

Additional Information

Reflections on a First Nations Midden, by archaeologist Kim Kornbacher

The “garbage dump” idea came with the word origin. Midden is from a Danish word that means garbage. But *you are right* to be uncomfortable with that comparison. Not only does it fail to convey any value, it is inaccurate.

In this part of the world, most middens are living surfaces. Accumulation of shell may initially occur in a refuse area, but over time these deposits were “lived” upon and incorporated into the daily activities and became locations that people used for other purposes. For example, one way we can identify long-decayed wooden houses in the archaeological record is by the u-shaped deposits of shell that still remain from people dumping the shell and other debris outside around the walls of the houses. When the houses decay, the shell ridges remain. But if you look at such deposits in cross section, they are usually part of a larger series of shell-bearing deposits underneath. Within those deposits are all kinds of living features, such as hearths, burials, cooking pits, storage pits, AND other house floors!

Also, there is no doubt that Native people were aware of the excellent drainage properties of crushed shell and used it intentionally in that capacity. Large accumulations of shell change soil chemistry. As shells decompose and calcium carbonate is added to the soil, the soil becomes less acidic contributing to the preservation of bone and other shell that would normally decompose. This may be one reason people buried people in middens for many centuries. So I would want to get across to the instructors that on the Northwest Coast middens tend to be complex structures that retain information about the lives of people who lived before. They are in many cases our ONLY record of past lives. Midden sites may be villages, special purpose sites, and ceremonial sites. They may reflect a short-term specialized occupation or they may be deposited over thousands of years and represent the entire spectrum of activities of a population.

“Garbage dump” just doesn’t cut it!! I don’t know how much time is being planned for archaeology, but let me know if you need materials or anything. Good luck! Kim

Bamfield Marine Science Centre Beach Seining Practices

Purpose:

Describes the procedure used to catch and transport fish from a beach seine site to BMSC with the least mortality possible,

Policy:

This method is recommended for the collection and transport of fish caught by beach seine.

Responsibility:

Public education assistants, animal care specialist, researchers, and university programs students

Materials:

- ✧ Beach seine net
- ✧ 2 ropes
- ✧ Dip nets
- ✧ Buckets
- ✧ Hip waders

Procedures:

Note: Many delicate species are found in beach seine (eelgrass bed) sites. These sites are nursery areas for many species of fish. In the spring, great care must be taken not to impact salmon smolts (This means immediate release with no loss of scales).

1. Person A will stay on the beach with one end of the seine net. The other end of the net remains in the boat and the driver brings the boat from the point A where person A is on the beach, out and around, in a semi circle to a point B, 30 ft up the beach, to person B. (If the tide is low enough, this can also be done without a boat by persons in hip waders)
2. The seine net is then slowly pulled in by persons A and B until the net is up on the shore. While pulling the net in, be sure the weighted side of the net drags along the bottom and the float side of the net stays at the surface.
3. Several buckets of clean water should be filled prior to seining. Often the seine will stir up sediment, and making it difficult to fill buckets with clear water. If there are enough people present, someone should be assigned to ensure the buckets are ready and to immediately begin to recover fish once the net is brought in.

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4. Fish should immediately be put into buckets. A small amount of seaweed should be added to the bucket to give the fish a feel of safety (cover). This will help in recuperation. Any by-catch should immediately be released. If the by catch appears to be injured or disoriented give it time to recover (5-10 minutes) in a bucket of cold seawater. Be very careful not to disrupt slime layer or scales of fish through handling.

Some Species Found in Eel Grass Meadow and Their Adaptations

1. **SCULPINS** (40 species live in the Pacific Northwest) – Have broad flat heads and slender tapering bodies.

ADAPTATION: rely on their body colours and patterns for camouflage and often will not move unless threatened.

EXAMPLE: Great Sculpin (*Myoxocephalus polyacanthocephalus*) – Adults have reddish orange eyes.

FACT: the Latin name means *Myoxos* = dormouse, *poly/antho/cephalus* = many/spines/on head

2. **PERCHES** (23 species of perches)

ADAPTATION: rather than release or deposit huge numbers of eggs (many of which do not survive to adulthood), the surfperches give birth to relatively small numbers of well to fully developed young

EXAMPLE: Shiner Perch (*Cymatogaster aggregate*) travel in large schools so that they look like light shimmering in the water. They have small silvery bodies, oval and compressed with large scales. Strong dark bars along the sides, interrupted by 3 light yellow vertical bars (to 15cm).

3. GOBY

ADAPTATIONS: bold markings to defend territory.

EXAMPLE: Black-eyed Goby (*Coryphopterus nicholsi*) has black eyes, black patch at top of forward dorsal fin. Pale to dark tan-orange body with large scales. Rounded tail fin. Males have black pelvic fins in breeding season. To 15cm. They live in rock rubble on sand-mud and are aggressively territorial.

4. PLAINFISH MIDSHIPMAN

ADAPTATION: single spine on gill cover is mildly venomous. Are dark grey brown to camouflage with mud (though also have iridescent purple rows with white spots. Large head and mouth).

EXAMPLE: Plainfish Midshipman (*Porichthys notats*) live on sand and mud bottoms and have the adaptations noted above. FACT: They are called the singing fish because of loud grunting noises made by males as they use muscles on the swim bladder. The common name 'midshipman' is from rows of organs, resembling brassbuttons on early naval uniforms.

5. FLOUNDERS (over 100 species of flounder)

ADAPTATION: The flounder has a flattened body with both its eyes on the right side of the head. This is an adaptation to living on the ocean bottom.

EXAMPLE: C-O Sole lives in sandy patches near rocks, in eelgrass beds. The large dark spot on the centre of back resembles the letters CO. Large prominent eyes, high side (dorsal and anal) fins. FACT: Flounder fossils dating back to at least 50 million years have been found.

6. BAY PIPEFISH

ADAPTATION: long, thin body is well camouflaged in eelgrass – observers rarely see them unless the fish are swimming away from vegetation.

EXAMPLE: Bay Pipefish lives in eel grass beds in bays, elongated body to 14 inches with long snout and small mouth, covered with body plates. FACT: The female deposits the eggs in the brood pouch of the male.

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Key to the Clams of Burgoyne bay

1. Overall Shape of shell	1a) Shell is oval or tear-drop. Inside of shell has two muscle scars.	Go to 2
	1b) Shell is irregular in outline. Outer surface is chalky white, rough and uneven. Inside is smooth and pearly, only one muscle scar.	Giant Pacific Oyster (Introduced)
2. Colour of outer surface of shell	2a) Outer surface of shell is black or blue-black .	Mussel
	2b) Outer surface is white, creamy, brown or greenish.	Go to 3
3. Colour of Inner surface	3a) Inner surface of shell has some purple .	Go to 4
	3b) Inner surface of shell is white or creamy .	Go to 5
4. Features of shells with some purple on inside	4a) Outer surface has a green-brown varnish-like layer , which may be peeling. Inside of shell is mostly purple.	Varnish Clam (Introduced)
	4b) Outer surface does not have varnish-like layer , and has light radial ribs. Inner surface with patch of purple on one end.	Manilla Clam (Introduced)
5. Shape of shell looking from the top	5a) Shell has a 'bend' and is thin.	Bent-Nose Clam (Native)
	5b) Shell has no 'bend' and is more rounded.	Go to 6
6. Compression cup inside the shell at the top?	6a) The shell has a spoon-like cup at the top edge.	Go to 7
	6b) The shell has no spoon-like cup at the top edge.	Go to 8
7. Shell with cup inside for 'compression bung'	7a) The spoon-shaped compression cup sticks straight out into the shell cavity.	Soft Shell Clam (Introduced)
	7b) The spoon-shaped compression cup is flat with the inside front of the shell . This clam also has a conspicuous 'gap' where the siphons stick out when the two shells are together.	Horse Clam (Native)
8. Does the shell have radial ridges?	8a) The shell has ridges running from the top out to the lower margin.	Go to 9
	8b) The shell has circular ribs (like tree rings).	Butter Clam (Native)
9. Types of radial ridges and shape of shell.	9a) The shell has heavy radial ridges (4 or 5 mm wide).	Heart Cockle (Native)
	9b) The shell has fine radial ridges (1 or 2 mm wide).	Native Littleneck Clam

Key for Sand Dwelling Animals, (accompanies dichotomous key)

Name the animals and the steps which you took:

Animal # 1) steps: **1 2 3 4a** , , , ,
name: Varnish Clam

Animal # 2) steps: **1 2 3 5 6 8 9a** ,
name: Heart Cockle

Animal # 3) steps: **1 2a 3 5 6 8b,** ,
name: Butter Clam

Animal # 4) steps: **1 2 3 5 6 8 9b,** ,
name: Native Little Neck

Animal # 5) steps: **1 2 3 5 6 7a** , ,
name: Soft Shell Clam

Animal # 6) steps: **1b,** , , , , , , , ,
name: Giant Pacific Oyster

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Notes on Life in the Substrate

Animals **living in the substrate** use **3 different ways to get their food**: **i)** they may eat other substrate dwellers like a moon snail does, **ii)** they may 'process' mud like an earthworm, or **iii)** they may filter food out of the water at high tide like a clam.

Clams create currents in their bodies and bring food-laden water down through their siphons where they filter out the food particles. Clams burrow to a depth limited by the length of their siphons. Species with short siphons and young usually live near the surface, while species with long siphons live further down.

On beaches with few buried rocks, the **Moon Snail** follows the clams below the surface where it drills a hole through their shells. Look for shells with holes from the Moon Snail radula (rasping tongue). The Moon Snail slurps up the clam tissue using an extendible mouth.)

Challenges of living in the substrate: few hard surfaces for attachment, greater problems involved in breathing (few animals can breathe through their skin and many fish and crabs cannot survive here because mud clogs their gills), and more difficulty moving and food gathering.

Advantages of living in the substrate: if a creature can burrow under the surface, wave action does not bother creatures, mud protects them from extremes of temperatures, and they are in little danger of drying out when tide goes out.

Some Inhabitants of the Intertidal Zone

Purple shore crab: lives under rocks and in intertidal; eats barnacles.

Moon snail: digs into sand, pierces clam shells and sucks out their innards.

Littleneck clam (several species): as long as little finger, radiating stripes, close to surface siphons.

Manila littleneck (introduced): shinier, more oblong, geometric patterns, closer to surface than native littleneck siphons.

Varnish clam (introduced): shiny brown exterior, worn white at the hinge, thin oval flat shell, long separate siphons, buried to 20cm, recently introduced, originally from Japan.

Softshell clam: thin brittle elongated shells, large shelf projection on right shell, white to grey exterior with brown or yellow-orange at edges, siphons. Because this shell is not found in middens of coastal aboriginal people, it is believed to have been introduced from the Atlantic.

Macoma clam: shells often have a twist at the posterior end. The Bent-nose macoma and White-sand macoma each have two separate siphons that collect from the ocean floor.

Butter clam: size of closed palm, yellow to grey-white, each ring indicates one year growth, black hinge on outside of shell, live about 20 years, toxins accumulate in siphon, siphons from surface.

Clam worm: large paddle like feet, large black pincer-like jaws to tear algae.

Horse clam: size of open palm, long tough siphon reaches a long way up to surface (at least 30cm).

Blue mud shrimp: thin shell, lives near surface, siphons burrows open to the surface.