ALASKA Tidelines

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MILLIONS and Millions of . . .

It's early morning in April. The tide is low and the beach is washed clean. Wet rocks gleam. Tide pools sparkle in the spring sun. And here and there an occasional spurt from a tiny hole in the sand lights up like a miniature rainbow. This is clam country.

Where?

Almost anywhere along Alaska's thousands of miles of shoreline and shallow subtidal regions.

What kinds of clams?

Razor clams. Butter clams. Little-necks. Soft-shells. Pinknecks (sometimes called surf clams). Alaska has more than 160 different species of clams, and you can just about take your pick.

How many are there?

So many millions we really don't know. Until recently the best guess was that some 50 million pounds of Alaska clams could be taken each year without being missed. And that isn't counting the huge new surf clam fishery in the Southeast Bering Sea which we're just beginning to find out about.

How much are they worth?

Millions and millions of dollars.

Who's harvesting them?

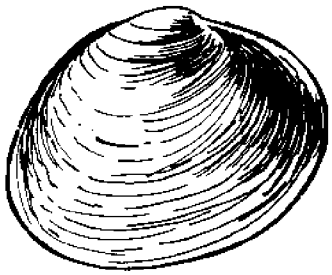
You are — and other diggers like you — with a bucket and shovel.

Nobody else?

Nobody. Not yet, anyway. But . . . ➡

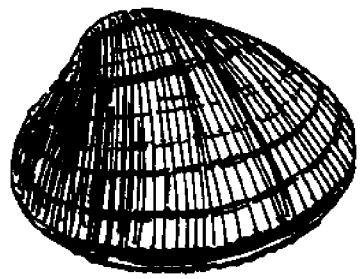
From: Fish Tales & Game Trails, Sept./Oct., 1978 Alaska Department of Fish and Game

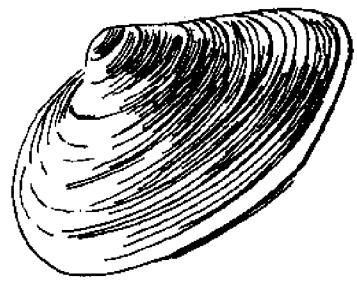
CLAMS



BUTTER CLAM: Size up to 4". Very plentiful, Southeast through Aleutians.

LITTLE-NECK: Up to 1½". Dense beds found from Southeast to Southcentral.





SOFT-SHELL: Up to 2". Common on all coasts, including the Arctic.

Alaska is so rich in fishery resources — salmon, crab, shrimp, halibut and other bottomfish — that perhaps it's not surprising most of our clams still lie hidden beneath our beaches like money in the bank.

Many of those clams, such as the "Big 5" pictured above, have high commercial value. Together, they make up one of the greatest untapped fisheries left in the United States today. And since nationwide demand for clams is going up while pollution and overfishing are cutting into supplies, maybe the time has come to start cashing in on Alaska's clams.

But before we do, there are problems to be solved – problems that have held up the development of commercial clamming in Alaska from the very beginning. Let's take a look at . . .

. . . WHAT'S HAPPENED SO FAR

Alaskans have been digging clams just about as long as they have been catching salmon. In the early 1900s, butter clams were canned in Southeast Alaska as an off-season product after the salmon runs were over. But the clam industry didn't really come into its own until 1916 when two big canneries were built in Cordova to process the area's abundant supply of razor clams.

That first commercial Alaska harvest of over five million pounds made the new industry look like a winner. But over the next ten years, clam production shot up and down like a yo-yo *(see page 4)*.

Cordova's clam beds were dug out. New ones were found on Cook Inlet, Kodiak and the Alaska Peninsula — only to be exhausted in turn. Lack of proper management was hurting both the clams and the industry. And it wasn't until seasons, quotas, and size limits were set that the market finally leveled off in the mid-1930s.

At that time, however, Alaska was producing more than half the entire Pacific Coast pack of razor clams, traditionally the No. 1 species in the West. The original butter clam fishery of Southeast Alaska was picking up, too. During World War II, when meat shortages led to an increased demand for fish, five good-sized canneries were in operation.

Then in 1946, commercial clamming in Alaska suffered a major blow. Traces of Paralytic Shellfish Poisoning (PSP) *(see page 5)* were found in some of the butter clams, closing the hardshell industry down for good. Although PSP had never been a problem with razor clams, the fact that the poison could appear without warning among Alaska's smaller clams made people wary of all species. And the PSP scare came at a time when the razor clam industry had troubles enough.

High transportation costs and competition from big clam dredge operations on the East Coast had just about knocked Alaska's hand-dug razors from the canned clam market. To make matters worse, shipments of fresh and frozen clams were halted in 1954 when Alaska was dropped from the National Shellfish Sanitation Program because of its PSP problems.

The razor clam industry managed to stay alive by selling whole clams for Dungeness crab bait. But when land shifts during the 1964 earthquake left many prime Prince William Sound clam beds high and dry, commercial clamming in Alaska just about hit bottom.

Although Alaska has since been readmitted to the NSSP, the terms are strict. Only three beaches have been certified as "safe" for commercial harvesting *(see page 6)*, and so far only razor clams may be taken. But at least it's a start. If the state proves it can live within NSSP requirements, some hardshell clams might soon be accepted under the system. And that is very important because of . . .

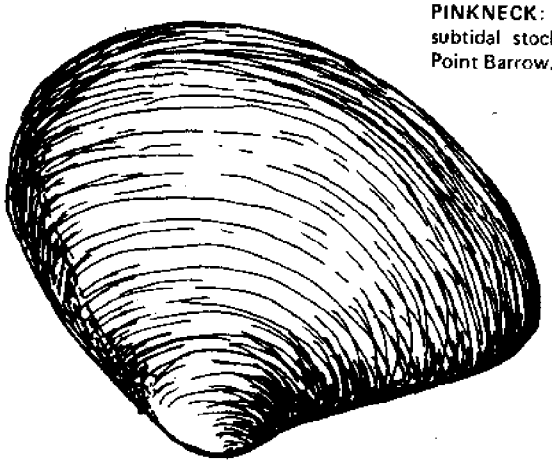
. . . WHAT'S HAPPENING NOW

About one-third of the world's clam catch comes from the United States. Only Japan produces more — largely through mariculture, or farming clams in the sea *(see* **Tidelines,** *September, 1978)*.

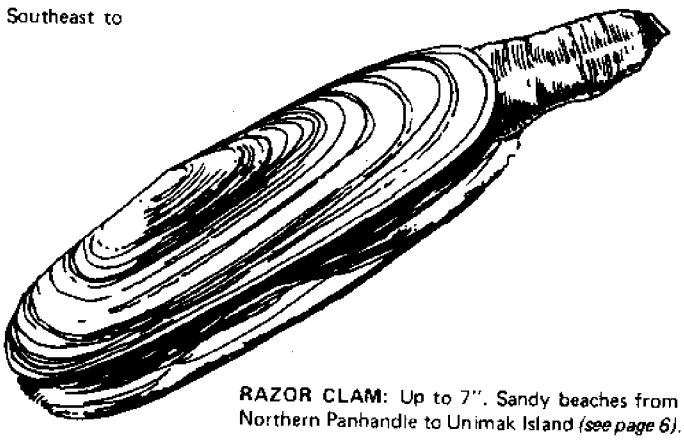
By far the most important U.S. species is the big Atlantic surf clam, which is dredged up off the East Coast from New York to Virginia. This is the clam you usually find in canned clam products, like chowder, or frozen in strips for deep frying.

In 1974, when the U.S. harvest hit an all-time high of 120 million pounds of clam meat, surf clams made up 80 percent of the take. But since then, as clam beds were closed because of pollution from big cities and heavy fishing shifted to other areas, the surf clam catch has dropped dramatically.

From the peak of 96 million pounds in 1974, landings fell by more than half to 45 million pounds in 1976, and to 30 million pounds in 1978, when quotas were applied to keep



PINKNECK: Up to 5". Tidal and subtidal stocks from Southeast to Point Barrow.



RAZOR CLAM: Up to 7". Sandy beaches from Northern Panhandle to Unimak Island *(see page 6)*.

stocks from being wiped out entirely.

That sent food processors on an all-out search for other sources of clam supply. Guess where they've been looking and . . .

. . . WHAT MIGHT HAPPEN NEXT

Alaska doesn't have a clam exactly like the surf clam *(Spisula solidissima)*. But the pinkneck clam *(Spisula polynyma)* is a very close cousin — and Alaska has *that* in very great quantities, particularly on the Bering Sea side of the Alaska Peninsula. Would the pinkneck serve as a substitute for the surf?

To find out, some of the nation's major food processors sponsored survey cruises into the southeastern Bering Sea during the summers of 1977 and 1978, in cooperation with federal and state agencies. Results of those surveys were recently revealed in a report issued by the National Marine Fishery Service (NMFS) which directed research plans and operations. The report makes pretty exciting reading for an industry that has had as many woes as Alaska's commercial clam fishery.

Here are the highlights of what it said:

- There are enough stocks of pinkneck clams in a 2,000-square-mile offshore area between Port Moller and Ugashik Bay to create a major new fishery.
- These stocks, estimated at 300,000 metric tons (660 million pounds) of mature pinknecks, could yield from 19 to 25 million pounds of *meat* a year.
- PSP apparently is *not* a problem. Extensive testing showed traces of toxin (poison), but all were below the level allowed by federal food and drug regulations.
- Processors ran the pinkneck clams through the automatic shucking and cleaning equipment designed for surf clams — and everything worked just fine.
- While the Bering Sea clams are smaller than the East Coast surf, they yield more meat because their shells are thinner. The meat was found to be firm, and the flavor excellent.

"It's large and good. It's a first class clam!" Steven Hughes, chief scientist for the surveys and co-author of the report, told *Tidelines*.

While it appears Alaska's clams might finally hit the big time, much remains to be done. This summer further studies will be made on gear efficiency and processing possibilities. Tests for PSP will continue to make sure the clams will be acceptable under NSSP rules. And perhaps most important, a sound management plan will be developed so that this bountiful new resource is used wisely, and that over-fishing mistakes of the past are never made again.

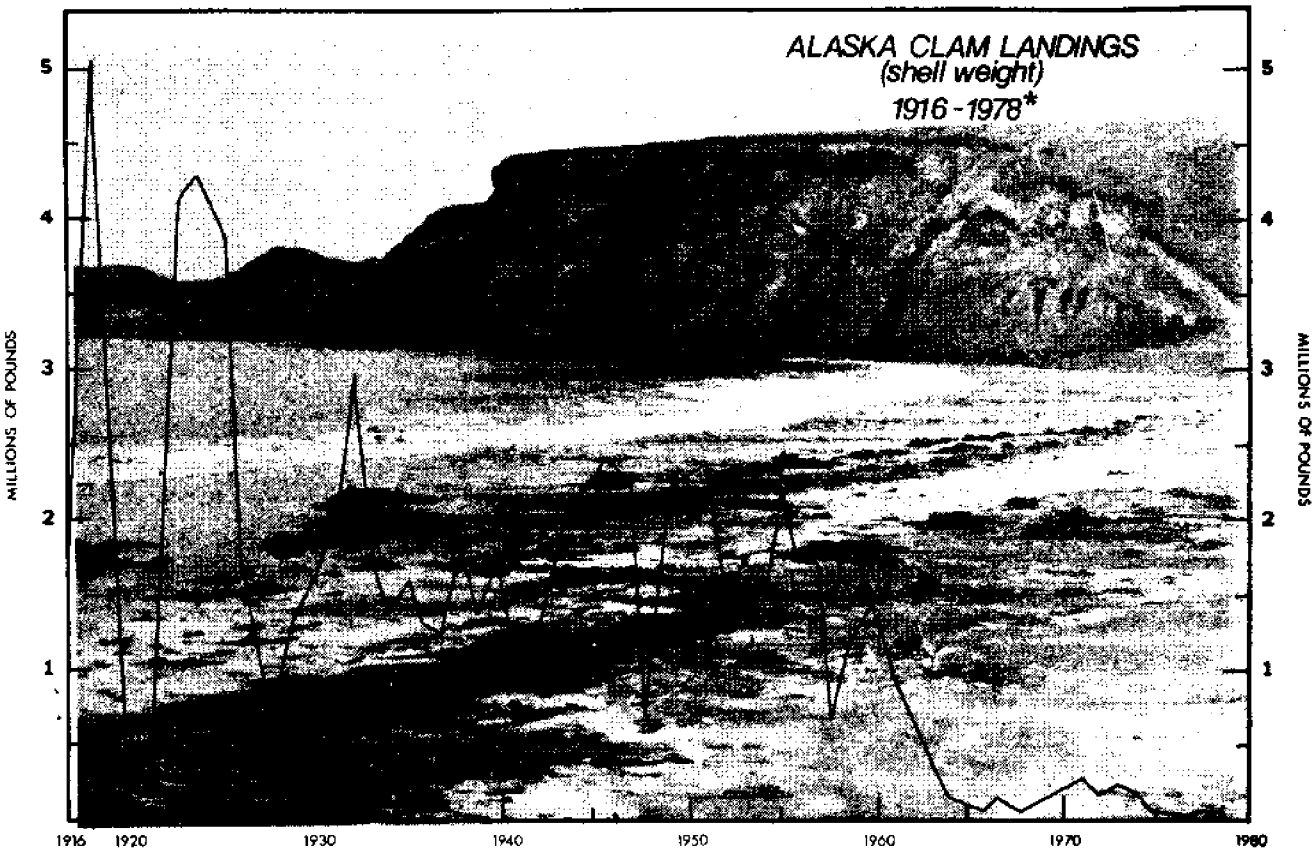
READ ON:

"Distribution, Abundance, Quality and Production Fishing Studies on the Surf Clam *(Spisula polynyma)* in the S.E. Bering Sea — 1978," by Steven E. Hughes and Richard W. Nelson, Northwest & Alaska Fisheries Center (NMFS), Seattle.

"The Alaska Clam Fishery: A Survey and Analysis of Economic Potential," by Franklin L. Orth, Charles Smelcer, Howard M. Feder, and John Williams. Sea Grant Report No. 75-5, University of Alaska, Fairbanks.

Scientists on the decks of the F/V **Smaragd** *check pinkneck clams dredged from the Southeastern Bering Sea during a 1977 survey cruise.*

(Photo by Richard Neve)



(Photo by R. Arend, AEIDC)

Want to Get In . . .

ON THE GROUND FLOOR??

Graphs are like picture stories. If you know how to read them, you can get a lot of information almost at a glance.

Say you are interested in starting a commercial clam operation of your own. Not a big deal like the Bering Sea offshore fishery, but a small one on the beach. You think the PSP problem will be solved soon. And you think that now is the time to get in on a fishery that some day will be worth a lot of money.

What does this graph tell you?

1. The figures along the sides of the graph show the number of pounds of clams landed each year in:

_____ thousands.
_____ millions.
_____ bushels.

2. The first big razor clam harvest at Cordova pushed Alaska's total catch in 1916 to more than 5, _____ (you add the right number of zeroes).

3. As the beds around Cordova were dug out, landings dropped to less than half a million pounds in 1920 and under a quarter of a million in _____.

4. With proper management, the market began to level off. There were good years and bad years, of course. But from 1935 to 1960, total landings averaged:

_____ between 2,000,000 and 3,000,000 pounds.
_____ between 1,000,000 and 2,000,000.
_____ under 1,000,000 pounds.

5. The whole industry suffered after traces of PSP were found in the canned butter clam pack in 1946. The following year, only about _____ were taken.

6. In recent years the industry has been in a slump. Clam landings in Alaska have not totaled more than half a million pounds since _____.

7. The worst five year period for clam landings since 1916 was between _____ and _____.

(But if you do get in on the ground floor, be sure to push the UP button.)

*Sources: U.S. Department of Interior, 1916-28, 1942-59; Pacific Fishermen Yearbook, 1929-41; Alaska Department of Fish and Game, 1960-1978.

Career Corner

Chemical Key to PSP?

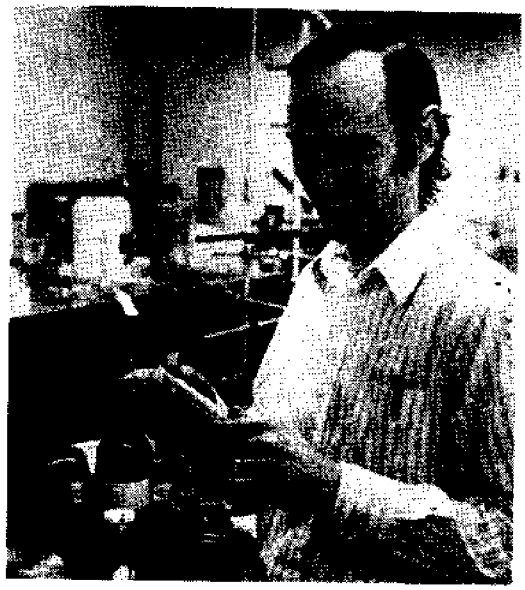


Photo by Sabra McCracken

Chemist Paul Reichardt was born and raised in the Midwest, far from ocean beaches. Until he came to Alaska in 1972, the only clams he'd ever encountered were in chowder. Since then, however, he's handled more clams than he cares to think about, trying to find a chemical key that will unlock the Paralytic Shellfish Poisoning (PSP) puzzle.

The poison involved comes from one of the many tiny one-celled organisms called *dinoflagellates* (DIE-no "spinning" + FLA-ju-late "whip"). These organisms are so small they can swim around between grains of sand. Clams eat by pumping water through their gills which filter out the food. If the PSP toxin (poison) is present, it can be stored in the clam's syphon or digestive system for a surprisingly long time.

The toxin doesn't bother the clam — or even fish that might feed on the clam. But it is highly poisonous to warm-blooded creatures. A small amount can kill a human being, and there is no known remedy.

The history of PSP poisoning in Alaska goes all the way back to the days of Russian America, when more than 100 Aleut hunters under Baranov's command died after feasting on shellfish off Peril Strait near Sitka. Only seven other PSP deaths have been reported since then. But in 1947 when PSP was found in a canned butter clam product from Southeast Alaska, the industry collapsed and never really recovered.

While PSP is found in other parts of the world, it can be kept under control by regular checks of established clam beds. But with Alaska's clam resources strung along thousands of miles of shoreline, monitoring is almost impossible. And the problem is further complicated by the fact that the only accepted method of testing for PSP levels is to shoot clam extract into laboratory mice and see how they react — a long and tricky process.

Clearly, what has been needed is a quick easy test for PSP that can be made on the spot — in a boat or on the beach. But as Paul and other scientists working on the project can tell you, the search for such a test has been anything but simple. And after six solid years of research, they have just reached what they consider a major breakthrough.

While they have found that more than one toxin can cause PSP, they have managed to single out the dinoflagellate that is responsible. And most important, they discovered that the culprit carrier spends the early part of its life as a *cyst* (rather like a tiny soft-shelled egg) in the mud and silt. Only later does it hatch and swim freely. That means that when the organism is found in its resting stage, officials will know ahead of time if a beach is apt to have PSP problems.

So instead of spending this summer at Porpoise Island or Bartlett Cove or Tenakee Springs in Southeast Alaska, Paul and his associates will be in the lab at the University of Alaska working over the cyst-laden sediment they dredged up last year — growing cultures, classifying, analyzing. That doesn't sound like nearly as much fun as a summer on the beach. But if they succeed in solving the PSP problem, it will make Alaska's beaches safer and more productive for everyone.

WARNING

You can't see, smell or taste the poison that causes PSP. All clams and mussels are possible carriers. However, the poison is usually heaviest in the dark portions of the clam (neck and stomach). Thus razor clams usually are safe if only the white meat is eaten.

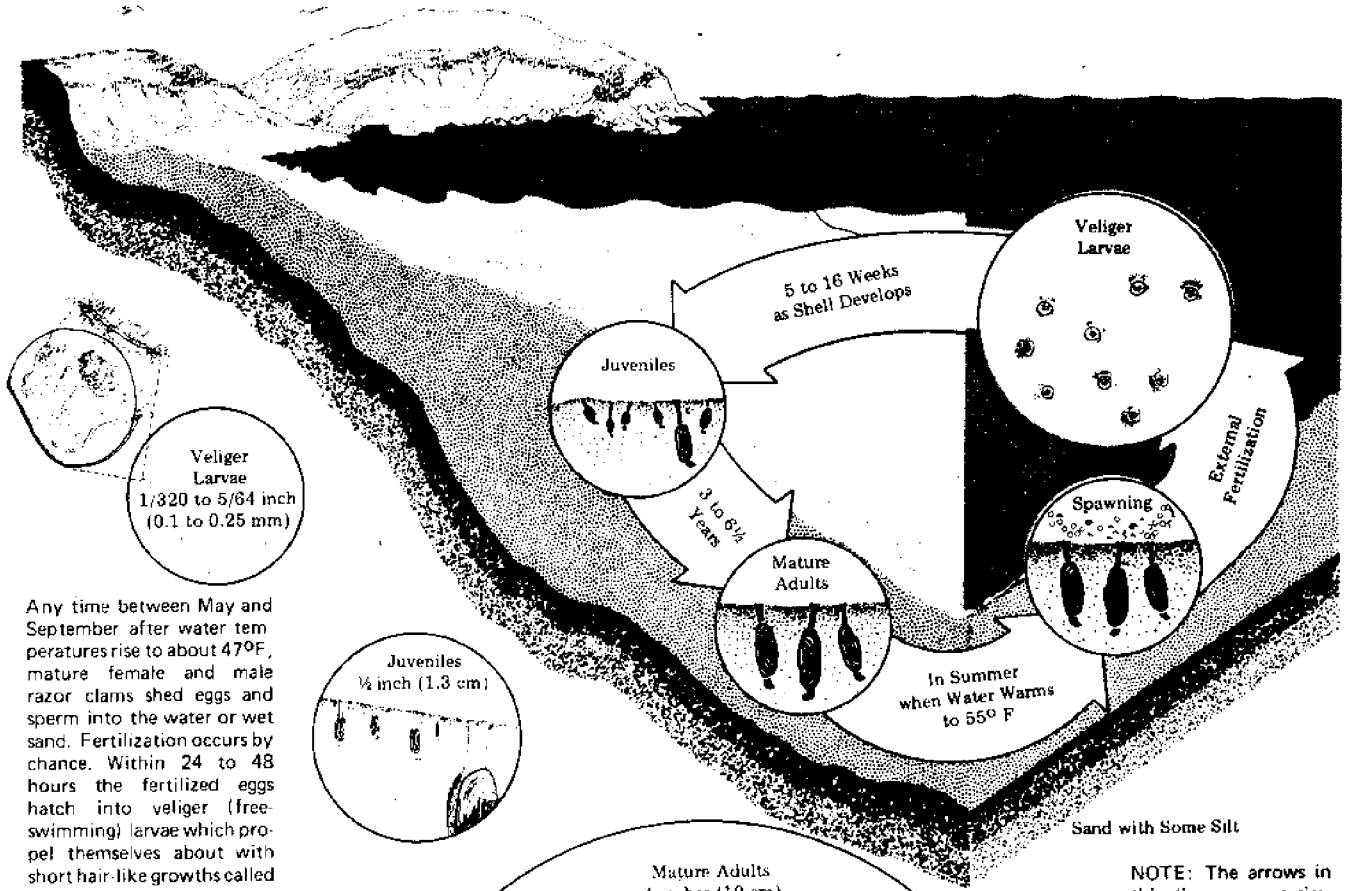
Signs of Poisoning:

Symptoms may begin within 30 minutes after eating. They include: (1) a tingling sensation or numbness in the tongue and around the lips, spreading gradually to the face and neck; (2) a prickly feeling in the fingers and toes; (3) headache, dizziness and nausea. In severe cases, limbs stiffen and lose coordination, pulse rate increases, speech and breathing become difficult. Complete muscular paralysis may follow, and death occurs because of respiratory (breathing) failure.

What to Do:

Vomiting should be brought about as quickly as possible to empty the stomach. A fast-acting laxative should be given. Do NOT give a stimulant (such as alcohol) which speeds absorbtion into the digestive system. Keep victim lying flat and comfortable. Give artificial respiration if breathing becomes difficult. If the patient survives for 12 hours, chances of recovery are good.

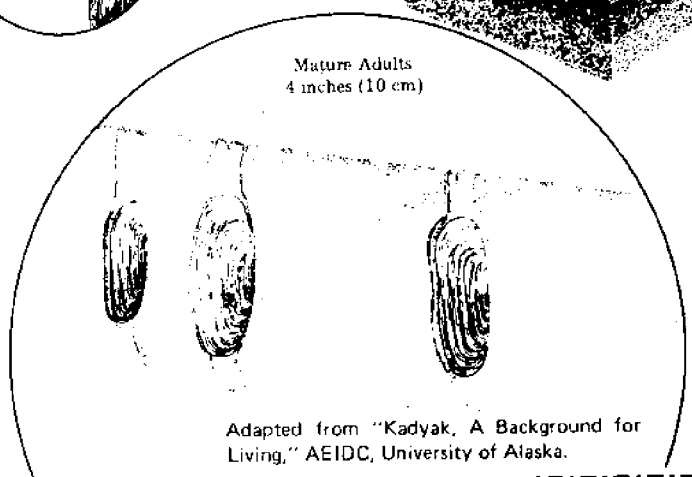
RAZOR CLAM LIFE HISTORY



Any time between May and September after water temperatures rise to about 47°F, mature female and male razor clams shed eggs and sperm into the water or wet sand. Fertilization occurs by chance. Within 24 to 48 hours the fertilized eggs hatch into veliger (free-swimming) larvae which propel themselves about with short hair-like growths called cilia.

Shells begin to form 5-16 weeks later. The young settle to the bottom and begin to dig into the sand. They grow slowly during the fall and winter months, and rapidly during the spring and summer when the weather warms up and the food supply increases.

Adult razor clams reach a harvestable size of 4 inches in 3-6 years (growth rates vary from area to area) and may grow as big as 7 inches. They feed by filtering tiny plants and animal life from the water. Razor clams have been known to live to the age of 18.

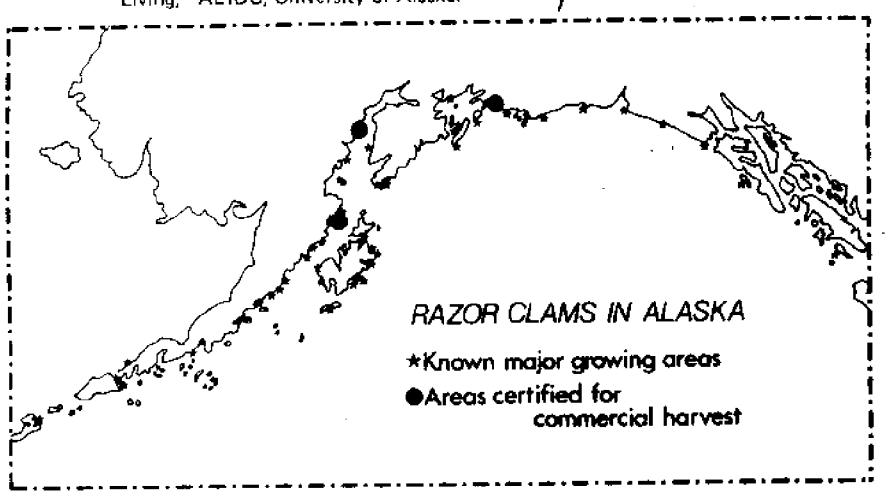


Adapted from "Kadyak, A Background for Living," AEIDC, University of Alaska.

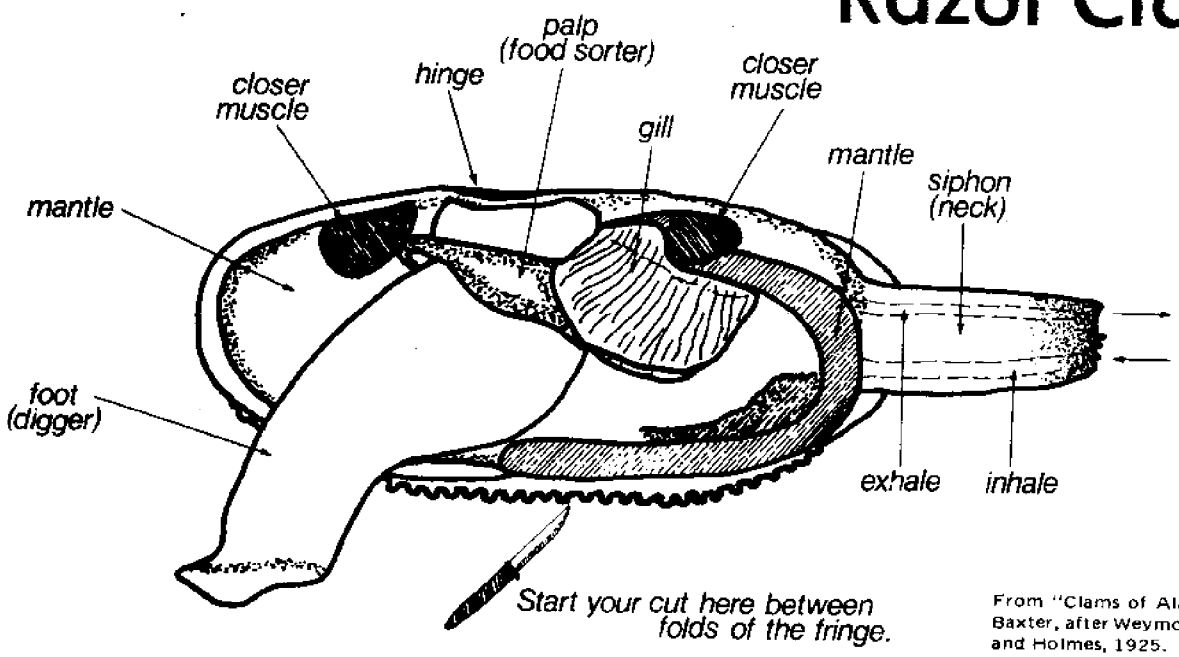
NOTE: The arrows in this diagram serve simply to direct you to the next life cycle stage, and do not mean that clams change their location. They do not move horizontally except as larvae or as very young juveniles settling into the sand. However, they do move up and down very rapidly between deep sand and the surface by extending and contracting their "foot."

The razor clam's scientific name is from the Latin: **Siliqua** *(SILL-ee-qua) meaning "pod" plus* **patula** *(PAT-you-la) meaning "open." That is because* **Siliqua patula** *is so fat its thin sharp shell doesn't quite close. Razor clams live on wind-swept and somewhat protected beaches of the open ocean. They are found from about 4 feet above mean low water level down to depths of about 30 fathoms.*

Adapted from "Razor Clam," by Richard B. Nickerson, Alaska Department of Fish and Game Notebook Series.



How to Dig, Clean & Cook Razor Clams



From "Clams of Alaska," by Rae Baxter, after Weymouth, McMillan and Holmes, 1925.

Digging razor clams sounds easy. All you need is a shovel, gunny sack and (if you are over 16) a sports fishing license in your pocket. But there are those who have left the beach looking like a pock-marked moonscape after two frantic hours of digging with only a couple of crunched clams to show for it. Obviously, there are some tricks involved. So here are some tips for the beginning digger, cleaner, and cooker.

DIGGING:

Clams may be legally dug at any time throughout the year. Check your Tide Table for a minus tide (*see* **Tidelines**, *November, 1978, issue).* It should be at least minus one or two feet (-1.0 or -2.0), but the lower the better. The best digging time is usually an hour before to two hours after the low tide.

Clams are located by the "show" they leave when they withdraw their siphons. This show looks like a little dimple or shimmering spot in the sand, or a hole about the size of a pencil. If you don't see any signs, walk slowly along the beach and tap the wet sand with your shovel or your foot. This may cause the clam to pull in its siphon and start down, leaving a show which quickly fills with water and wet sand. You must work very fast.

Push your shovel straight down into the sand about three to six inches on the seaward side of the show. (Any shovel will do, but specially designed clam shovels with narrow blades are best.) Remove the sand with a lifting motion. Don't pry back on the handle toward the show or you're apt to smash the clam. Reach down and feel around in the wet sand for the clam. Squeeze the tip of its shell and pull up with a strong steady motion.

Bag limits vary from area to area, so check with the Sport Fish Division of the Alaska Department of Fish and Game. Take only the number of clams you need – but keep all you dig. There is no size limit, because once a clam is dug its chances of survival are poor.

CLEANING:

You may remove the clam from its shell by running a knife along the inner shell and cutting the "closer" muscles. But the easiest way to shell a lot of clams in a hurry is the boiling water method. Place the clams in a large bucket or washtub. Pour boiling water over them and stir *very quickly* (for just a few seconds) with a piece of kindling or a large spoon. Pour off the hot water and immediately splash a bucket of cold water over the clams. The shells will pull away easily, and the clams will be less slimy and easier to handle.

Now, with a sharp knife or small pointed scissors, remove all the dark parts:

1. Cut off the black tip of the siphon.

2. Run your knife between the fringed edges of the mantle *(see sketch)* up through both ducts of the siphon and split it so that it lies flat.

3. Cut away the gills, palp and other gut material.

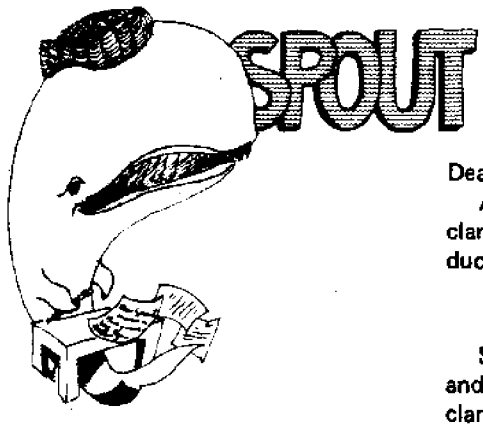
4. Pull the foot loose. Cut off the gut and slit the fat side of the foot part way up so that the little black or brown intestines can be removed.

5. Your cleaned clam will be in two pieces: (1) the split siphon and the rest of the body meat, and (2) the slit digger. All of the cleaned clam should be white meat, with no dark portions remaining. Wash off well in clean cold water.

COOKING:

When razor clams are fresh, enthusiasts insist there is only one way to cook them. Lightly flour the clam steaks. Dip in beaten eggs and roll in cracker crumbs. Fry very fast in hot oil for one or two minutes on each side (no more, or they will get tough). Serve hot right out of the skillet.

Fresh clam steaks will keep in the refrigerator for a couple of days. But when you have eaten all you want (and that will be a lot), grind up the rest and freeze them for clam patties, fritters or chowder.



This column is your place to spout off with questions about Alaska's water world, jokes, recipes, fish stories, whatever. Send them to Spout, c/o *Alaska Tidelines* at the address below. Include your name and address (he won't print your name if you ask him not to) so your questions can be answered by mail if there isn't room in this column.

Dear Spout,

A friend told me there's a huge clam found around here called a gooey duck. Is she kidding?

(unsigned)
Ketchikan

She's not kidding. But it isn't gooey and, of course, it isn't a duck. The clam is a geoduck (actually a better pronunciation is GWEE-duck). The name comes from Northwest Indian words meaning "dig deep."

And it's huge, all right. It's larger than any other clam in the world except the giant East Indies clam. While geoducks average around three pounds, a Ketchikan diver got one last year that weighed over 12 pounds, and they've been found up to 20 pounds in Washington State's Puget Sound. They have large fat siphons (necks) which, even when contracted, can be twice as long as their shells.

There is a growing commercial geoduck fishery in the Puget Sound area which harvested five million pounds last year. Major stock also have been located in Southeast Alaska.

The clam has an excellent flavor. It's neck is usually used in chowder, and the body meat is served in fancy restaurants as "King Clam Steaks" (which sounds a lot better than asking your waiter for a "gooey duck").

Spout

P.S. And speaking of "ducks," the May issue of *Tidelines* will welcome back our migratory waterfowl to their nesting grounds in Alaska.

Answers to graph questions: 1—millions. 2—5,000,000. 3-1921. 4—1,000,000 to 2,000,000. 5—750,000 pounds. 6—1963. 7—1973-1978.

CLAMMING UP

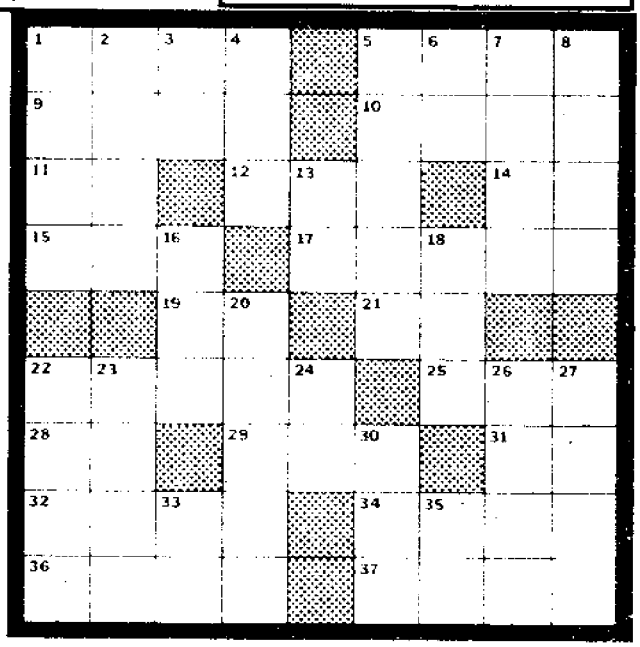
Starred (*) words are based on information in this issue.

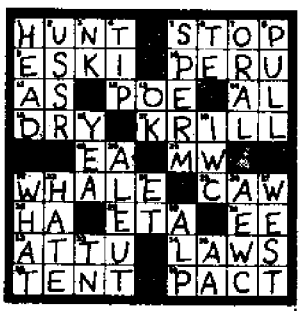
ACROSS

*1. Discovery of large stocks of ____ neck clams in the Southeast Bering Sea could mean a major new fishery for Alaska.
*5. Alaska's ____ resource is one of the largest undeveloped fisheries in the United States today.
*9. So far, under the National Shellfish Sanitation Program, only three clam beaches in Alaska have been certified as ____ for commercial digging.
10. Girl's name.
11. Social Security (abbr.).
12. ____ whiz!
14. Spanish for "yes."
15. Parent-Teachers' Association (init.).
*17. For many years the most important species in Alaska's commercial clam fishery has been the ____ clam.
*19. In the mid-1930s, Alaska was producing more than half the West Coast's ____ (abbr.) of (17 across).
21. North America (abbr.).
*22. The scientific word for "poison," such as that found in PSP.
*25. The razor clam's first name in Latin — "Siliqua" — means ____ in English.
28. Identification (abbr.), as in ____ card.
29. Negative.
31. Dear old dad.
32. To shape, as with clay.
*34. When digging razor clams, don't start your hole directly ____ the show or you're apt to smash the clam.
36. To make a mistake or error.
*37. As you would guess from its name, there are traces of ____ on (1 across).

DOWN

*1. The program that does the regulating in (9 across).(init.)
*2. Pollution and overfishing have caused a sharp drop in the commercial clam harvest off the ____ coast.
3. Cold fish (init.).
4. A small barrel.
*5. Before you go after razor clams, you should know how to dig, ____ and cook them.
6. Short for (10 across).
7. In addition to, or likewise.
8. Scottish explorer and naturalist, who traveled in Alaska in the late 1800s, John ____.
13. First two letters of (36 across)
16. Army Post Exchange (abbr.).
*18. If scientists could ____ the PSP problem, many of Alaska's hardshell clam species could be developed commercially.
*20. About 160 different ____ of clams are found in Alaska.
*22. You check your Tide Table to find the ____ of the low clam tides.
*23. PSP has neither taste nor ____.
24. Not yes, but ____.
*26. The razor clam's last name in Latin — "patula" — means ____ in English.
*27. After you've cleaned your razor clam, all the ____ meat should be gone.
*30. A little "dimple," shimmering spot, or hole on ____ of the sand may mean a clam is down below.
33. "Hi ho Silver! The ____ (init.) rides again!"
35. Six (in Roman numerals).





March X-Word Answers

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