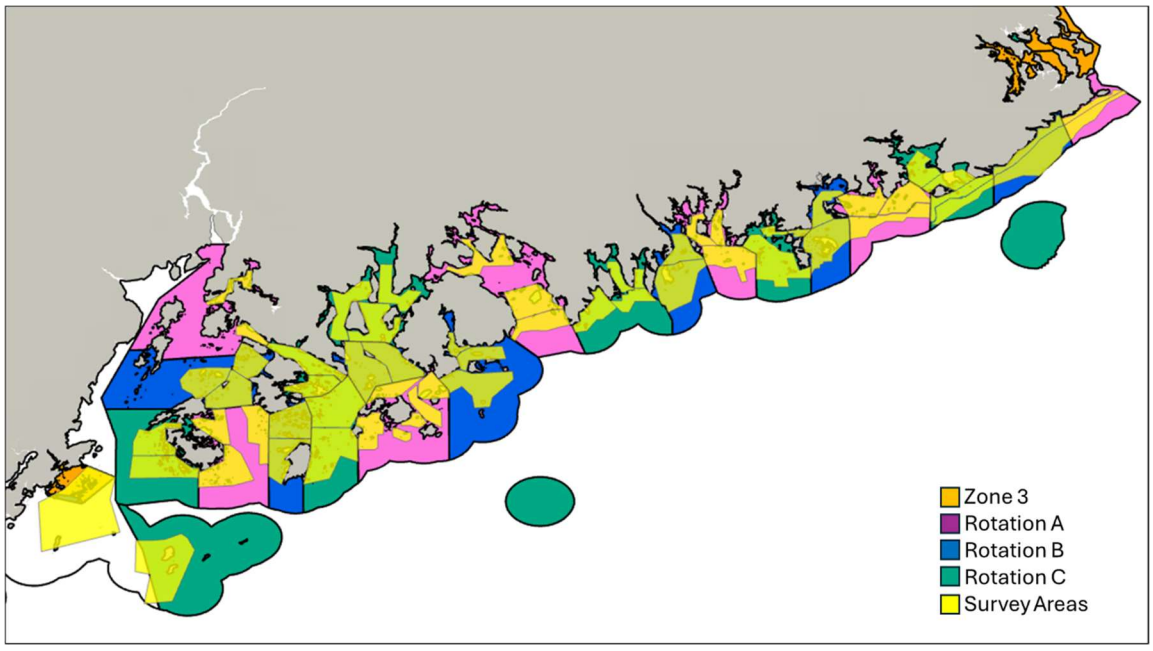
Map of SOM Scallop Management Zones



Map of Zone 2 Annual Rotational Areas overlaid with the survey domain.



Packing Lists

Protocol Binder – Make sure to print all the following documents

- ☐ **Special license –** Enough (laminated) copies to leave one with the captain and one in the computer case.
- ☐ **3 sets of paper copies of maps and station locations –** Bring for redundancy, one set for the captain to mark and the other for samplers to mark. Marks will be pre-loaded into Cap'n on the seas sampling computer as well.
- ☐ **Signed Invoice for the vessel**

Pelican Case 1

- ☐ **Zebra-Tech measuring board (at least 2) –** Used to measure and record scallop/clapper shell height. Also used to record scallop shell width and depth for meat weights. Bring a second board for redundancy.
- ☐ **Measuring board oil, manual, and hex keys –** Used for on-board maintenance and repair. The oil is used daily after cleaning the board. The hex keys can be used to open the button compartment on the moveable jaw if the buttons become unresponsive (batteries can be disconnected by excessive jostling).
- ☐ **Zip ties-** Used to secure measuring board, as necessary, and attach Ziploc over buttons.

Pelican Case 2

- ☐ **Navigation laptop, charger, GPS, and Cap'n navigation software instructions –** Used to navigate to tow stations. Stored in an orange Pelican case.
- ☐ **Mouse**
- ☐ **Flash drive with station data**
- ☐ **iPads (2+) –** Used to record trip, tow and catch data. Bring multiple for redundancy. ***Remember to put all tablets in airplane mode with Bluetooth off during sampling.***
- ☐ **USB charging cables –** For tablets, battery packs, Bluetooth GPS, and measuring board.
- ☐ **USB wall chargers and/or docking station –** To plug in USB charging cables.
- ☐ **Timer (2) and extra watch batteries –** Used to time tows. Bring a second timer and extra batteries for redundancy.
- ☐ **Handheld GPS-**
- ☐ **Battery packs (1) –** Used to charge the tablets during the survey as needed (batteries are draining quickly because of cold weather, tablets were not put in airplane mode, etc).
- ☐ **Batteries (4 AAA for the Timers, 6 AA for the GPS)**
- ☐ **Pens & Pencils**
- ☐ **Protocols**

Pelican Case 3

- ☐ **Waterproof deck logs, notebooks (2+) –** Used to record scallop and clapper counts, scallop weight and volume, and bycatch volume for each tow.
- ☐ **Tablet**
- ☐ **Sharpies (5)**
- ☐ **Pens (5)**
- ☐ **Ziploc bags ~30** Quart size, used to cover measuring board buttons to prevent fouling/sticking.
- ☐ **Gallon Ziplcok bags ~10**
- ☐ **Power strip**
- ☐ **Deck Knife**
- ☐ **Electrical tape**
- ☐ **Shop towels**
- ☐ **Hand Warmers**
- ☐ **Extra gloves & Glove Liners**

SHMW Supplies

- ☐ **Coolers and ice packs –** Used to keep the meats cool for the duration of the survey.
- ☐ **Plastic 24-compartment trays (8) –** Used to collect scallop meats in the same order that shell dimensions are measured. Also be sure to bring the bag with extra dividers.
- ☐ **Waterproof tags –** Used to label the compartment trays with the corresponding tow ID.
- ☐ **Meat Quality Markers –** At least 60 bingo chips to be placed with poor quality scallops
- ☐ **Water-** Tow was scallop measuring boards

Back Up Case- This can stay in the hotel

- ☐ **Gallon Ziplcok bags ~10**
- ☐ **Extra shop towels**
- ☐ **Digital scales –** Used to weigh scallop meats. *This can stay in the vehicle or hotel*

Additional Gear

- ☐ **Fish baskets (5) –** Used to estimate scallop volumes (~42 liters flush) and hang on scale for weight. Keep track of DMR baskets on the boats so they aren't swapped/left behind.
- ☐ **10-liter graduated bucket OR 1-liter cup –** Used to estimate volume of bycatch as necessary.
- ☐ **Rings, links, twine, shackles, and needle –** Used to repair drag on deck as necessary (8 links/ring, 5-6 rings).
- ☐ **Survival suits and PFDs for all personnel –** Remember about contractors, rotating crew, etc.
- ☐ **Hanging scale with hooks and a backup –** Used to hang baskets for scallop weight.
- ☐ **Cleaning supplies –**
- ☐ **Misc. supplies –** Tupperware and Ziplocs bags (gallon and quart size) for cleaning and storage.
- ☐ **Calipers**

Personal Gear

- ☐ **Deck Gear** - Life jacket, knife, Oil gear, boots, extra gloves
- ☐ **Medication**
- ☐ **Food**
- ☐ **Water**
- ☐ **Survival Suit**

Survey Lead Pre-Survey Prep

1. At least 3 months ahead of the spring survey ensure the RFP is valid
    a. If not begin the process for the RFP
2. At least 30 days ahead of the survey, submit
    a. The vessel Contract
    b. The PJF (procurement justification form)
3. Ensure all staff have the appropriate training and certifications.
4. Deliver the DMR drag to each captain with enough time for them to put the drag on the vessel and ensure that it is in good condition before the survey. Drag status and location is recorded at: Scallop\SurveySamplingear\scallop_survey_drags_wear_and_location
5. Load tow station marks into Cap'n navigation software and check that it is receiving GPS input. Instructions can be found in the laptop Pelican case appendix B
6. Inform local MPO of our survey date, boat, captain, and crew at least 24 hours prior to survey.
7. Print invoice for that survey/captain.
8. Charge tablets, battery packs, and measuring boards.
9. Gather gear from list.
10. Contact Motels
11. Contact marinas

At-Sea Set Up

1. Label the deck notebook with type of survey (spring, pre-season, in-season), date, day of survey (if multiple days), and location
2. Notify the shore contact you have departed and the estimated return time
3. Ensure the captain has a copy of the special license
4. Plug in extra tablets/battery packs to charge so they are ready if needed
5. Turn On Garmin GPS: Go to Settings/Tracks Set Method to Auto, Interval to Most often
    a. Navigate to track manager- If there is a track that has already been offloaded you can clear the current track then view current track on map. Leave the GPS recording all day, keep checking to make sure the battery is alive.
6. Set up Ipads
    a. Power on and open iForms. Login to the account SSP1 with the password Scallop1!
    b. Tap the 'Scallop Survey Tip' icon to open that project (it should be the only one)
    c. Tap the white plus sign (+) in the top-right corner to create a new trip
    d. Leave 'Assign this Trip back to:' blank but fill in all other fields in the trip subform
    e. Be sure to update the 'Cruise' field with the appropriate survey type and year (e.g. CRFL19 for the fall/pre-season cruise in 2019)
    f. Ensure that Wi-Fi and GPS are disabled from the settings, not quick view, so the battery doesn't die quickly
7. Set up scallop measuring boards
    a. Erase all data on measuring board from previous survey -Make sure it was saved before!
    b. Press A and B buttons simultaneously to enter the menu system
    c. Press B to advance through menu options until the screens displays the option 'clear storage'
    d. Press A to select this option and confirm your choice
    e. Secure the board to a surface with cable ties, twine, or paracord
        i. Usually, we use a tote
    f. Cut off the open end of a Ziploc bag and secure it over the measuring board buttons with cable ties
8. Set up computer with captain software
    a. Plug in the GPS to the USB
    b. Open CAPN under options click Find GPS data
    c. Ensure the marks are loaded and visible
    d. More details are in Appendix B
9. Load marks on the captain's computer as well
    a. More details are in Appendix B
10. Set up the hanging scale- tare to and empty bushel basket

At-Sea Sampling

Instruct the captain that the tows should be in a straight line, when possible, for as close to 2.5 min as possible. If we hang down or there is gear conflict it is okay to haul back early. We want to keep the tows as standardized as possible but also ensure we're catching scallops.

Tow Parameters:

Speed- 3.5 knots, If the speed remains above 5 knots or drops below 1 knot for too long the tow should end and if outside the time range the station should be resampled

Tow Time: 2.5 min (acceptable range 1-5 min)

Scope: Dependent on the vessel, the captain should be fishing the dredge for maximum catchability

When the captain is ready to begin sampling stand by with the tablet to record the data, these tows happen fast.

- Tap 'Effort data subform', tap plus sign for a new tow, and fill in Tow Station and Stratum as it appears in Cap'n
- Label the tow number and station ID in the notebook.
    a. Check the field comp AND paper sheet to ensure you are at the correct station.
- **Capture dredge-in position** when the boat is lined up and the wire begins going out.
- **Capture tow start position** when the wire brake is set and the drag hits bottom.
    a. Check that the GPS is getting signal by tapping refresh a few times to make sure the lat/lon and timestamp change slightly before tapping done to record that position. If it doesn't, just back out and go back in. If it really isn't working you may have to grab the other iPad and restart the tow or go off the Captain's GPS as a last resort.
- Drag for 2.5 minutes for in-state surveys
- While dragging, enter the other effort data (bottom type, wire out, etc.) listed in the subform. Ask the captain as necessary to get this information.
- **Capture haulback position** as it occurs.
    a. Tow start and haul back are extremely important to capture on time. Make a comment if either are collected late, as that will enable tow length to be estimated later. If either field is left blank, it will not upload.
    b. Check that the tow length (calculated from tow start and haulback) seems reasonable.
- Look at the dredge as it is coming aboard, ensure the gear appeared to fish normally, no shiny rings on the top, or something obstructing the mouth of the dredge for example.
    a. Estimate the total volume in the dredge by counting how high the catch is in number of rings from the clubstick (or count down from the sweep and convert), write this in the note book
- After the drag has been completely emptied on deck, tap 'haul photos subform' and take a clear picture of the pile

Sorting the catch (All Hands):

Work together with the crew members to sort the catch. It usually works best to have 2 people count scallops into the bushel basket, one person to focus on getting all the clappers and sea cucumbers counted and making sure the recorder sees all the bycatch. The recorder should help sort the catch at the beginning to make sure that they get a close look at the catch, making particular notes on the substrate type and the presence of seed scallops.

Pre-season survey

a. Count scallops into bushel baskets
    i. Scallops <~30 mm should be placed in a separate small bucket so they don't get lost during the rest of the processing, but when measuring be sure they are included in the appropriate proportion of the remaining scallops for the measured subsample.
b. Clappers get counted into bushel baskets (its often easiest to toss them out of the pile and have one person count them into a basket)
c. Sea cucumbers (Pickles) get counted into a bushel basket
d. Record counts of scallops, clappers and cucumbers from each pile picker
e. Record the weight (0.5 kg) and volume of the scallops and sea cucumbers
    i. Estimate volume (0.5 L) of each scallop basket, a full basket is ~42 liters
f. Count and estimate the volume for all fish by species, given the expected selectivity of the gear and the ability to see the smaller fish in the catch fish <3 cm are not expected to be counted or included in the volume estimate.
    i. If the species is unknown, it is okay to group together into group ie Herring sp.
g. Record the count, volume (0.5 L), carapace length, and sex of lobsters
h. Estimate the volume (0.5 L) of all remaining catch (including shells, and substrate), group into species level if possible (see page 16) and record in notebook, basket = 42 liters, Tote = 75 liters
    i. Only record species with a catch >0.5 L
    ii. Sensile benthic organisms still attached to substrate, (ie encrusting algae anemones, tunicates) don't get recorded unless it is a substantial portion of the catch

- Before clearing the deck ensure all the data is collected, confirm the substrate type recorded matches the observations on deck, and that enough scallops are saved for measurements and if needed SHMW (at least 1.5

In-season survey

a. Count scallops into bushel baskets
    i. Scallops <~30 mm should be placed in a separate small bucket so they don't get lost during the rest of the processing, but when measuring be sure they are included in the appropriate proportion of the remaining scallops for the measured subsample.
b. Clappers get counted into bushel baskets (its often easiest to toss them out of the pile and have one person count them into a basket)
c. Record counts of scallops and clappers from each pile picker
d. Record the weight (0.5 kg) and volume of the scallops
    ii. Estimate volume (0.5 L) of each scallop basket, a full basket is ~42 liters
e. Estimate the volume (0.5 L) of most prevalent remaining catch (eg 200 L of rock), basket = 42 liters, Tote = 75 liters
    iii. Record volumes as 0-50, 50-100, 100-200, 200-300 etc

- Before clearing the deck ensure all the data is collected, confirm the substrate type recorded matches the observations on deck, and that enough scallops are saved for measurements and if needed SHMW (at least 1.5

Measuring Scallops

If a scallop is over 180 mm or under 20 mm take a photo of it to prove its size or make a note in the notebook. Otherwise, it will be deleted as an outlier.

1. Set station number on measuring board
    a. Enter the measuring board menu system and advance to the option 'set station number'
        i. Always have the board fully open or fully shut when entering the menu in case a measurement is accidentally taken
    b. Move the jaw until it is in position for 1 for the first tow, etc.
    c. Press A to select and move to the next digit (e.g. tow 10) or B to save as single digit (e.g. tow 1)
2. Tare measuring board once plastic bag is zip-tied over the button handle
3. Press A to record shell height for scallops and B to record shell height for clappers
4. Always measures clappers after all scallops have been measured – this makes data QC described below much easier and makes it possible to determine if the wrong button was pressed by mistake
5. Measure shell height of 100 randomly selected scallops or 10% of the total count
    a. Only 50 randomly selected clappers need to be measured from each station.

Note – You may need to tare the scallop board occasionally, which is a menu option. You definitely will if you put a new bag on the handle. More details on the scallop measuring boards are in the appendix A.

Shell Height Meat Weight Collections:**Meat weights not collected during in-season surveys.**

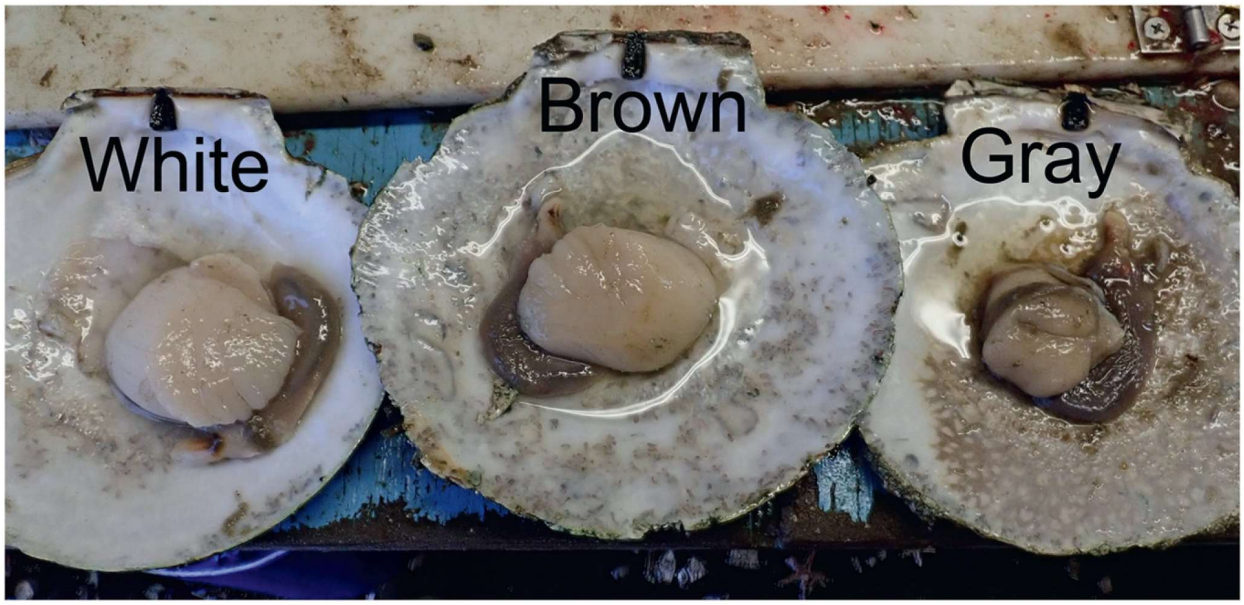
Every fourth tow 24 scallops are subsampled for shell measurements and shucked for meat weights. If there are not enough scallops present on the selected tow save all the scallops and if the following tow has >24 use the scallops from that tow, otherwise aggregate the tows together, but ensure that the data is recorded for the correct station.

b. Select 24 scallops (save some extra in case of clappers) which represent the size range of that station >60mm
    i. Note these scallops are part of the 100 selected for length measurements

a. Put the measuring board in 'multi-mode' by entering the menu, advancing to config, then selecting measuring mode, advancing to multi-mode and selecting it
b. Measure shell height by pressing A, then shell width by pressing B, and depth by pressing B again for three total measurements (see Appendix A)
    i. If there is biofouling on the shell effecting the measurements, remove the biofouling before measuring
c. Have a fleet member carefully shuck the scallops in the same order that they are measured and place meats in that same order from left-to-right and top-to-bottom in the 24-compartment plastic trays
    i. ensure all the pieces of the abductor muscle is removed from the shell and placed in the container
    ii. Check meat quality (scale bellow), if the quality is fair place a yellow marker in the container with the meat, if the quality is poor place a red marker with the meat
    iii. Examine for orange nodules, nematodes, or other obvious parasites/signs of disease if present note in notebook.
    iv. Try not to get too ahead with measurements in case a scallop is cut open and turns out to be a clapper
    v. If this does happen, you can either delete the measurement record (if it isn't too far back) or place a note in the meat weight tray where it would have occurred, so we know later to disregard that measurement
d. Write a label on the waterproof tags (on both sides of tags) with the tow number and station name and place it in the compartment with meats
    i. Store the meats in the cooler while at sea

Scallop Quality Scale

Quality	Good	Fair	Poor
Color	White/Orange	Brown	Gray
Textrue	Firm	Starting to become soft/squishy	Soft and flacid muscle degraded
Relative Size	Normal	Small compared to shell	Sunken and often difficult to seperate from other tissues



Reference photos: Investigating the Impact of Multiple Factors on Gray Meats in Atlantic Sea Scallops (Placopecten magellanicus) *Liese A. Siemann, Luisa M. Garcia, Carl J. Huntsberger, Ronald J. Smolowitz*

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Developed by Commercial Fisheries Research Foundation with funding from NOAA project 21-SCA-10

Meat Quality Guide

Normal, white scallop coloration, firm texture. Scallops with orange meats if firm should be in this category too.

Muscle starting to degrade, slight brown discoloration, slightly smaller than expected, noticeable change in texture, softer

Gray meat, muscle is soft and flaccid, and degraded. The meat is shrunken and often difficult to separate from other tissues.

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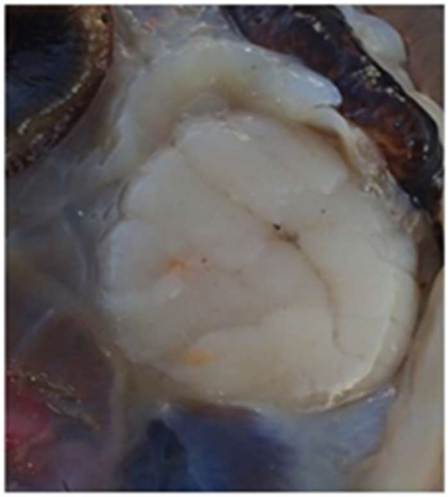
Bacterial Infections

Yellowish orange bubble in the meat filled



Nematode infection

Brown Orange- Pin hole

Shell Blister

Pocket against the shell

Entering Data/End of the day Saving data & QA/QC

Enter catch data

1. Tap 'catch data subform', select scallops from 'species quick pick' and enter the quantity, volume, and weight. Tap plus sign (+) to repeat for clapper count. Repeat for bycatch volume.
    a. Always enter scallops as Catch ID 1 and clappers as Catch ID 2, even if the count is zero
    b. When finished, tap 'back' symbol to return to effort subform and tap 'done.' Tap 'save' if you were unable to enter all of the bycatch before the next tow.
2. Sample data subform is used for more data on one catch level i.e. lobsters)

Save the scallop data from the measuring boards

1. Enter measuring board menu system and advance to 'Enable Bluetooth'
2. Open ZebraTech app on the tablet and connect to the measuring board
3. Tap the button to collect data and then open the newest file (check the date to make sure you're looking at the correct file)
4. Keep the measurements on the scallop board until the next morning when you're certain the measurements have been backed up.
5. Scrub the measuring board with sea water only, rinse thoroughly with freshwater, dry well, and oil the board at the end of the day

QC/QC if time permits

1. Count the number of scallops (indicated by A button-pushes in the spreadsheet) and clappers (indicated by B button-pushes) for each tow and compare to the counts listed in the iForm and notebook.
2. The counts should be the same except when > 100 individuals counted
3. Note any discrepancies in the notebook with e.g. an asterisk (i.e. *)
4. When finished checking all tows, reopen the iForm app on the tablet and correct the scallop and/or clapper counts in each tow indicated in the notebook
5. The goal here is to have agreement between the measuring board data and the iForm data for scallop and clapper quantities (except when subsampling and then the reported quantity can be greater than the number measured on the board)
6. While doing that, check that all information from each tow is complete and makes sense (e.g. tow length). Also check that catch information was entered properly (Spring and Cobscook pre-season surveys) and that each sample has a unique catch identifier (1+).

End of the Day on Land

When you return to civilization, connect to Wi-Fi, open the ZebraTech app on the tablet, select the correct file and tap on 'send'.

1. Email the file to yourself from the DMR Gmail account that is on the tablet
    a. Username: mainedmr.rde
    b. PW: Lobster1!
2. Open the .csv file on your laptop and create new columns titled 'MeatWt', 'MeatQual', 'MeatComments'. These column needs to be named exactly, even on days when meat weights are not measured, so that Access interprets it correctly when using the uploader.
3. Check that all station numbers are correct and that all scallops are measured as "A" and all clappers are measured as "B".

Meat Weights

1. Create a copy of the raw data from the measuring boards with a new field for meat weight
2. For each tow, weigh (0.1g) and record meats in the order they were cut/measured on board and record the meat weight in the .csv file
3. Ensure the scale is tared correctly
4. Save the .csv on the network

GPS Off load

- On a computer that has the Garmin Basecamp program
- Connect the GPS to the USB
- Open basecamp
    - Using the device tab select receive from device
- Select the data you want to save as csv in the library
- Go to file Export, change the filetype to CSV
- Clear the log from the GPS

Beaufort Sea State Scale

Beaufort Number	Wind Description	Wind Speed (kts)	Wave Height (m)	Sea Condition
0	Calm	<1	0	Sea like a mirror.
1	Light Air	1-3	0.1	Ripples only.
2	Light Breeze	4-6	0.2 - 0.3	Small wavelets, crests appear glassy.
3	Gentle Breeze	7-10	0.6 - 1	Large wavelets, crests begin to break.
4	Moderate Breeze	11-16	1 - 1.5	Small waves, some whitecaps.
5	Fresh Breeze	17-21	2 - 2.5	Moderate waves, many whitecaps.
6	Strong Breeze	22-27	3 - 4	Large waves, some spray.
7	Near Gale	28-33	4 - 5.5	Mounting sea with foam blown in streaks downwind.
8	Gale	34-40	5.5 - 7.5	Moderately high waves, crests break into spindrift.
9	Strong Gale	41-47	7 - 10	High waves, dense foam, visibility affected.
10	Storm	48-55	9 - 12.5	Very high waves, surface white, visibility impaired.
11	Violent Storm	56-63	11.5 - 16	Exceptionally high waves, visibility poor.
12	Hurricane	>64	>14	Air filled with foam and spray, visibility bad.

Tow Validity

If the tow falls outside of the expected parameters

- Speed- 3.5 knots, If the speed remains above 5 knots or drops below 1 knot for too long the tow should
    - end and if outside the time range the station should be resampled
- Tow Time: 2.5 min (acceptable range 1-5 min)

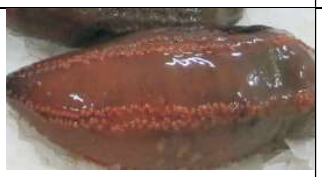
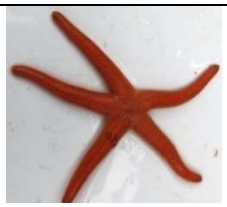
Or if

- There is evidence the dredge was upside down (backjob) (shiny rings on top)
- There is evidence the dredge was blocked by ghost gear or something else
- There is evidence that there was a significant gear damage resulting in lost catch
- Of if both the captain and the lead scientist determine the gear was not fishing correctly

The catch from that tow should all be discarded, and the station should be resampled trying to avoid the exact tow line just made, on the tablet you should replace the tow information with the one for the new tow, if you like you can provide comments.

If the station can't be sampled due to fishing gear, bottom conditions or another reason selected the nearest alternate tow location ideally of the same strata and make a comment for this tow location of why it could not be sampled.

Common Invertebrate Species List

Atlantic rock crab	*Cancer irroratus*		Jonah crab	*Cancer borealis*	
Green crab	*Cancer maenas*		Hermit crab	*Paragurus spp.*	
Stalked/ Clubbed Tunicate	*Note: some species are native some are invasive*		Sea anemone	*Note* Don't include if still attached to substrate*	
Colonial Tunicate	*Didemnum Vexillum is invasive*		Solitary Tunicates	*Many Ciona sp are invasive*	
Sea cucumber	*Holothuroidea spp.*		Common sea star	*Henrica spp.*	
Crumb of bread sponge (monkey dung)	*Halichondria panicea*		Blood star	*Henricia leviuscula*	
Green sea urchin	*Strongylocentrotus droebachiensis*		Brittle sea star	*Amphipholis squamata*	
Sand dollar	*Echinarchnis parma*		Sand Sea Star	*Astropecten americanus*	

Moon snail	*Polinces heros*		Ocean quahog	*Arctica islandica*	
Waved whelk	*Buccinum undatum*		Surf Clam	*Spisula solidissima*	
Stimpson's Whelk	*Colus stimpsoni*		Blue mussel	*Mytilus edulis*	
10 Ridged Whelk	*Neptunea decemcostata*		Horse mussel	*Modiolus modiolus*	
Crangon shrimp	*Crangon crangon*		Other	ID to lowest possible unit	Take Photos

Example Catch data

For this tow it was a little more than 1.5 bu of scallops about half a bushel of newly cut scallop shell, lots of rocks and a couple crabs and a hand full of fish. For Rocks, shell and crabs and other inverts no need to write a unit since the only value recorded is volume in liters. For the fish we write the number of fish then the estimated volume, in this example there would be 3 relatively small Sculpin and 1 big monk. For the scallops note that total numbers were recorded from 4 individuals, the total was then circled, the math can be done back on land.

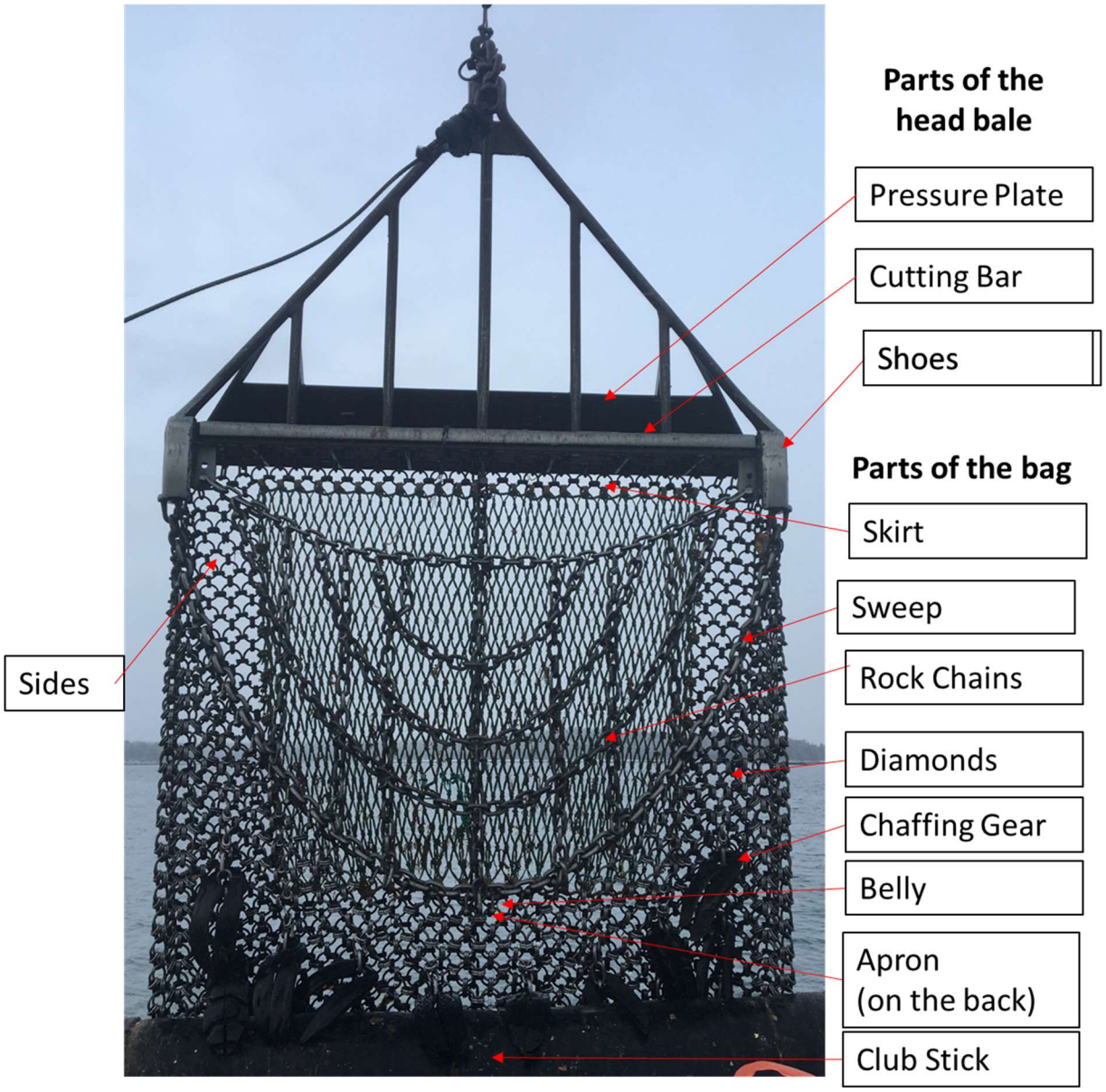
Tow 8	A7H15			3/15/2023	
Scal	8+156+33+115	312	65 L	23+17.5	40.5 Kg
Clappers	13				
Sea Cucs	-			Rocks	90
W. Floun	2-1.5L			New Scal Shell	20
Sculpin	3- 1L			RC	1
Monk	1- 5 L			JC	1.5

For this tow the catch was mostly monkey dung sponge with some rocks, some scallops some shell and some ascophyllum

Tow 1	A1H15			3/16/2023	
Scal	8+156	164	40 L	23 Kg	
Clappers	13				
Sea Cucs	-			Rocks	75
Brown Alg.	.5			New Scal Shell	15
Lob	2-75,83mm 1L			Monkey Dung	120

Note: *Be consistent with abbreviations and units, During data entry place a Check near the station ID, after QC is complete Circle the Check mark*

Dredge Specs



Gear Specs	
Headbale Width	7 ft
Pressure Plate Width	10 inches
Twine Top	5 inches
Hanging Ratio	2:1
Size of rings	2 Inch
Total estiamted weight	1200 lbs
Type of Sweep	5/8 Trawlex
Rock Chains	5/8 Chain
Up and Downs	1/2 Chain

Rows of Apron	30x10
Rows of Belly	30x10
Rows of Skirt	30x1
Rows in Diamonds	10x10
Rows in Side	14x5