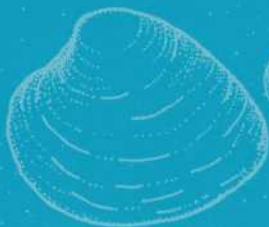




A Guide to



RECREATIONAL CLAMMING: KEYHOLING





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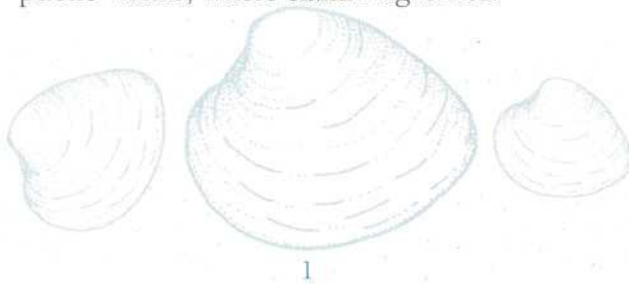
Introduction

Hundreds of thousands of tourists visit the North Carolina coast every year to swim, sunbathe, fish and pursue other pastimes. Many of them do not realize that the areas they frequent are also prime grounds for another type of recreation: clamming. In coastal North Carolina, visitors and residents can harvest clams for their own fresh seafood dinner.

Many locals, however, never go clamming because they do not know how to find clams. Except for blind raking — pulling a rake through the sand hoping to find clams without looking for or recognizing clam signs — recreational clamming has been limited to those whose family or friends have passed along tips for detecting a clam's hiding place in sand.

But times have changed. In 1996, North Carolina Sea Grant helped introduce rake-your-own clamming at a Hatteras clam garden where folks can harvest their own fresh seafood and spend hours having fun. Although there is a nominal fee because the clam beds lie in privately leased waters, rake-your-own clamming is a new way to give more people access to one of North Carolina's tasty resources.

The information in this booklet will help you take advantage of the bounty of clams in public waters, where clamming is free.



Biology of Hard Clams

Found abundantly along the entire North Carolina coast, hard clams (*Mercenaria mercenaria*) are especially accessible near inlets and a few miles inland where salty water flows into and out of the sounds. Throughout the year, a bounty of clams lies just a few inches beneath the sand in shallow water. Understanding some basic hard clam biology will help you locate clams by looking for signs of their presence.

Hard clams are bivalves, with a hinge at the thickest union of the two shells. The shells are smooth but very hard. The clam body inside has two muscles for opening and closing the shell. When the shell is open, the clam extends a "foot" into the sand, expands the end of the foot and then pulls itself under the sand. This process displaces sand around the shell, pushing up the sand on all sides and creating a depression in the otherwise smooth surface directly over the clam. The depressions will disappear over time as water fills them, but may reappear when the clam digs to reposition itself.

Two siphons, or tubes, extend from the clam through the shell opening and sand to the water above. These allow the clam to breathe, eat, and expel water and waste. One siphon brings in water, and the other pushes it out. The

inhalant siphon makes a smaller hole than the exhalant siphon. Because they function simultaneously, the holes they open in the sand form a configuration like that of the keyhole for old skeleton key locks.

The exhalant siphon alone is responsible for making several signs important for clammers to recognize. The first is what locals call a "spitting sign," a tiny fountain of water the clam squirts from beneath sand. When the clam spits, it expels water to purge wastes or to make more room for its

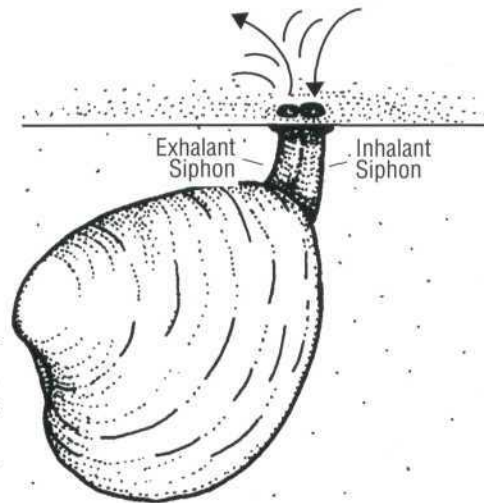


Figure 1. Water is drawn in through the inhalant siphon and expelled through the exhalant siphon. When purging, the clam squirts water one to three inches above the sand. This visible miniature fountain of water indicates that a clam lies beneath the sand.

body inside the shell when it closes itself as a defense mechanism. The clam will sense your presence as you walk near and, using the siphon, will squirt water straight up one to three inches before closing. This spitting behavior produces water droplets on

dry sand or small dark spots on light sandy bottoms where the water droplets deposit darker sand. The exhalant siphon also excretes tiny yellow or orange beads of clam waste, which settle on the sand near the clam.



Scott Taylor

Hard clams are bountiful along the North Carolina coast.

Recreational Clamming

With little or no instruction, locals and tourists of all ages can use four methods to help themselves to a feast of clams. First, though, ask at local tackle shops, marinas, fish houses, fishing piers or waterfront docks about where the clamming is good. Usually people at these places are knowledgeable about clamming in their area and will tell you where to find easily accessible beds. In general, clams north of Hatteras Island lie in the firm sand near ocean inlets. The many clam beds south of Hatteras Island are also found near ocean inlets, with clams embedded in softer, almost muddy sand or even in the soft sand of grass beds.

Finding Exposed Clams

Walk along sandy shoals near inlets at low tide after a storm. Wind



Jim Bohlen

Storms often leave clams partially exposed.

and ensuing above-normal currents intensify water movement and often partially or totally wash sand away from clams. Gathering these exposed clams is as easy as picking up seashells. Although infrequent, this phenomenon allows you to identify good grounds to visit later, when the clams are not so serendipitously exposed. Because the next tide may bring the sand back, this method of clamming is short-lived. In most cases, your easy clamming doorway lasts only two to six hours after a storm. The length of time clams are exposed also varies with the type of sand. Clams dig more quickly in softer, almost muddy sand than in harder, more compact sand.

Using Touch

The second way to harvest clams incorporates the sense of touch, using either your feet, hands or both. Using touch to find clams in the hard sandy areas north of Hatteras Island is usually unfruitful; however, the softer bottoms of the southern beaches allow your feet to sink down an inch or two. As you walk or wade along, you can feel the clam's shell under your feet. This type of clamming can be done any time of day, at low or high tide and even in water up to your neck. But some people have more tender feet than others, and shells or debris sometimes litter the bottom. To protect their feet, clam-



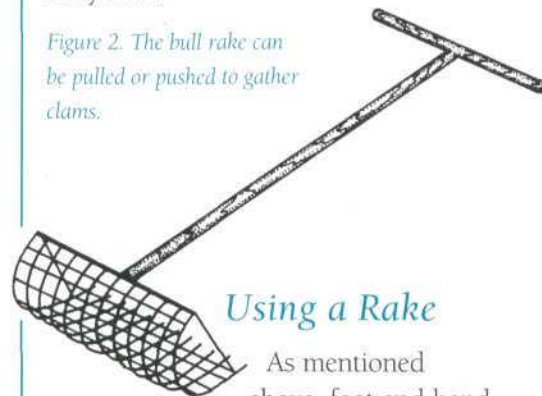
Clamming can be successful at any safe water depth. Here, the clammers pull their harvest in buckets rigged to float.

mers in days gone by wrapped a piece of inner tube from a tire around each foot and tied it on. The soft rubber protected their feet but still enabled them to feel the clam's hard shell in the soft sand. Today, you can purchase rubber footies or aquasocks in beachwear stores if you are tenderfooted or if the bottom where you clam is covered with trash or shells.

In shallow water, many clammers find a clam with their feet and then bend over or kneel to slowly run their fingers through the soft sandy bottom. Often when you find one clam, more will lie close by. When this is the case, you can find all the clams you need in a small area by searching with your feet and hands. More ambitious clammers may float a basket in an inflated inner tube, while others bring a cloth sack or large, heavy-gauge plastic trash bag to hold the clams. The inner tube and basket rig requires at least a foot of

water to float. Pull it behind you as you harvest clams, but it doesn't pull well in very shallow water or on dry shoals. In little or no water, use a sack or trash bag for toting clams. If you plan to gather as many clams as you can up to the legal limit of 100 per person, be sure to use a heavy-gauge trash bag. One hundred clams will make a hefty load.

Figure 2. The bull rake can be pulled or pushed to gather clams.



Using a Rake

As mentioned above, foot and hand clamming is effective only in softer sandy bottoms. On harder, more compact sandy bottoms, a clam rake works



Finding exposed clams like these is rare. Most folks will need a clam pick or some other digging tool to locate their buried treasures.

best. This clamming tool is effective in both hard and soft sand, on dry or wet shoals, and at low or high tide if you can walk in the water. Although dry or water-covered shoals can be raked, it is easier if some water covers the bottom. You can pull the clam rake toward you much like a yard rake or push it away from you as you would a push broom. Most new clammers pull their rakes toward them, as the term "rake" implies. This is effective but much harder than pushing because pulling digs the rake deeper into the sand. Rake areas of the bottom by standing in one spot and turning in a circle. When the rake's teeth strike a clam's shell, you will feel the contact whether you pull or push.

Scanning for Spitting Sign

The fourth way to clam requires a keen eye to scan the sandy bottoms, whether hard or soft. This method is effective only on dry shoals or at low tide when the bottom is covered by no more than a couple inches of water. Many of the inlets and sounds have sandy shoals that may be covered by several feet of water at high tide, but they dry out at low tide. These are excellent places to look for clams. At these times, you can look for the spitting sign. When you see the tiny geysers of water, go to the spot and reach into the sand with your fingers, a stick, a large spoon, a screwdriver or a garden spade. Dig or flip up your clam.



Figure 3. A wooden-handled clam rake has curved prongs and metal webbing to capture clams.

Keyhole Clamming

Signing for clams is a broad term that means looking for several signs made by clams: keyholes, spitting, depressions in the sand, water drop patterns on dry shoals at low tide, small dark spots on light sandy bottoms and beads of clam waste. So, keyholing, signing and gigging are all the same thing: clamming. "Gigging" is a coastal term for checking all of the previously mentioned signs with a fish spear, or gig. Keyhole clamming involves locating the unique holes left in the sand by clams as they

filter water.

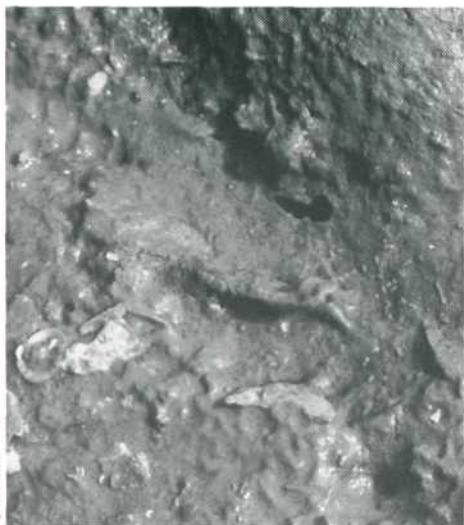
Keyholing for clams does not require any special gear. To spare their hands from sand abrasion, most clambers purchase a three-, four- or five-pronged fish spearhead and attach it to a broom or other handle. A pre-assembled gig costs less than \$10 and will last for many years. Spearheads have one to six points. Single- or double-pointed heads may miss the clam, so most folks use three- to five-pronged spearheads. Also, because the gig is pushed into the sand to pry out the clam, the spear prongs should not be



Figure 4. Spears used to stab the sand to verify a clam's presence usually have handles 4 to 6 feet long with prongs 3 to 5 inches long. The prongs must be strong enough to locate the clam and pry it from the sand.



Some keyholes are accompanied by tiny yellow or orange beads of waste, further indicating that a clam lies beneath the sand.



This keyhole on an oyster mud rock demonstrates the perfect keyhole sign.

so tiny that they bend or break. If you can bend the prongs of the spearhead with your hands, choose a thicker gauge.

When visible, 90 percent of the keyhole signs will have an almost perfect shape; the other 10 percent may be a little distorted. Sometimes the two siphons of the clam will be farther apart than usual. In that case, a tiny line of sand will run between the larger and smaller holes. Less frequently, the two holes may appear as one elongated hole, rounded on both ends with one end a little larger than the other. The tide's rise and fall and water movement caused by wind on the surface also can distort the keyhole.

Because clams range in size from less than 1 inch to 10 inches across their shells, a small clam may create a keyhole only one-quarter inch long. Larger clams may create a keyhole three-quarters inch or longer. With practice and a keen eye, you can learn

to spot even the smallest keyholes.

This type of clamming is more successful in water less than 2 feet deep. It is actually easier in areas where shoals dry out at low tide. In deeper water, wave action and the sun's reflection on the water hinder vision. If you dig the clam with your hand, a stick or a small tool, aim directly under the keyhole. Sometimes you will find what seems a sure clam sign, but there will not be a clam beneath it. Wind, water and other marine life such as tube worms occasionally produce a similar, but false, clam sign. Because of this, most experienced clammers prefer a gig. With this tool, you do not have to bend over to check for a clam. Using the handle of the gig, push the spearhead directly into the keyhole sign. Since the prongs are 4 to 5 inches long, your spear will make contact with the shell if a clam is there. It will stop at contact as if you had struck a rock, and you may even hear a sound like that of metal hitting a rock. When this happens, move the gig over an inch or so and push the spearhead down again. Then push the handle down and away from the clam to lift it from the sand.

Other clam signs are visible only in shallow water or on dry shoals at low tide. The round sunken depression in the otherwise smooth bottom cannot be detected in water deeper than 12 inches. The dark black spots, about 1 inch long, in the lighter sandy bottom may be seen easily if the shoal is dry. However, they may not be visible if covered by water. The moving water will sometimes disperse or wash away the darker sand. Likewise, the tiny yellow or orange beads of clam waste are

very visible on the dry shoals, but this sign may be dispersed when covered with water.

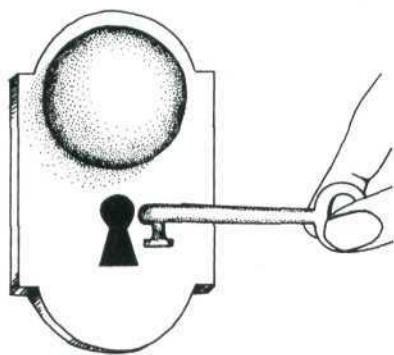


Figure 5. An antique door plate with a hole configured for a skeleton key is the perfect model of the holes formed by a clam's inhalant and exhalant siphons.

Finding the signs is easy — simply walk along and scan for them. If you see a sunken spot, check it with your hand, a tool or a gig. If a clam is present, it will lie in the center of the sunken place just under the sand. The sunken area will measure at least 3 or 4 inches across and up to 10 inches if made by a large clam.

When a clam expels water, it also expels sand pulled in from beneath the surface. Underlying sand is darker than surface sand, so the resulting spot made by the clam expelling water will be dark. The size of the almost round spot will be between that of a half dollar and a silver dollar. Spear in the middle of the spot.

The yellow and orange beads and the water spots in the dry sand must be approached a little differently from the sunken areas and dark spots. The beads of waste may form a line 6 to 10 inches long or a swirling pattern. A gig is handy in this case. Spear both ends

of the line or all through the pattern to locate the clam. The water indentations in the sand made by water droplets from the exhalant siphon will always form a straight line 10 to 15 inches long. Usually a keyhole will also be present. If so, spear the keyhole. If there is no keyhole, spear either end of the line. The clam will always be at one end or the other.

It is not unusual for a single clam to show several signs. A depression in the sandy bottom may also have a keyhole in the center accompanied by clam waste. Water spots made by clams may have a keyhole at one end of their trail. A dark spot may be present in a sunken place. It is not impossible for a depression on a dry shoal also to have a keyhole, water spots, clam waste and a dark spot. With all of these signs, you may even see the clam spit. Naturally with that many clam signs or any combination of them, you know there is a clam at home just beneath the sand.

Conversely, if you go clamming often, you may return to very productive areas and on some occasions see no clam signs. Whatever the reason — wind, tide, temperature — there may be days or times of the day when no clues are visible. The clams are there, but nothing shows to help you locate them. Sometimes signs will begin to show with a tide change, a low pressure front coming through or a shift of wind. Sometimes, just like the day the fish are not biting, you have to wait until another day. If no signs show at all, you can still try to find clams in soft sand by using the touch method or in soft or hard sand using a rake.

Wisdom and Regulations

Recreational clamming is exactly what the name implies — recreation. To ensure that your clamming trip is fun and safe, heed the following cautions:

1. Whether walking or boating to clamming grounds, be aware of the weather forecast. Thunderstorms occur frequently in the spring, summer and fall. Wind, rain and lightning are unpleasant at the least and dangerous at the worst, so go to safety when a storm approaches.

2. When you sunbathe on the beach, you expose one side at a time to the sun. When you swim in the water, you are only partially exposed to the sun. However, when you are clamming, you are totally exposed to the sun for the entire outing. To prevent burning, cover yourself well with sunscreen and light clothing.

3. If you walk to clamming grounds at low tide, you may cross deep sloughs or channels to get to shallow or drier areas. Be sure you can still walk back when the tide comes in and that you will not be stranded by the deeper water.

4. If you go to clamming grounds by boat, anchor your vessel in deeper areas that will not dry out at low tide. Otherwise, low tide will strand you until the tide comes back in.

5. Know the laws:

- There is no season for hard clams in North Carolina; therefore, you can harvest them any time of year. However, some clamming areas may be closed if the water becomes contaminated.
- No license is required for recreational clamming.
- There is a minimum harvest size. Clams must be at least 1 inch thick. Clams under this size must be returned to the sand.
- There is a maximum limit per day:
 - If walking (no vessel), 100 clams per person per day.
 - If boating, 100 clams per person per day, with a 200-clam-per-vessel per-day limit.
- It is against the law to sell clams caught recreationally.

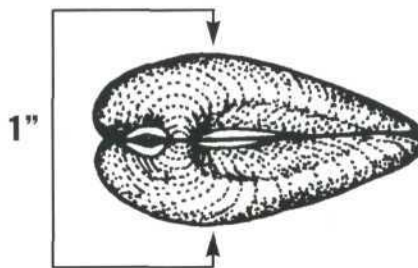


Figure 6. The minimum legal size of clams that can be harvested is 1 inch.

Laws are subject to change. For updates, contact the N.C. Division of Marine Fisheries at 1-800/682-2632.

Enjoying the Harvest

After a day of gathering your own clams, you can enjoy the harvest right away — or save some of the tasty bivalves for future meals.

To ensure freshness and quality, clams with shells broken during harvesting, handling or transporting should be prepared the same day. If that is not possible, remove the clams from the broken shells, place them in a container and refrigerate them up to three or four days. If you plan to eat the clams much later, you must freeze them.

Clams without broken shells may be eaten right away, kept alive in a cool place up to 10 days or frozen. If removed from the shell, clams can be kept frozen for six to eight weeks. However, clams frozen in the shell taste fresh for six to eight months. Clams kept alive may relax the hinge muscles, leaving an opening between the two halves of its shell. When touched, the clam will quickly pull its shell together. If a fresh clam does not close its shell when touched, the clam has died and should be discarded.

The versatile clam can be prepared so many different ways that your taste and imagination are the only limits to how you serve them. The following are just a few of the delicious possibilities:

- raw
- steamed in the shell

- baked in the shell in an oven or on a grill
- boiled in the shell
- removed from the shell and deep fried in batter
- baked on a half shell
- baked on a half shell with cheese or other topping
- baked on a half shell with fried bacon or other meat
- fried in strips
- fried in fritters
- in mixed seafood stew
- in clam stew
- in clam chowder

Long a favorite way of serving clams, chowders are easy and nutritious. The recipes below represent three different styles of chowder making. And for those days when you crave something a little different, a few deviled clams or a clamburger will likely hit the spot.

Down East Clam Chowder

1 quart coarsely chopped clams
1/4 pound salt pork, sliced
1 quart water
1/2 cup chopped onion
1 teaspoon salt
1/4 teaspoon freshly ground black pepper
4 cups diced potatoes
1 cup mashed potatoes for thickening
(optional)

In large saucepan, fry pork over medium heat until crisp. Remove pork and discard. Add clams, water, onion, salt and pepper. Bring to a boil. Reduce heat and cook slowly until clams are tender, about 1 1/2 hours. Add potatoes and onion, and cook until potatoes are done, about 10 minutes. Add mashed potatoes and simmer until thickened, about 5 minutes. Serves 8 to 10.

Manhattan Style Clam Chowder

1 quart coarsely chopped clams
4 bacon strips
2 cups chopped carrots
1 1/2 cups chopped celery
2 cups chopped onion
1/2 cup finely chopped green pepper
1 tablespoon minced garlic
1 teaspoon salt
1/4 teaspoon freshly ground black pepper
1/8 teaspoon cayenne pepper
1 teaspoon thyme leaves
1 bay leaf
1 quart water
1 can tomatoes, chopped and undrained
4 cups diced potatoes
1 cup finely chopped fresh parsley

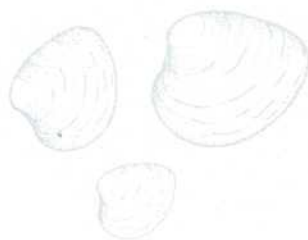
Fry bacon in large pot over medium heat. Remove bacon and save for another use. Add carrots, celery, onion, green pepper and garlic. Sauté lightly. Add salt, black pepper, cayenne, thyme and bay leaf. Add water, tomatoes and clams. Bring to a boil. Reduce heat and cook slowly until clams are tender, about 1 1/2 hours. Add potatoes and cook until done, about 20 minutes. Stir

in parsley just before serving. Serves 8 to 10.

New England Clam Chowder

1/4 pound salt pork, cubed
3 medium onions, chopped
2 large potatoes, peeled and diced
4 cups coarsely chopped fresh clams
2 cups clam liquor
4 cups milk
2 cups medium cream
freshly ground black pepper to taste
3 tablespoons butter
oyster crackers

In a large saucepan, sauté salt pork over low heat. Add onions and sauté until they soften. Add potatoes and water to cover and cook until tender. Add clams and liquor; cook 5 minutes. Add milk and simmer 5 minutes longer. Do not boil. Do not overcook because clams will toughen. When ready to serve, add cream. Heat through but do not boil. Season with pepper. Serve in bowls with a pat of butter and oyster crackers on top.



Deviled Clams

2 cups finely chopped clams
1/2 cup clam liquor
4 tablespoons margarine
2 tablespoons minced onion
2 tablespoons minced green pepper
2 tablespoons minced celery leaves
1/4 cup chopped celery
1/8 teaspoon freshly ground black pepper
1/2 teaspoon prepared mustard
3/4 cup fresh cracker crumbs

Place clams and liquor in medium saucepan and simmer 5 minutes. Melt margarine in small saucepan over medium heat. Cook onion, green pepper, celery leaves, celery, pepper and mustard until vegetables are tender. Add to clam mixture. Stir in crumbs and mix well. Place in greased clam shells or individual serving cups. Bake at 350 degrees for 20 minutes or until crumbs are nicely browned and mixture is bubbly. Serves 6 to 8.

Clamburger

1 cup chopped clams
1 egg, beaten
1 tablespoon fresh lemon juice
1 tablespoon chopped fresh parsley
1 tablespoon grated onion
1/4 teaspoon salt
1/4 teaspoon freshly ground black pepper
1 cup dry bread crumbs
vegetable oil for frying
6 sandwich buns, split and toasted

In medium bowl, combine clams, egg, lemon juice, parsley, onion, salt, pepper and 1/2 cup crumbs. Shape into 6 patties. Roll patties in remaining crumbs. In large skillet, fry cakes in oil over moderate heat, about 350 F, until brown on one side, about 5 minutes. Turn and repeat on other side. Serve in toasted buns. Serves 6.



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