

Fossils You Can Find on Oregon Beaches

Oregon's sandy beaches are known for their shells, sand dollars, agates, and jaspers, as well as for a wide variety of Miocene-era marine and mammal-bone fossils.

Geologically speaking, Oregon coast fossils are found in three formations: the Astoria Formation, 15- to 20-million-year-old sandstone layers mixed with compressed volcanic ash; Nye mudstone, up to 20 million years old; and on south coast stretches of beach, Coledo Formation specimens of dark ash and sand, which are 25–30 million years old. These formations of compacted sand, volcanic ash, and river-borne silt are uplifted from the Pacific Ocean floor by geo-plate movement.

Layers of rock and sediment exposed above sandy beaches between basaltic headlands form the larger, more permanent hills along the Oregon coast. The combination of eroding basalt, mud, and sandstone produces a combination of rocks and fossils mixing on the beaches with sand. There are dozens of species of fossilized marine life, ranging from microscopic algae to the hand-size *Panopea abrupta* and the dinner plate-size *Patinopectins* and smaller *Vertipectins*.

Fossils encased in rock are known as *concretions*. Rock attached to fossils is called *matrix*.

Bivalve Fossils

Bivalves (for example, clams) have shells divided on a left-right axis and are generally hinged together with a single adductor muscle. Here's a list of the most common bivalve fossil species on Oregon's coast and a brief description of each:

- *Anadara devincta*—Oregon's most common marine fossil, similar in appearance and shape to the cockles of today (see photo at right). *Anadara devincta* is an indicator fossil world-wide for Miocene-age formations.



Anadara

- *Katherinella angustri*—another common clam fossil with a broad, smooth-patterned shell, often found agatized, or translucent.
- *Acila conradi*—a shell with a very distinctive, chevron-like pattern.

- *Macoma arctata*—a thin, flat shell, often having a hole drilled by snails (which then ate the clam inside).



Macoma

- *Chione ensifera*—a shell with a cross-hatched pattern, similar to the steamer clams available in restaurants.

- *Panopea abrupta*—a very large shell, measuring over four inches across.



Pectins

- *Patinopectin/Vertipectin*—a large scallop shell, found whole in flat, round concretions, sometimes split by nature, often held in seawalls.

A note about seawalls: While Oregon's beaches are public, the seawalls above them where people's homes and public highways are located generally are not. Do not use tools to remove anything from a seawall—this is a violation of Oregon law.

Gastropod Fossils

While clams are the larger and more populous of Oregon's Miocene marine fossils, gastropods (for example, snails) are frequently found, especially in concretions. For some, the attraction of gastropods results from the artistic 180° twist the shell makes during its growth, called *torsion*.

Most gastropods—herbivores and carnivores—use an armored tongue, or “radula,” as a tool to drill through shells into their meals. Common Miocene gastropods making Oregon's coast their home include

- *Bruclarkia oregonensis*—a squatty shaped shell, accented with delicate whorls.
- *Nassarius arnoldi*—a shell with short and slender whorls and artistic ribs.
- *Musashia indurata*—a very large shell, nearly six inches long, seldom found whole.

Continued

■ *Ficus modesta*—a well-rounded shell with a fig-like shape and delicately lined whorls.

■ *Turritella oregonensis*—a shell with high spires, in a tightly curved design, often found in groups.



Snails and clams in concretion

■ *Crepidula praerupta*—an extinct, androgynous, clawlike snail, which moved in colonies linked together.

■ *Chlorostoma pacificum*—a shell with a short, rounded design and a well-defined whorl.

■ *Calicantharus carlsoni*—similar in look to modern whelks, often fossilized with a *Membranipora* coat (similar to moss on a tree or lichen on a rock).

■ *Dentalium schencki*—sometimes known as a “tusk shell”—look for “white drinking straws” in brown or gray rocks.

Wood and Bone Fossils

In addition to abundant marine fossils, Oregon’s coast offers a wide variety of petrified woods. As ocean currents moved along the shoreline and rivers ran into the Pacific Ocean, wood species from other regions were deposited on Oregon’s beaches.

Teredo wood appears as brown to black rocks, usually rounded at the ends with a “Swiss cheese” look to them. Fossilized casings from the *Teredo* marine clam created the pattern when the *Teredo*, in its larval form, ate its way through chunks of ancient wood. These colonies of small larvae never cross each other’s borings, making each piece unique in design and appearance.



Teredo wood

Other petrified woods are light tan to carbonized black, frequently found in sizes ranging from one inch

to two feet across. Look for a dull sheen on wet rocks with parallel wood grain patterns. Softwood species of pines and some hardwoods, including alder, myrtlewood, and oak, as well as petrified palm, are also found on Oregon beaches.

An occasional fossilized leaf impression can be found on or in coastal rocks, recognizable as elm, alder, and Oregon Grape—*Mahonia repens*.

Petrified wood pieces are also often found in concretions of rounded mudstone or hard gray volcanic ashballs. Sometimes split in half by nature, inside these concretions is often carbonized or fossilized wood that was once carried downstream from the Cascade Mountains. Crabs are one type of arthropod found inside concretions when split open—claws, legs, and occasionally whole crabs.

Another genre of fossil found on Oregon’s coast is mammal bone. Usually deposited in hardened sandstone, bone is as abundant as *Teredo* wood and *Anadara* shells. Look for light brown or gray rocks with rounded edges and a darker edge or center, which is usually bone.

Careful matrix removal can expose identifiable fossilized bone, including vertebrae, ribs, jaw bones, joints, and skulls, which may be from prehistoric whales, dolphins, porpoises, sea lions, or seals.



Dolphin vertebra

Most fossils can be found at low tide on sandy beaches, in creek washes, and below the rockier headlands in high-tide rock piles. Fossils found on public beaches may be taken, but they *may not be commercially sold without a permit*. You cannot legally collect or take fossils from marked “marine gardens” or beaches adjacent to Oregon State, U.S. Forest Service, or BLM parks, campgrounds, and natural areas.

Oregon State University’s Hatfield Marine Science Center (in Newport) and the Oregon Museum of Science and Industry (in Portland) are two locations where you’ll find exhibits of fossils discovered on Oregon’s beaches.

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