



A Guide to Shellfishing in Brunswick

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Introduction

This guide contains information on Maine's shellfish industry and includes information on soft-shell clams, quahogs, American and European oysters, and razor clams. This guide contains information regarding the history of the shellfish industry, the biology of these shellfish, the threats they face, the equipment and gear needed to harvest, and the rules, regulations and laws that keep the fishery sustainable.



History

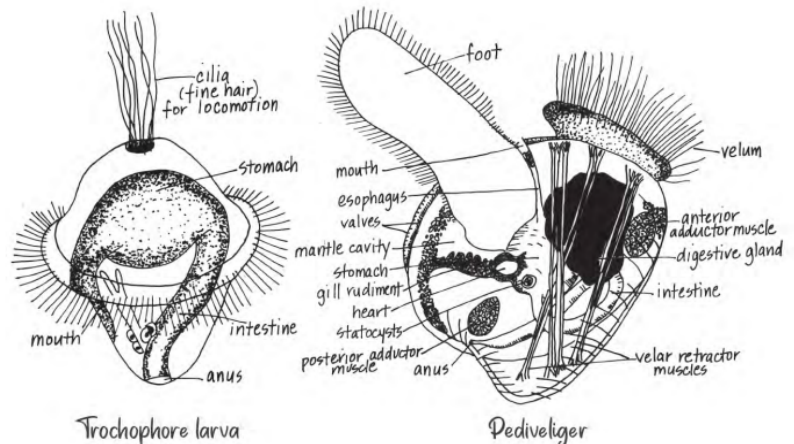
Shellfish are an important part of Maine's culture and have been for centuries. Piles of Shellfish (middens) have been located up and down the coast of Maine, showing that the Wabanaki Tribes and early settlers used shellfish quite often for sustenance. Native shellfish populations have decreased drastically since then, leading to the implementation of aggressive local management strategies in the 1970's. Maine and Massachusetts are the two remaining states in the United States where shellfish are managed locally. This hyper local management approach allows municipalities to develop diverse approaches that reflect their particular social, economic, and political

characteristics. Coastal Towns with state approved shellfish management plans manage their shellfish resources in the intertidal zone, which is defined as the shores, flats below the high-water mark and above subtidal lands. While landowners along the shore may have deeds that show ownership to the low-tide mark, the public maintains the right to access the intertidal zone for “fishing, fowling, and navigation” purposes. These rights were established by the Colonial Ordinance enacted by the Massachusetts Bay Colony in the 1600s and legally adopted by Maine when it became a state in 1820. Currently there are approximately 70 coastal municipalities along the 3500 miles of Maine Coastline that manage the shellfish resources in their own particular way. Please be sure to check the local town regulations before harvesting.

Biology

Soft shell clams, quahogs, razor clams and oysters all belong to a group of bivalves known as filter feeders. These organisms obtain their food from microscopic particles that grow in the water column. These microscopic food particles consist of plant cells (phytoplankton) and animal cells (zooplankton) and even bacteria. Filter feeders take in water, remove nutrients and release clean water back into the water column. For this reason, filter feeders are extremely useful in maintaining the health and water quality of the marine ecosystem. These organisms reproduce by releasing eggs and sperm into the water column where they meet, become fertilized and once heavy enough, they sink and settle on the bottom. When young, soft shell clams and quahogs possess a byssal thread to help hold them to the bottom and once mature they lose this byssal thread and burrow into the sediment. Oysters however cement themselves to hard surfaces such as rocks and ledges where they will spend the remainder of their life.

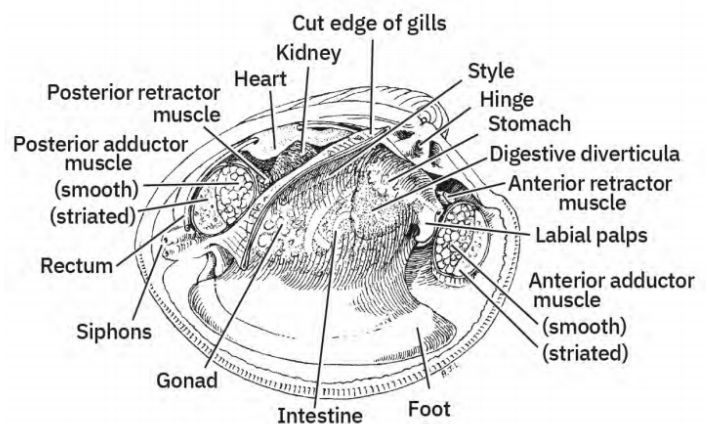
Soft shell clams (*Mya arenaria*) are invertebrates that reside in intertidal flats and sub-tidal regions. Soft shell clams have a legal size of two inches and take anywhere from two to five years to grow to legal, harvestable size. Soft shell clams have been the primary shellfish harvested in Maine for the last several decades. However due to the increasing water temperatures and predation hardshell clams i.e. quahogs are becoming more prevalent along the Maine Coast and have been identified by several municipalities as an emerging marketable species.



The hard clam or quahog (*Mercenaria mercenaria*) are found in the intertidal and sheltered subtidal areas along the coast. They are referred to by many different names depending on

their size. From smallest to largest they are known as, littlenecks, topnecks, cherrystones and chowders. On the outside of a quahog shell are growth rings that can be used to determine the quahog's age, similar to how a tree is aged. Once a quahog reaches a

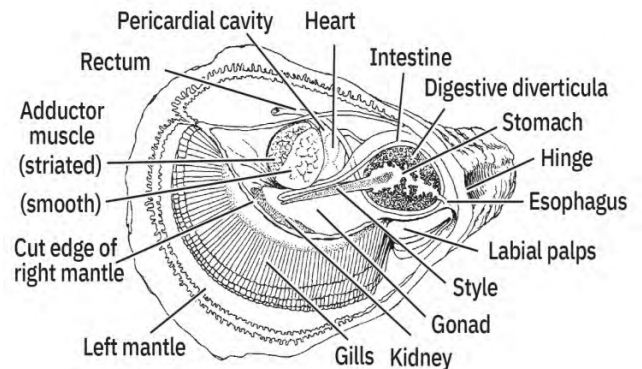
large enough size, predation rates drop as the quahog's thick shell becomes more difficult for predators to penetrate. Quahogs spawn once a year producing between 1 and 5 million eggs per spawning event. Quahogs have slow growth



rates averaging three to five years to reach harvestable size. The legal harvest size is 1" thickness measured at the hinge of the animal.

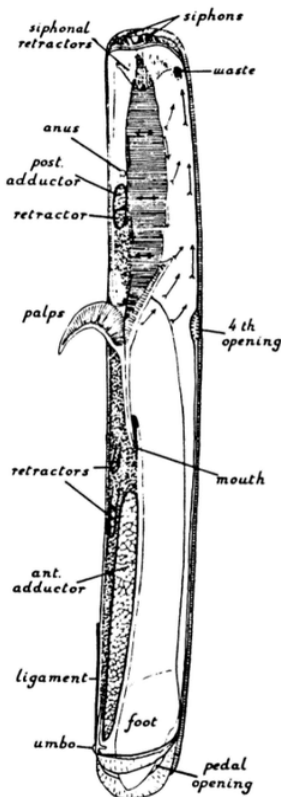
American Oysters (*Crassostrea virginica*) have two rough whitish irregular shaped shells held together by a hinge. They naturally grow on rocks or ledges, but most are grown using aquaculture methods. The legal harvest size for wild American Oysters is 2.5 inches long.

European Oysters (*Ostrea edulis*) are characterized by a shell that is rounder and flatter than the American Oyster. European Oysters are often called Belones or



European flats. These

oysters are not native to Maine and were introduced to Maine in 1949 by the Maine Department of Marine Resources to address the ongoing decline of native shellfish populations. This introduction has led to established wild populations that are still commercially harvested today. The legal harvest size for European Oysters is 3".



Razor clams (*Ensis directus*) are filter feeding bivalve mollusks that are long and skinny and shaped like a jackknife. The muscular foot of the razor clam is capable of extending to roughly one-half of the clams length. This foot helps the clam to dig and bury itself in the mud. Using the muscular foot, the clam can quickly respond to stimuli often burrowing itself deeper than the harvesting rake once alerted to its presence. The legal harvest size is 4 inches.

Predators

Maine shellfish have a few common predators including starfish, moon snails, and milky ribbon worms with the best known predator being the invasive European green crab. Starfish feed on shellfish by forcing the shell open using suction disks and then inserting stomach membranes out through its mouth into the shell. Moon snails use a slightly different approach to eating shellfish. The moon snail uses its radula in conjunction with an acid secretion to bore a hole through the shell where it will insert its proboscis and feed on the prey. Similar to the moon snails, milky ribbon worms live on the ocean bottom and in the soft sediment. They are self autonomous, breaking into pieces to escape predators and having asexual capabilities. Unlike traditional bottom predators, milky ribbon worms feed on shellfish from below by impaling shellfish with their proboscis. Green crabs use a more conventional approach to feeding. Using their pincers, green crabs will break the shell to eat the flesh within.



Harvesting Equipment and Measuring Tools

Having the proper equipment for harvesting is extremely important for safety reasons as well as legal size regulations. The first important piece of equipment needed to enter the mudflats are a pair of tight ankle hip waders. These boots are of necessary importance and protect the harvester from the waist down against sharp shells and large amounts of mud. In addition to protecting the feet and legs it's also important to protect your hands using gloves. Gloves come in different lengths and thickness that can be used depending on the different conditions or personal preference. Other digging essentials consist of a rake (clam hoe), peck bucket, mesh catch bags and appropriate measuring tool.

To properly dig soft shell clams and razor clams, a rake is needed to overturn the mud approximately 6-10 inches. This method exposes the clams, which can then be harvested. If you pay close attention to the surface of the mudflat you can identify where softshell and razor clams are by finding their blowholes. Blowholes are small holes on the surface of the mud that clams create to be able to feed on the seawater while remaining protected underneath the sediment. It is important to rebury any unharvested clams to protect them from predators as well as excessive sun and heat exposure.

Quahogs live just below the surface of the mudflats (2-4 inches) and in many places can be easily



harvested by hand. They are covered by water all the time and commonly harvested using a bull rake.

American Oysters are often found clutched to ledges, rocks and pebbles whereas their European cousins are often found resting on the ocean bottom. It is good to take a prying device to harvest oysters attached to rocks and ledges.

A recommended peck bucket is needed to place the shellfish in immediately upon harvest. Mesh bags are used to dump the shellfish from your peck bucket into when finished harvesting. These provide quick and efficient methods to wash the mud off the shellfish by repeatedly submerging the bag in the water until the shellfish are clean. Shellfish should be cleaned in the same waters from which they are harvested.

There are size regulations placed on shellfish to avoid taking “shorts” or shellfish that are deemed too small to be sold. Soft shell clams have a legal size of two inches, quahogs must have a minimum hinge of 1 inch, oysters must be three inches in length and razor clams must be four inches.



Harvesting Boats

Harvesters prefer to use either motor boats or airboats to make getting to the mud flats, maneuvering around them, or landing their catch easier. Airboats are beginning to be a more popular option as they do not require water to be mobile. When using a watercraft it is important to carry the required safety essentials including PFDs, and distress signaling devices such as a flare or horns. Lights however are not needed as it is not permitted to dig for shellfish after dark.



There are multiple different types of PFDs including types I through V and immersion suits. It is recommended to check the local harbormasters office to find out which PFD type is required. PFD type V includes deck suits, work vests, board sailing vests and vests with a safety harness.



These special use devices are intended for use with specific activities and can provide performance of either type I, II, or III of PFD but must be used according to its label.

License Activity

The Town of Brunswick offers recreational shellfish licenses for sale through the Town Clerk's Office. Licenses are available to both residents and nonresidents. Shellfish licenses are active for one-year starting the first Monday in April. For residents, the recreational licence fee is \$50 and for non-residents the licence fee is \$75. Non-resident licenses are sold at a rate of one per every ten resident licenses sold. A wait list is offered and can be applied for by visiting the Town Clerk's office.

When in possession of a recreational shellfish license, it is illegal to possess more than one peck of shellfish in one twenty four hour period from the coastal waters of the town. These shellfish are not allowed to be sold and must be kept for personal use only.

Shellfish Closures

Shellfish growing areas are closed for various reasons. The water is tested on a routine basis to ensure the areas remain free of pollutants and the shellfish safe to eat. Certain areas are closed for conservation of the shellfish and other areas may be closed for pollution or heavy runoff from recent rains. Some areas are on a conditional rainfall closure and will close after receiving 1 inch of rain in any 24 hour period. When the rainfall exceeds 2 inches in any 24 hour period all harvest areas automatically close. It is important that you check the status of



the harvest area before you start out. You can check the status by contacting the local marine warden or visiting the Maine Department of Marine Resources Website.

Local Shellfish Rules

(Laws are specific to each town)

In the Town of Brunswick harvesters are allowed to harvest one hour before sunrise to one hour after sunset. There is no night harvesting. Sunday harvest is prohibited from June 1st to October 1st. It is illegal to harvest from a mudflat when it is covered by tidal waters. It is illegal to sell your catch if you are a recreational harvester. The local regulations for shellfish harvesting can be found on the Town of Brunswick Website.

Shellfish Management

The Town of Brunswick has been managing the local shellfish resources since 1970. Local shellfish resources are limited. A commercial, recreational, bushel or student shellfish harvester can be expected to harvest a certain volume of shellfish per year; therefore, the number of shellfish harvesters must always be controlled to help preserve the shellfish resource.

The local marine resource management committee is composed of recreational and commercial harvesters, scientists, biologists, local residents and shellfish farmers. The purpose of the committee is to administer and coordinate local shellfish sustainability efforts. The shellfish management committee meets monthly where they discuss among many



things, the health of the flats, water quality, conservation closures, new scientific findings regarding shellfish, and the populations of predators. The shellfish committee also reviews shellfish farming applications and proposed structures in the mudflats that may affect local shellfish resources. Local management practices that include both scientific information and local knowledge prove to be the most effective. In order to meet the increasing shellfish license demand, the town must balance the use of the resources and conservation efforts.

The State of Maine allows each municipality the ability to create their own management strategies as long as their management plan meets the requirements. These requirements include:

- A minimum size limit of each shellfish the municipality manages
- Adequate local enforcement through the hiring of a certified municipal shellfish conservation warden
- 10 percent of all licenses sold are sold to non residents. The ordinance may not discriminate between resident and non-resident license holders.

The Town of Brunswick has a fulltime marine warden. This marine warden has many responsibilities including enforcing the marine resource conservation laws of the town and state, assisting with shellfish inventory and seed surveys, providing a communicative pathway between the state, town, and the harvesters, performing water quality tests and assisting in the reseeding of areas. Water quality testing is important, as it assesses the health of the harvest area and determines whether the area can continue to open for shellfish harvesting or farming.

Shellfish inventory surveys are a critical piece of the overall management strategy. These surveys are mandated by local laws and are completed every other year. These surveys are important because their results



determine the amount of new licences that can be issued the following year. In addition to shellfish inventory surveys, seed surveys and predator surveys are also conducted by the Town's Coastal Resource Office to determine future shellfish populations and the amount of threats the shellfish are facing in certain areas, which helps to predict the amount of mortality the shellfish may face in the coming years.

Harvesters can provide important observations in harvesting areas, including observations of how the populations are doing, on any new shellfish seed sets, as well as observations of potential water quality problems. Commercial harvesters are required to report landings data to the Maine Department of Marine Resources. Harvest data provides information on harvest area production, economic values, and the shellfish diversity in certain areas.

Glossary of Terms

Autonomous: existing and functioning as an independent organism.
growing naturally or spontaneously, without cultivation

Biotoxin: a substance that is toxic and has a biological origin

Bivalves: being or having a shell composed of two valves

Byssal Thread: A mass of strong, silky filaments by which certain bivalve mollusks, such as mussels, attach themselves to rocks and other fixed surfaces

Fecal Coliform: A group of bacteria that are passed through the fecal excrement of humans, livestock and wildlife

Intertidal: The area that is exposed to the air at low tide and underwater at high tide (the area between the low and high tide lines)

Invertebrate: An animal lacking a backbone

Middens: prehistoric rubbish or garbage heaps containing the remains of shellfish eaten by Aboriginal people

Proboscis: an elongated appendage from the head of an animal, either a vertebrate or an invertebrate. In invertebrates, the term usually refers to tubular mouthparts used for feeding and sucking

Subtidal: the area where the seabed is below the lowest tide but still shallow and close to shore

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