Supporting Access for the Shellfish Community

Casco Bay Regional Shellfish Working Group

September 29th, 2022

Welcome and Introductions

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Agenda

- Welcome and introduction
- Contextual information
- Examples of land trust and shellfish collaboration
- Group discussion
- Wrap up and next steps
- Adjourn at 11:30

Shellfish Harvesting in Maine

- Culturally and economically significant:
  - Key source of food and community for Wabanaki people for millennia
  - Support local jobs and reinvestment back into Maine's coastal communities
  - Softshell clams and quahogs accounted for $25 million in landings in Maine in 2021
- Soft-shell clams, quahogs, and several other species of shellfish are co-managed by the state and municipalities

Photo by Bridie McGreavy

Casco Bay Regional Shellfish Working Group

- Initiative started to foster collaboration among shellfish community in Casco Bay
- Goal: to equip municipalities with the knowledge to manage their wild shellfish resources by providing a forum for sharing information, resources, and tools
- What we do: convene meetings, lead yearly initiatives - shared issues, and provide informational resources
  - Preserving Intertidal Access Guidance Doc
  - Shellfish Conservation Guidance Doc
  - Community Intertidal Data Portal

Intertidal Access

- Anecdotal evidence of decreasing access due to:
  - Loss of “handshake” agreements
  - Increasing population growth in coastal counties
  - Pressure from climate change
- Access considerations should also encompass:
  - Updated/safe marine infrastructure, such as stairs or docks
  - Parking and other measures to address overcrowding
  - Proximity to harvestable flats
- Negative physical and mental health impacts to harvesters

Intertidal Access Priorities

- Preserving Access to the Intertidal Guide
  - Created to help towns with approaches tailored to their needs, capacity, resources, and technical knowledge
  - Includes guidance on community outreach, addressing loss of access on private land or due to development, and expanding marine infrastructure

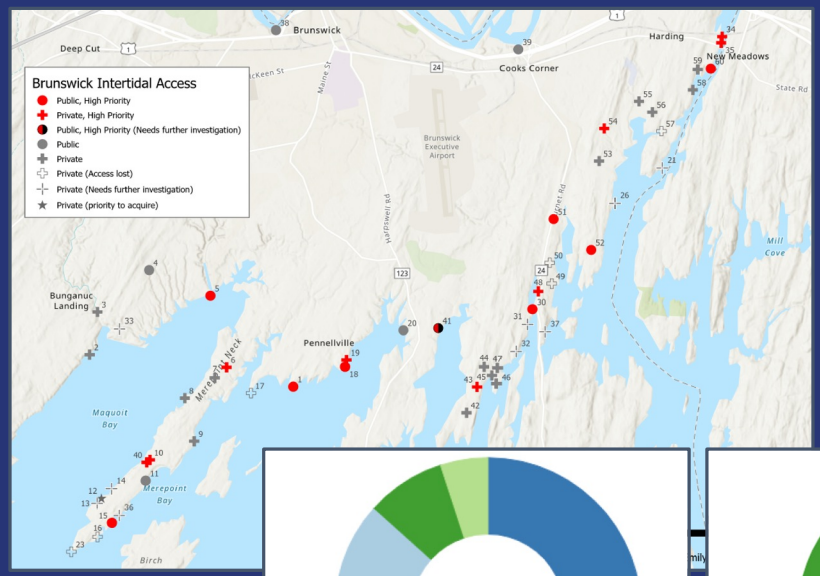
Maine's real estate boom is making it harder for clammers to get to mudflats

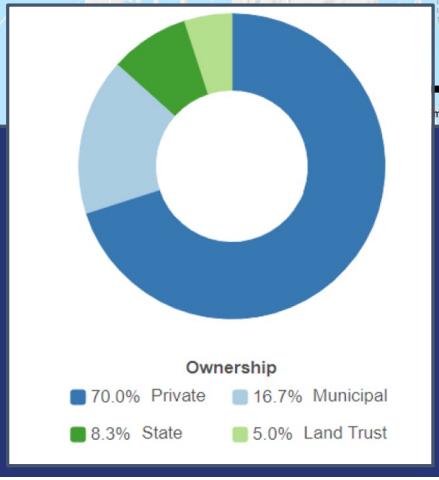
by **Ethan Genter**
July 19, 2022

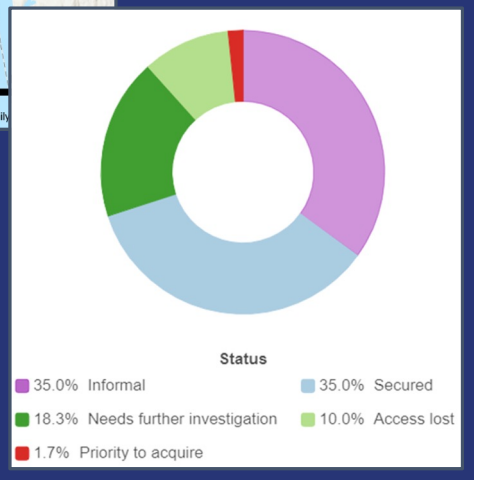
https://www.cascobayregionalshellfishworkinggroup.org/announcements

Intertidal Access Mapping Project

Pilot project led by Manomet to inventory public and private access to the intertidal for shellfish harvesting in Harpswell, Brunswick, Georgetown, Arrowsic, and Yarmouth

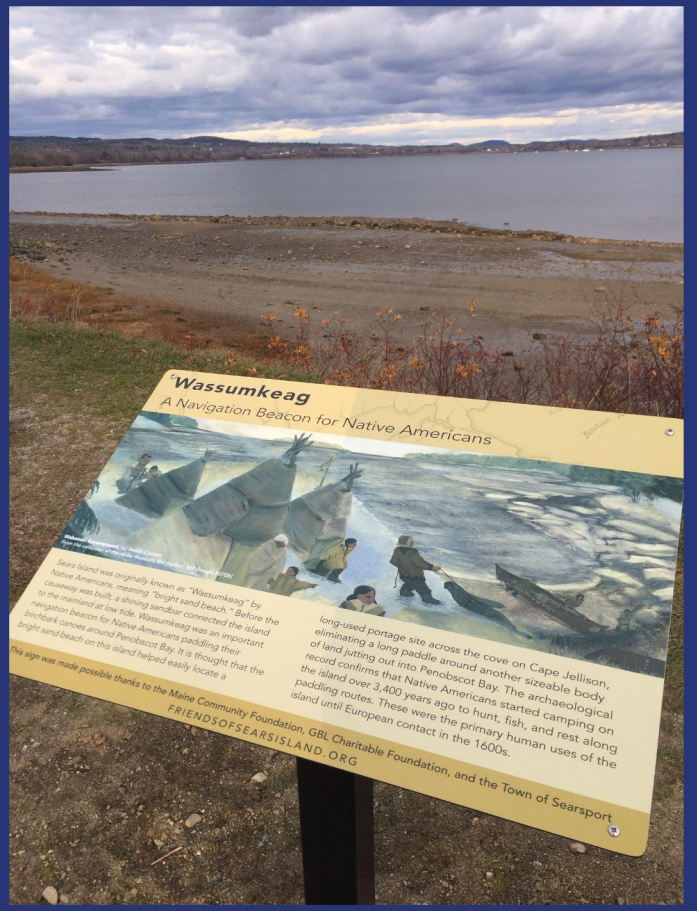






Wabanaki Access

- Wabanaki Historical and Contemporary access issues
  - Nutonesset
  - Colonial policy: Fort Andross
  - ME State Policies
  - What does that mean today?

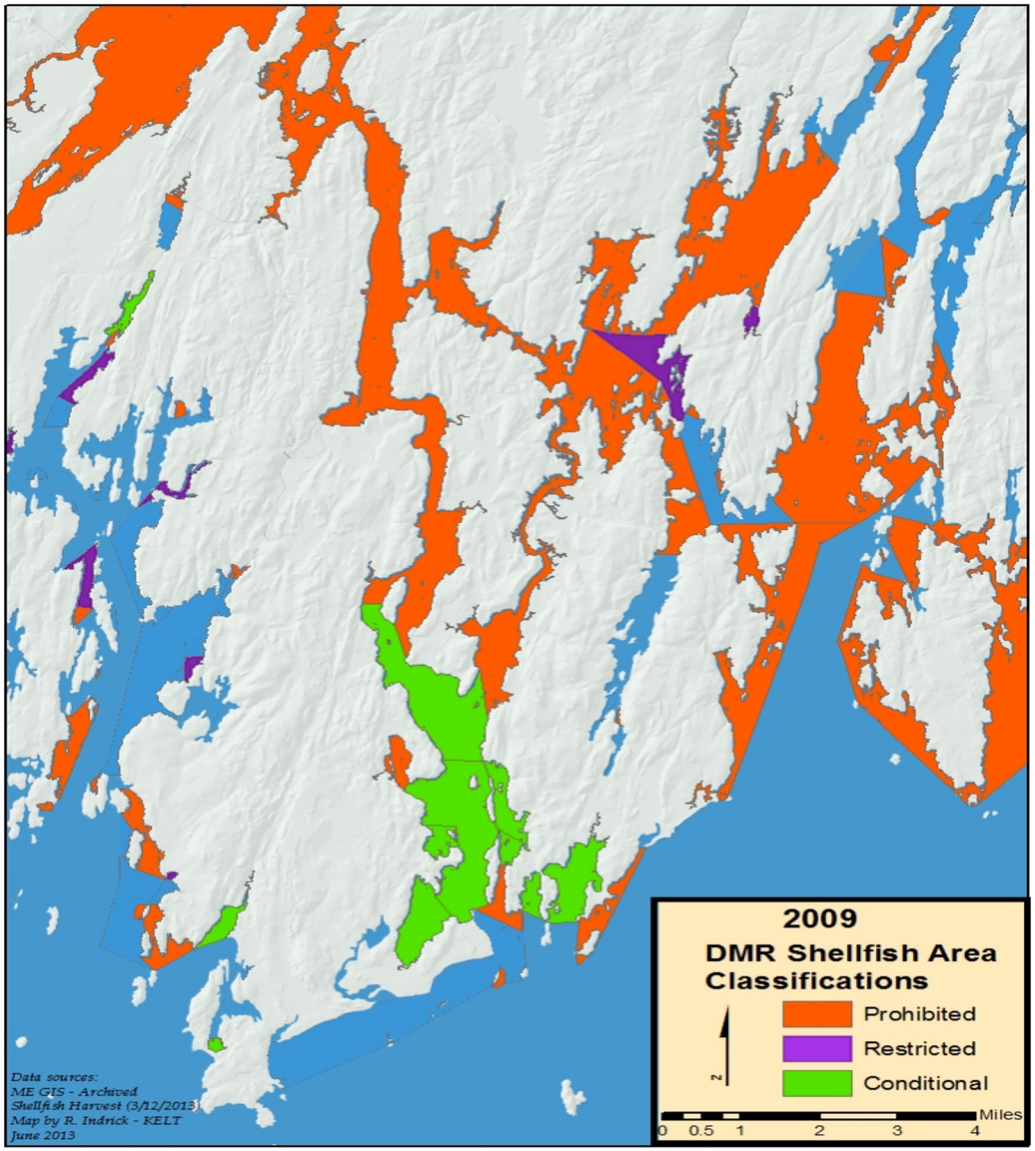


Collaboration with Land Trusts …

Kennebec Estuary Land Trust

KENNEBEC ESTUARY LAND TRUST

CLEAN WATER FOR CLAMS
WWW.KENNEBECESTUARY.ORG



Partnerships

State Agencies

DEPARTMENT OF Marine Resources STATE OF MAINE

DEPARTMENT OF ENVIRONMENTAL PROTECTION · STATE OF MAINE

Town and Local Organizations

KENNEBEC ESTUARY LAND TRUST

Mid-Coast Council of Governments

Androscoggin Valley Soil and Water Conservation District

Town Shellfish Committees and Wardens

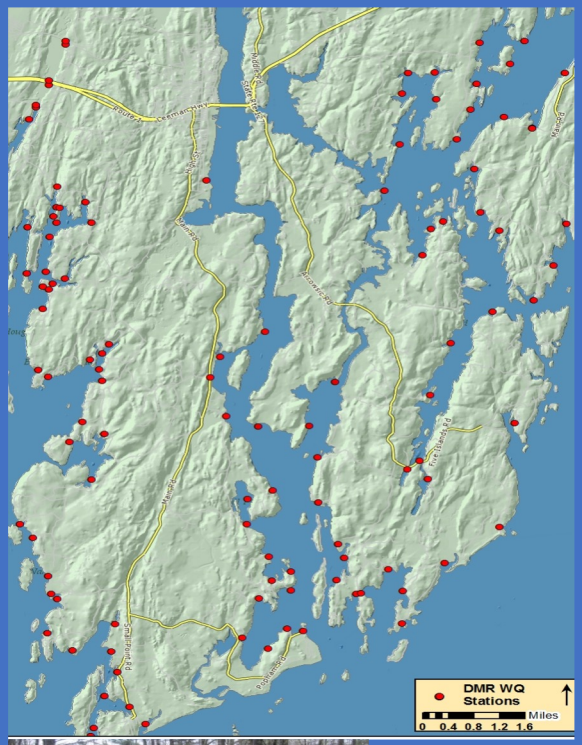
TOWN OF WEST BATH

THE TOWN OF WOOLWICH, MAINE · INCORPORATED OCTOBER 20, 1759

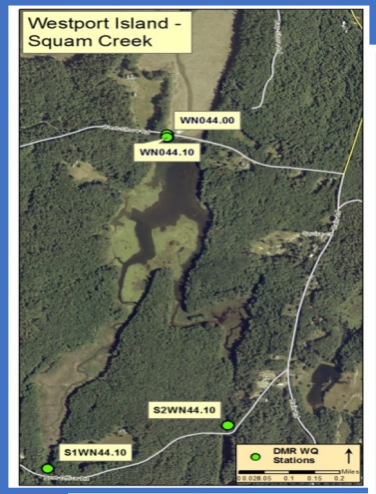
GEORGETOWN · MAINE · 1716

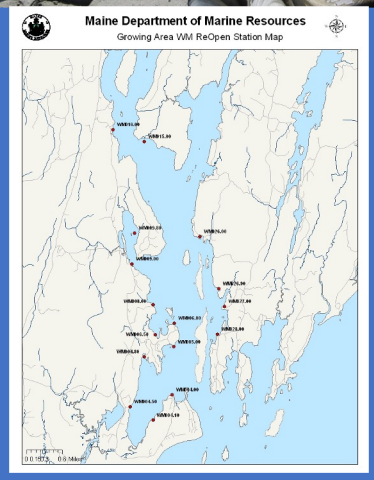
Targeted Sampling

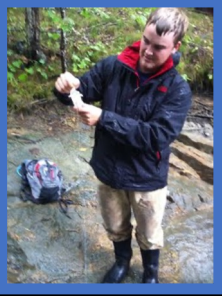
Partnering with the DMR

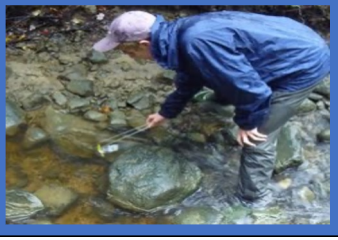


Extra Sampling for DMR of High Priority Areas and Streams









Outreach: Schools and Youth

Officer SALTY (4th grade) and Clean Water for Clams (6th grade)

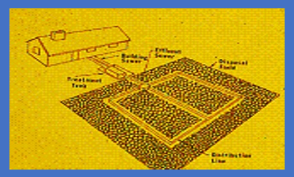
Class Field Trips to Clam Flats

Green Crab Trapping and Monitoring

Art Van Partnership

Outreach: Community

Septic Presentations for Code Enforcement Officers and Plumbing Inspectors



Town Outreach Programs

Clam Digging Explorations

Storm Drain Stenciling

Available Curriculum

Manomet Funded Clam Program

What's All the Clamor About Clams?

Grade level	4th or 5th grade
Subject Areas	Science, Environmental Education
Duration	40 minutes to 1 hour
Group size	5 to 30 students
Setting	Indoors; classroom friendly
Skills	Identifying Attributes and Components, Observing
Next Generation Science Standards	• 4-LS1-1 - Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. • 4-LS1-2 - Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways
Key Terms	Mollusk; univalve; bivalve; gastropod; cephalopod; filter feeder

Summary

Students will learn the basic physical and behavioral characteristics of common Maine organisms in the phyla Mollusca. They will take part in a dissection of a soft-shelled clam. During the dissection, they will learn about the process of filter feeding, the names of the parts in a clam, and the function of each part.

Objectives

Students will:

1. Learn that types of animals are grouped together by their characteristics and discuss the characteristics of organisms in the phyla Mollusca
2. Identify examples of Mollusks found in Maine
3. Learn the form and function of filter feeders and the anatomy of the soft-shell clam
4. Learn how clams interact with the surrounding water through filter feeding

Materials

- Student note sheet for *What's All the Clamor About Clams?*
- Maine Department of Marine Resources clam fact sheet and diagram
- Examples of shells from a selection of Maine mollusks that could include: periwinkle, dogwinkle, waved whelk, moon snail, limpet, slipper snail, soft-shell clam, surf clam, quahog, razor clam, scallop, American oyster, European oyster, blue mussel, horse mussel.
- Softshell clams to dissect (fresh and living - can be purchased from a seafood store)
  - one clam for each pair of students
- Clam dissection tools
  - Butter knife
  - Lunch or dissection trays - one for each pair of students

Keep it Clean for Filter Feeders

Grade level	4th or 5th grade
Subject Areas	Science, Environmental Education
Duration	40 minutes to 1 hour
Group size	5-30 students
Setting	Indoors; classroom friendly
Skills	Representing, Observing, Analyzing, Interpreting, Reasoning, Defining Problems, Concept Forming
Next Generation Science Standards	• 4-LS1-2 - Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways • 5-ESS2-1 - Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact • 5-LS2-1 - Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment • 5-ESS3-1 - Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. • 4-ESS2-2 - Analyze and interpret data from maps to describe patterns of Earth's features.
Key Terms	Filter Feeder, Bioaccumulation, Water Pollution, Regulation

Summary

This program will use a model to represent how filter feeders capture food and impact the water. Students will discuss sources of pollution in the water and will identify ways that pollution in the water affects clam harvesters. They will interpret maps of the coast to determine whether clam flats are open for harvesting.

Objectives

Students will:

1. Learn to define the terms 'filter feeder,' 'pollution,' and 'bioaccumulation.'
2. Be able to give examples of different types of pollution and identify where they come from.
3. Learn how to describe why pollution is harmful for clams and clam harvesting.
4. Be able to find a location on a map and answer a question by interpreting information on the map.

Materials

- Student note sheet for *Keep it Clean for Filter Feeders*, one copy for each student

It's a Clam Eat Plankton World

Grade level	4th or 5th grade
Subject Areas	Science, Environmental Education
Duration	40 minutes to 1 hour
Group size	5-30 students
Setting	Indoors; classroom friendly
Skills	Identifying Attributes and Components, Representing, Reasoning, Discussing, Evaluating, Problem Solving, Predicting, Concept Forming
Next Generation Science Standards	5th Grade: • 5-PS3-1 - Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun • 5-LS1-1 - Support an argument that plants get the materials they need for growth chiefly from air and water • 5-LS2-1 - Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment • 5-ESS2-1 - Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact • 5-ESS3-1 - Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment
Key Terms	Adaptation, Food Web, Plankton

Summary

Students will learn about what clams need to survive. After reviewing the four primary needs for survival, students will learn how clams meet these needs in their environment. They will do an activity to explore how clams and other shellfish species are adapted to the place where they get shelter and how their adaptations keep them safe from predators. They will build a food web for clams. They will then use what they have learned about clam survival to predict what characteristics make a place good for harvesting clams.

Objectives

Students will:

1. Learn the four primary needs for clams and will identify that humans have the same needs; they just meet those needs in a different way.
2. Learn that organisms have adaptations that make them well suited to the environment where they are found.
3. Be able to identify that the sun is the initial source of energy in a clam's food web.
4. Be able to describe the importance of plankton.
5. Learn how clams interact with the surrounding water through filter feeding.

How Many to Harvest?

Grade level	4th grade or 5th grade
Subject Areas	Science, Environmental Education, Social Studies
Duration	40 minutes - 1 hour
Group size	5-30 students
Setting	Indoors; classroom friendly
Skills	Analyzing, Concluding, Discussing, Evaluating, Problem Solving, Predicting, Reasoning
Next Generation Science Standards	• 4-ESS3-1 - Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment • 3-5-ETS1-1 - Define a simple design problem • 3-5-ETS1-2 - Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem • 3-5-ETS1-3 - Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved • 5-ESS3-1 - Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment
Key Terms	Commercial Fishing, Natural Resources, Management, Sustainable, Overharvesting, Conservation, Aquaculture

Summary

Students will learn about the importance of soft-shell clamming as a fishery in the state of Maine and how the fishery is managed. They will simulate clam harvesting in a game and will work together with other students to determine how to make their group have a profitable, sustainable clam harvest.

Objectives

Students will:

1. Define the words 'conservation,' 'sustainable,' and 'aquaculture.'
2. Identify why overharvesting causes problems for local fisheries.
3. Suggest management options that can limit overharvesting and support sustainable fishing.

Materials

- 140 to 210 softshell clam pictures, cut out
  - printed on cardstock or glued to cardstock paper would make them more durable
- *How Many to Harvest - Notes* – print one for each student
- A copy of *Three Wabanaki Legends*

CBEP Funded "How To" Guides

How-to Guide for Getting Students Out on a Clam Flat

Clam Flat Research and Conservation

Students can carry out projects on clam flats that support shellfish harvesting in their community.

These projects can:
- Inventory clam populations
- Test factors that impact clam survival
- Provide data about the health of local clam populations

Photo by Casco Bay Estuary Partnership.

Clam Flat Survey

Many shellfish committees carry out clam flat surveys annually to get a rough estimate of the number of bushels of harvestable clams present on a clam flat. The results from these surveys help them make decisions about the number of harvesters and licenses that their resources can support.

- Check with the Committee: Ask the local shellfish committee if there are any flats where it would be useful for students to help carry out a population survey.
- Resource: The Maine Clam Handbook, a publication of Maine Sea Grant, provides a detailed description of how to carry out a survey. It also includes a good description of the math that translates the field survey numbers to an estimate of bushels
  ⇒ https://seagrant.umaine.edu/wp-content/uploads/sites/467/2019/05/1998-maine-clam-handbook.pdf
- Equipment:
  - Survey Boxes - a 1ft.^{2} wooden box with window screen mesh attached to one side
  - Calipers or Rulers - rulers can also be screwed right onto the box
  - 100 ft. Tape Measure or 100 ft. Rope
  - Clam Rakes

Clam Recruitment Boxes

Square wooden boxes with mesh on both sides do a surprisingly good job of catching baby clams. The microscopic clam larvae floating in the water settles between the two layers of mesh and grows to be a centimeter or two in size over a season. The boxes can provide a source of small clams (called seed) to spread across the flats or protect under nets. By installing boxes and recording the number and size of clams within them, students could help to figure out which areas have the best recruitment for seed clams and provide a source of seed that a community could use to help repopulate their flats.

- Check with the Committee: Ask the local shellfish committee if they are already using clam recruitment boxes—also called Reef boxes. Ask if there are any flats where they would be interested in having some boxes installed.
- Resource: The Downeast Institute developed the recruitment boxes and has used them in a couple places. More info is at:
  ⇒ https://downeastinstitute.org/wp-content/uploads/2019/04/6_17-at-george-and-weskeag-project-clam-recruitment-study.pdf
  ⇒ https://downeastinstitute.org/research/soft-shell-clams/freeport-investigating-the-cause-of-the-clam-decline-2013-2019/
- Equipment:
  - Clam Recruitment Boxes
  - 1x3 Board - cut to make a 1ft. x 2ft. Box
  - Pet Screen
  - Thin Wooden Lath - to hammer or screw in over screen
  - At least 2ft. long wooden stakes or lath cut to have a point - to stake the box to the ground (important because the boxes will float away if not staked down securely)
  - Screws
  - Battery Powered Drill
  - Rubber Mallet

Plant Pot Experiment

Plant pot experiments are a relatively easy way to see how clams grow and document how well netting protects clams from predators. These experiments were piloted by the Downeast Institute. Students bury a 6in. plastic plant pot in the mud with just the edges sticking up. Some pots are left open, and others have netting covering their tops and buried around them in the mud. Experiments track how many wild clams settle and survive in the open vs. the covered pots, or students can place 10 hatchery seed clams in the pots and see how survival and growth differ between the open vs. the covered pots.

- Check with the Committee: Ask the local shellfish committee if there are any flats that are easy to access where the students could carry out a plant pot study and find out information about predation.
- Resource: The Downeast Institute is the expert in plant pot studies. Here's a link to information about a project they carried out with students in the Webhannet and Fore River:
  ⇒ https://downeastinstitute.org/research/soft-shell-clams/webhannet-and-fore-river-studies-2014-2015/
- Equipment
  - 6 inch plant pots
  - Window screen mesh
  - Optional: Clam Seed
- Finding Clam Seed: Clam seed can be collected on the flats or purchased from the Downeast Institute - the one hatchery in Maine that grows clams. Because it takes time to grow clams to a plantable size, they need order information months in advance. Details about ordering clams are at:
  ⇒ https://downeastinstitute.org/hatchery/soft-shell-clams/

Predator Protection Netting

Shellfish committees place nets with floats on their clam flats to protect the netted areas from predators. Sometimes, they will also place seed clams under the nets that they collected from somewhere in rows or purchased from the Downeast Institute. This repopulates the flats while also protecting the clams when they are small and most vulnerable.

- Check with the Committee: Ask the local shellfish committee if they have used nets on clam flats and have net materials. Ask if there are any flats where they would like students to help with netting and if a harvester or warden is available to show the students how to put in a net.
- Resources: Information about setting up nets can be found on pages 6-8 of the Manomet Clam Farm Guidebook
  ⇒ https://www.manomet.org/wp-content/uploads/2018/10/Manomet-Clam-Farm-Guidebook-2018_electronic-version.pdf
  Information from the Downeast Institute about how nets protect clams
  ⇒ https://downeastinstitute.org/research/soft-shell-clams/det-maine-dmr-collaborative-study-2014-2015/
- Equipment
  - Large nets with floats attached to the net with zip ties
  - Clam rakes
  - Optional: Clam Seed
- Purchasing Clam Seed: The one place in Maine that sells clam seed is the Downeast Institute. Because it takes time to grow clams to a plantable size, they need order information months in advance. Details about ordering clams are at:
  ⇒ https://downeastinstitute.org/hatchery/soft-shell-clams/
- Permitting Needs.
  1) If you're transporting undersized clams from one place to another, either from the hatchery or from another flat in town, you will need a DMR permit (free) available at
  ⇒ https://www.maine.gov/dmr/shellfish-sanitation-management/programs/municipal/forms/documents/TransplantFormEditedV3.2018.pdf
  2) Large netting projects fall under US Army Corps of Engineers jurisdiction over structures in navigable waters. They may require a general permit. Contact info for the Maine USACE office is at:
  ⇒ https://www.nae.usace.army.mil/Missions/Regulatory/

Created by the Kennebec Estuary Land Trust with generous support from the Casco Bay Estuary Partnership.
www.kennebecestuary.org - www.cascobayestuary.org

How-to Guide for Getting Students Out on a Clam Flat

Learning to Dig Softshell Clams

Step 1 **Connect with shellfish harvesters or the shellfish warden by stopping by the town office, attending a municipal shellfish meeting, OR calling the local shellfish warden.**

A commercial harvester assists a Phippsburg student to measure a clam to see if it's legal to keep. Photo by Casco Bay Estuary Partnership.

- Ask if the warden or municipal shellfish committee members would be willing to attend the field trip and help instruct students on how to dig softshell clams
- Ask if the warden or municipal shellfish committee have clam rakes they may be willing to let the students borrow during the field trip
- Ask the warden for permission for the students to dig and keep softshell clams they find (softshell clams are 2 inches long, lengthwise)

Step 2 **Identify a clam flat to visit.**

- Ask the warden or municipal shellfish committee member for suitable locations that are open for digging
- Keep in mind: ease of access for bus pick-up and drop off, do you need to cross private property and if so, get permission from the landowner, is the clam flat productive for digging, i.e. will students find clams?
- If there is not a suitable clam flat in your town, an option could be to investigate access from state owned lands. For example: Reid State Park in Georgetown has access to clam flats and visitors can dig up to 1 peck of clams without a license.

This clam flat in Phippsburg is open to commercial digging and open to visits by students with permission from the town's Shellfish Conservation Committee. Photo by Casco Bay Estuary Partnership.

Step 3 **How to find clam rakes and prepare students.**

A Phippsburg student borrows a worn clam rake to dig clams. Photo by Casco Bay Estuary Partnership.

- Clammers wear down their clams rakes, also called clam hoes, over time, and they sometimes have old rakes that are no longer useful for commercial harvesting. These worn rakes could be borrowed by students for the field trip.
- The day of the field trip, students should wear old clothing that can wet and muddy as well as mud boots to protect their feet. Encourage students to bring a change of clothing to school in case they get really dirty on the flats.

Step 4 Day of the Field Trip

- Timing:
  - Plan for at least 60 minutes onsite for: safety talk, clamming demonstration, digging, and clean-up.
- Supplies list:
  - clam rakes
  - plastic bags for students' dug clams and for muddy clothing
  - first aid kit
  - clam measurement rings (cut 2-inch PVC pipe into ~1/4 inch rounds)

Clammers and local experts to teach students about shellfish and habitats is important. Photo by Casco Bay Estuary Partnership.

- Safety Talk Tips:
  - Clam rakes have sharp tines therefore NO running while holding one and NO swinging it around.
  - Always be aware of people around you so no one gets poked or hurt!
  - Stuck in the mud? Point your toe and lift your heel to break the mud-suction on your boot.
  - When not in use, clam rakes should be stored with the sharp tines in the mud.
  - If feeling for clams in the mud or sand, be careful near the edges of clam shells. They are thin and can cause cuts (like paper cuts) on the tips of fingers.
- Demonstration:
  - Ask a warden or clammer to demonstrate how to dig a softshell clam.
  - If students have dug before, perhaps ask them to help other students who have not dug clams before.
  - Visit those resource links for information on shellfish harvesting rules
    ⇒ Maine Dept. of Marine Resources (DMR) Shellfish Identification: www.maine.gov/dmr/shellfish-sanitation-management/shellfishidentification.html
    ⇒ Maine DMR General Town Shellfish Information: www.maine.gov/dmr/shellfish-sanitation-management/programs/municipal/landmarkets/townlinks.html
- Clean-up Tips:
  - Students should try to rinse off mud or sand on clam rakes and their boots, if possible. Using paddles on the flats can work well.
  - Pass out trash bags for students to sit upon on the bus if there's no good place to rinse off clothing or change out of muddy clothing onsite.

Students will discover a variety of marine critters in the mud. Photo by Casco Bay Estuary Partnership.

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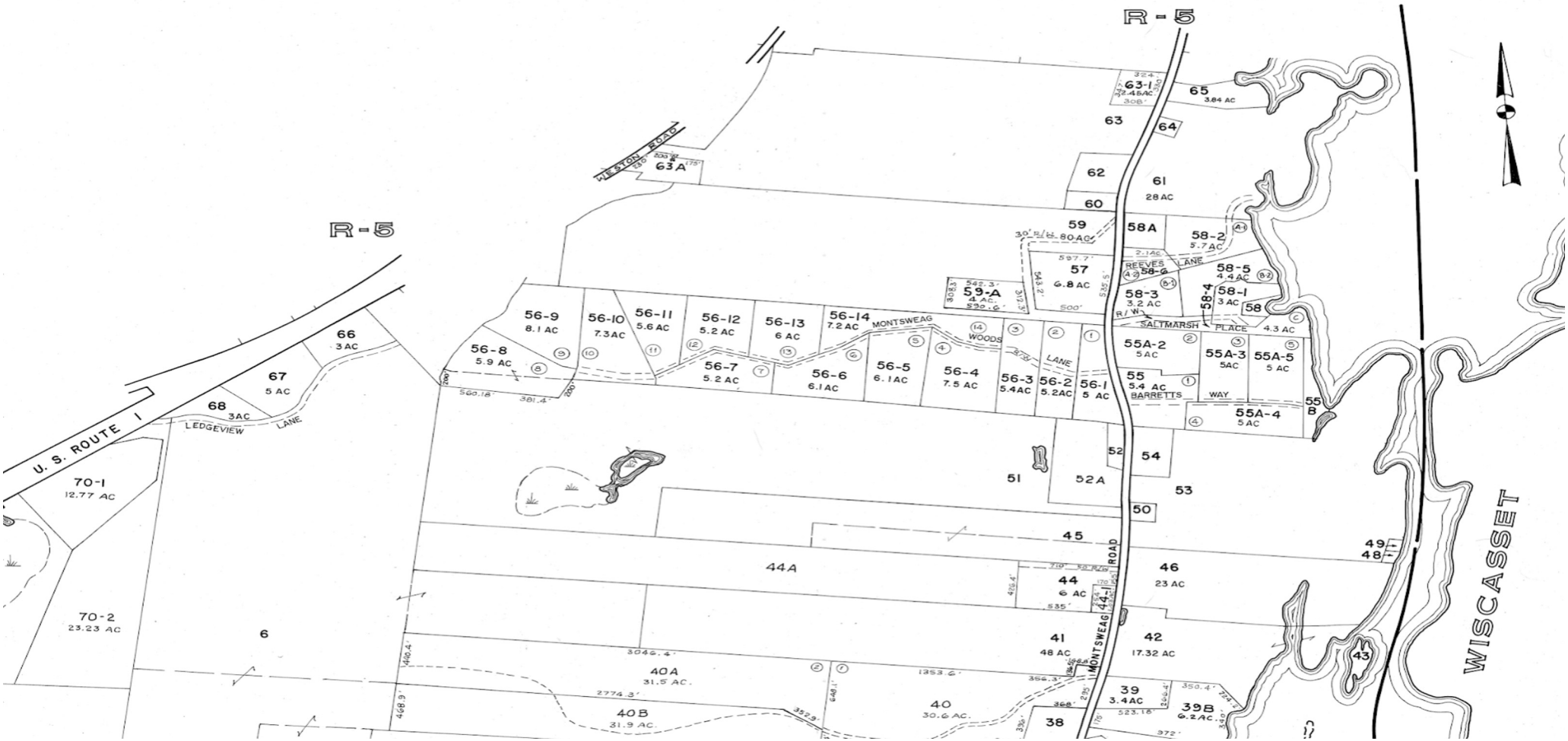
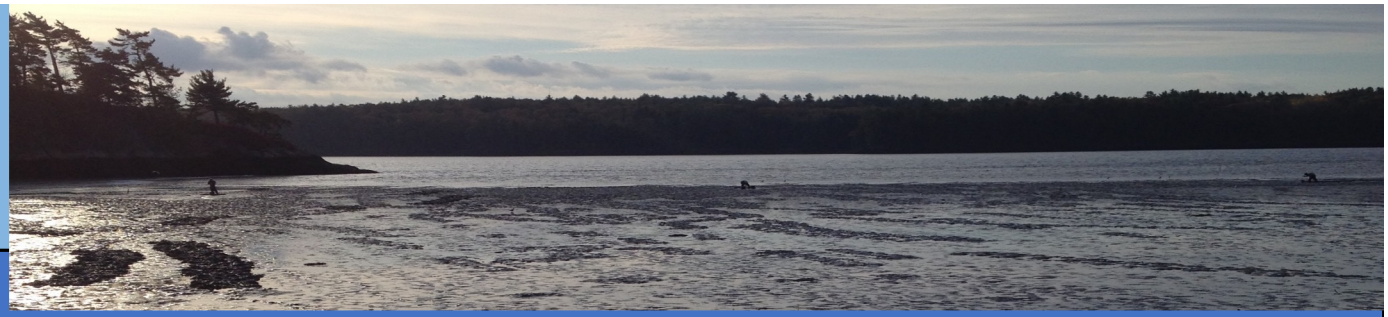
www.kennebecestuary.org - www.cascobayestuary.org

Access Challenge



Access Success



Dewick Farm Easement

- *"**Conservation Purposes** -It is the purpose of this Conservation Easement to provide significant public benefit by protecting and preserving in perpetuity:*
  - *… **(c) the highly productive worm and shellfish beds;** …*
  - *… **(e) the opportunity for clammers and wormers to access the Protected Property for harvesting in adjacent mudflats** …"*
- **"RECITALS -** The following recitals more particularly describe the conservation values of the Protected Property and the public benefit of this grant.
  - **… WHEREAS, the Grantor has and will continue to provide parking and pedestrian access to Montsweag Bay and Brookings Bay for the search and harvesting of marine life;"**
- **"Recreational Uses**
  - **… Public Working Waterfront Access. Grantor grants Holder the right to assure that the general public will have pedestrian access over and across the Protected Property from the Parking Areas to the intertidal zones of Montsweag Bay and Brookings Bay in order to search for and harvest fish, clams, worms and other marine life."**
  - **… Public Use of the Parking Areas. Grantor grants Holder the right to assure that the general public will have vehicular and pedestrian access over and across Phipps Point Road and Parking Areas. Grantor may use the Parking Area for Grantor's property management activities, provided that such use does not damage the Parking Area or unreasonably impact the public's use thereof. Grantor shall be responsible for prompt repair of any damage to the Parking Areas arising out of Grantor's use."**

Maine Coast Heritage Trust

Woodward Point

Old Eastport Road

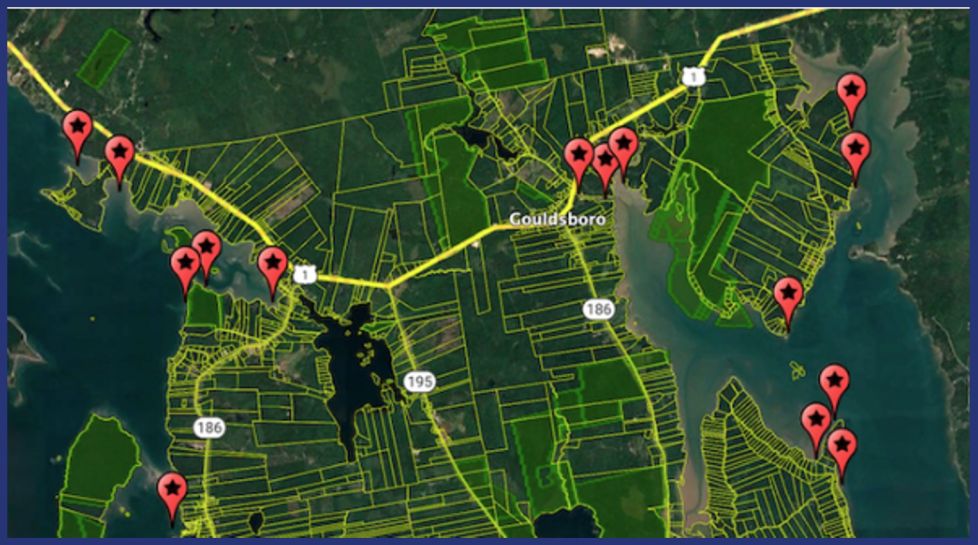
Bailey’s Mistake

Gouldsboro Shore Initiative

Frenchman Bay Conservancy

Maine Coast Heritage Trust

https://gouldsboroshore.me/



A map of important shellfish harvesting locations, courtesy of Gouldsboro Shore

Discussion

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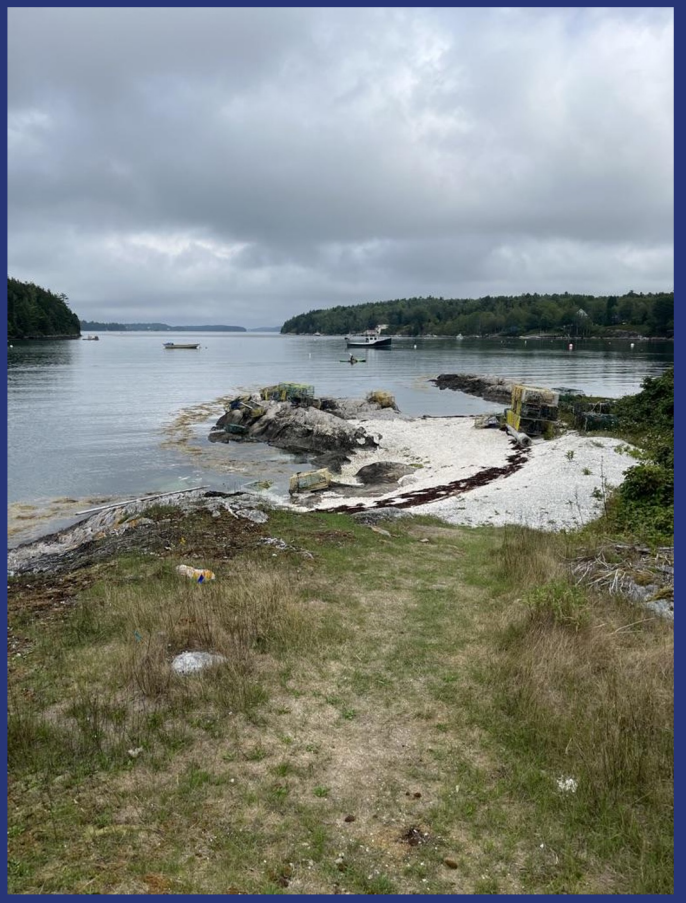
Discussion Questions

- Please share your experience if you have worked with shellfish committees or harvesters in the past.
- Are there any potential projects for future collaboration with the shellfish community that come to mind?
- What barriers are there to supporting intertidal access through land trust projects?
- What information would be helpful for you to have from shellfish committees in your area?
- How can our group facilitate collaboration between these two groups?

Next Steps

- Email connection this fall with shellfish committees
- Newsletter sign-up
- Upcoming meeting in the fall/winter



Thank you!

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Photo by Christine Stack Photography