

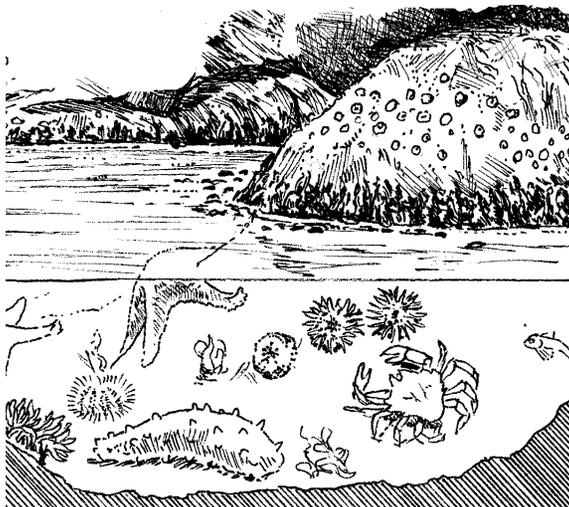
The Intertidal Community

The intertidal zone is an environment in constant transition. Twice daily the tides move in and out. Plants and animals submerged one hour are exposed the next. Severe changes in temperature, pressure, light, salinity and oxygen content occur with each tidal shift. It's no wonder that life at the edge seems strange to us, the surroundings are so different from our own.

A single rock can shelter crabs, fish and clams, and provide growing space for barnacles, sea anemones and mussels. Each of these creatures is both predator and prey in the intertidal ecosystem. It is a community in balance, where all organisms have a purpose.

Rules for Exploring the Beach

- ▶ Watch where you step. Some intertidal creatures are hard to see.
- ▶ If you move a rock, do so carefully. Return the rock to its original position before you leave.
- ▶ Keep a safe distance from intertidal creatures. They live in a harsh environment, and may protect themselves with claws, spines or sharp shells.
- ▶ Do not remove anything from the beach. People often collect kelp, driftwood, rocks, sand and gravel. All these materials provide essential habitat for beach dwellers. Driftwood and kelp also supply critical nutrients that work their way up the food chain to salmon and killer whales.



Red Tide

Red tide is a natural phenomenon that can occur off our coast during the summer months. It stems from a population explosion of single-celled algae (*Alexandrium spp.*), which usually lasts a few weeks. The water is coloured by the algal bloom, hence the name red tide.

The algae produce toxic substances that concentrate in the bodies of shellfish, such as mussels, clams and oysters, making them unfit for human consumption. Even after the red tide passes, shellfish can remain toxic for years. This toxic buildup can cause paralytic shellfish poisoning in humans.

Heed all posted warnings of red tide. Paralytic shellfish poisoning cannot be detected simply by looking at a clam. If in doubt, contact Fisheries and Oceans Canada. Your safety depends on it!



Over 600 kinds of algae have been identified along the British Columbia coast, and fish, seabirds and other marine creatures number close to 5000. Yet these species are just a fraction of what exists in the world's oceans today.

For More Information

BC Parks

<http://wlapwww.gov.bc.ca/bcparks>



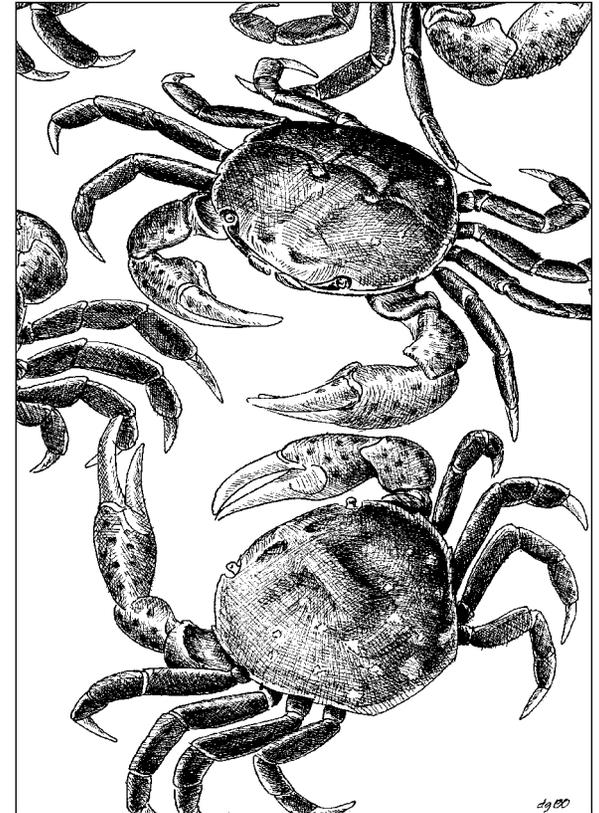
Ministry of Water, Land
and Air Protection



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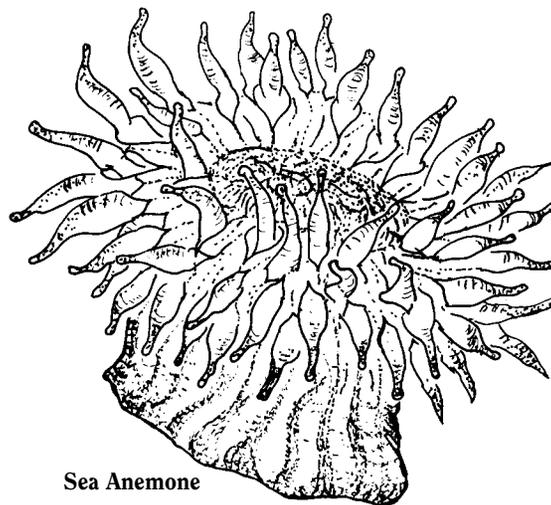
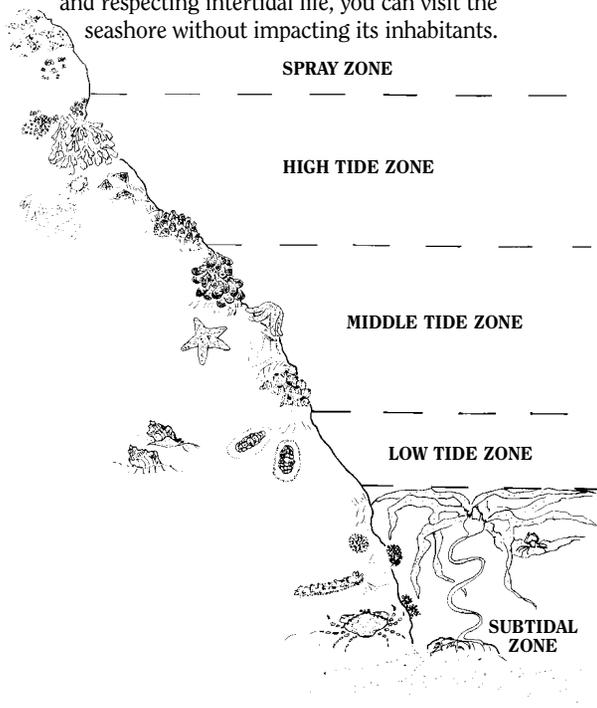
Life at the Edge



Beaches are fascinating places, especially when the tide goes out. Many creatures favour this intertidal zone, or area between the high and low tides, because it offers food, shelter and safety. We hope that as you learn about the many fascinating plants and animals in the intertidal zone, you will appreciate the importance of conserving them and their unique habitats in protected areas.

Intertidal Zones

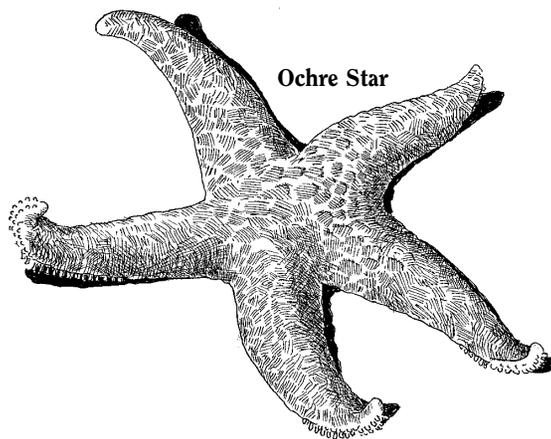
The intertidal zone is the most accessible area of the ocean, which also makes it highly vulnerable. By understanding and respecting intertidal life, you can visit the seashore without impacting its inhabitants.



Sea Anemone

Sea Stars

Sea stars are not fish, although they are sometimes called starfish. These animals have at least five arms, but can have as many as 24. If a sea star loses an arm to a hungry gull, it can grow a new one as easily as we grow a fingernail!



Ochre Star

Examine the sea star's rough surface for a small circular spot called a madreporite. This organ acts as an intake valve for the sea star's internal water pressure system. This system activates the animal's tube feet, which look and act like miniature suction cups. The tube feet are used for holding onto rocks, for moving, and for finding and attacking prey.

Look in crevices, under ledges and in tide pools for the purple or ochre star (*Pisaster ochraceus*). Clusters of mussels and barnacles – their favourite foods – may be nearby. You might also discover a sunflower star (*Pycnopodia helianthoides*), identified by its bright orange or purple colour and numerous arms. It is the largest sea star in the world, measuring up to 80 centimetres across.

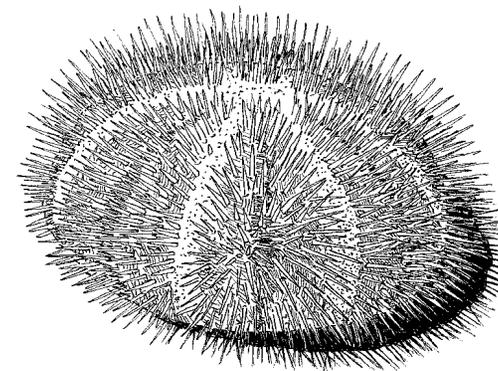
Sea Urchins

Pointed spines cover the shell of the pincushion-like sea urchin. Look among the harmless spines for tube feet, similar to those of the sea star.

Sea urchins are grazers that feed on seaweed and small animals. They, in turn, fall prey to sea stars, sea otters and people. The Japanese and some First Nations groups consider raw sea urchin eggs, or roe, a delicacy.

The green sea urchin is a common urchin of sheltered, rocky shores and tidepools. Its scientific name – *Strongylocentrotus droebachiensis* – may be the longest in the world.

Immature urchins are often found clinging to the underside of large rocks.



Green Sea Urchin

Invertebrates

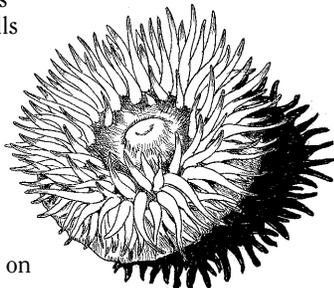
ANIMALS WITHOUT BACK BONES

Sea Anemones

At low tide, look for sea anemones grouped in tidal pools or nestled among rocks. If you spot a large cluster of pink-tipped anemones, they are probably aggregate anemones (*Anthopleura elegantissima*).

Despite their flower-like appearance, anemones are animals. The anemone's stalk-like base is usually attached to a rock. Waving tentacles equipped with stinging cells encircle the animal's mouth. Anemones are carnivorous, trapping small animals in their paralyzing tentacles.

Since anemones occasionally hitchhike, you may see one cruise by on the back of a large crab!



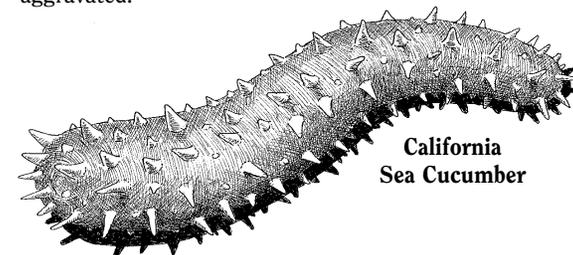
Aggregate Anemone

Sea Cucumbers

An elongated caterpillar-like body identifies the sea cucumber. Warty bumps cover the animal's smooth, elastic skin. Specialized tube feet, resembling dust mops, surround the mouth and filter plankton from the water.

If disturbed or stressed, sea cucumbers spew out their internal organs. A complete new set of organs grows back within a few weeks.

Look for the slow moving, reddish-brown California sea cucumber (*Parastichopus californicus*) cruising the tidepools. This giant can reach 40–45 centimetres in length, but will contract to 15 – 20 centimetres when aggravated.



California Sea Cucumber

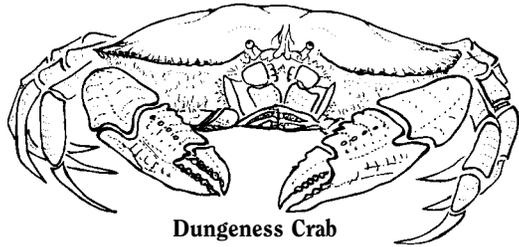
Crabs

Crabs are one of the better known beach residents. Their skeletons are also a common sight, since they shed their shells as they grow. Crabs help keep the beach tidy by dining on both dead and living organisms.

Dungeness Crabs

The large dungeness crab (*Cancer magister*) is a master of camouflage. When completely buried in sand, only its eyestalks and mouthparts are visible. Watch where you step when a low tide exposes eel grass beds. Eel grass is the dungeness crab's favourite hiding spot.

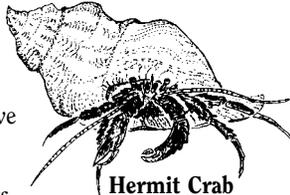
The red rock crab (*Cancer productus*) is a smaller, dark red crab found on rocky shores. This crab often hides under seaweed and rocks at low tide.



Dungeness Crab

Hermit Crabs

If you spot a snail shell that suddenly sprouts legs, you've discovered a hermit crab (*Pagurus*). Watch the crab move sideways along the beach in search of food or a new home. Since their own soft shell offers limited protection, hermit crabs borrow the empty shells of marine snails. Be sure to leave empty shells on the beach for the hermit crabs and other beach dwellers.



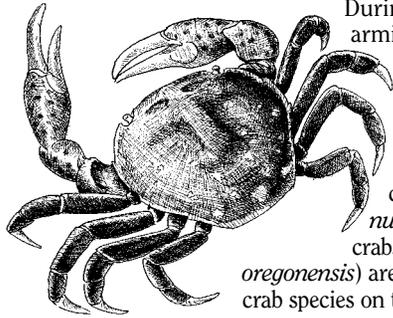
Hermit Crab

Shore Crabs

Gently lift a large stone and watch the small crabs scatter for cover. Be sure to replace the stone before you leave.

During high tide, small armies of shore crabs patrol the beach, dining on leftovers and picking algae from rocks.

The purple shore crabs (*Hemigrapsus nudus*) and green shore crabs (*Hemigrapsus oregonensis*) are the most abundant crab species on the beach.



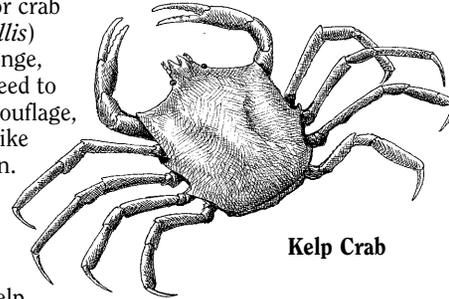
Purple Shore Crab

Kelp Crabs

Watch out for a yellow to dark brown crab sporting extremely long legs. The northern kelp crab (*Pugettia producta*) can reach around with a long-limbed claw and give you a forceful pinch.

The decorator crab (*Oregonia gracillis*) glues bits of sponge, debris and seaweed to its back for camouflage, making it look like a walking garden.

Look for these sharp-nosed crabs under seaweed or clinging to kelp.



Kelp Crab

Barnacles

All we usually see or feel of barnacles are their sharp-edged, immobile homes. Inside live small animals related to crabs.

At high tide, watch this secretive animal open its door to feed. Feathery legs trap small organisms by sweeping through the water like sieves.

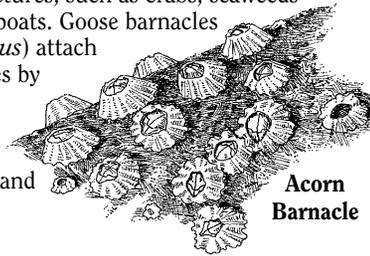
The familiar acorn barnacle (*Balanus glandula*) cements its white, volcano-shaped shell to rocks or mobile structures, such as crabs, seaweeds and boats. Goose barnacles

(*Pollicipes polymerus*) attach themselves to surfaces by long, fleshy stalks.

Barnacles are among the favorite foods of snails, crabs and sea stars.



Goose Neck Barnacle

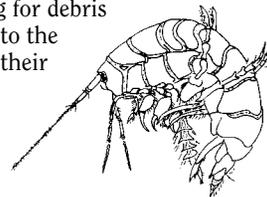


Acorn Barnacle

Amphipods

Every beach has a cleanup crew and amphipods are an essential part of the team. During high tide, beach hoppers comb the shore looking for debris to eat. By orienting themselves to the position of the moon, they find their way home as the tide falls.

Look for beach hoppers, sometimes called sand fleas, under beach logs or clumps of seaweed.



Beach Hopper

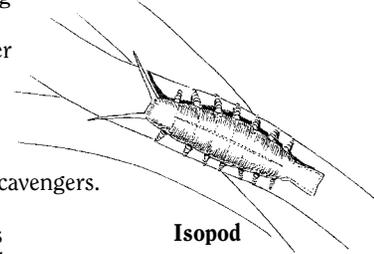
Isopods

Look for the rockweed isopod (*Idotea wosnesenskii*) under seaweed or clinging to rocks. This isopod is related to the land-dwelling sow bug, or wood bug.

The Oregon pill bug (*Gnorimosphaeroma oregonensis*) is another species of isopod that rolls into a tight ball, like an armadillo, for protection.

Many isopods are scavengers.

The gribble (*Limnoria lignorum*) is known as the termite of the sea because it damages floats, docks, pilings and ships; however, gribbles also play an important ecological role by recycling woody debris.



Isopod

Snails

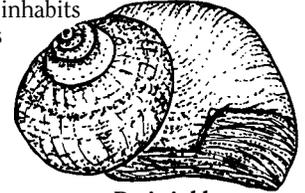
Ocean-going snails carry their homes on their backs, making them well equipped for travel. Herbivorous (plant-eating) snails act like lawn mowers, scraping algae and detritus from rocks. Carnivorous (meat-eating) snails attack other shellfish, such as clams, by drilling holes through their shells.

Look for tiny, dark blue periwinkles (*Littorina*) under rocks and seaweeds. Their larger cousin the dog whelk (*Nucella lamellosa*) inhabits tidepools and rock crevices in the intertidal zone.

Many animals, including fish and birds, eat snails.



Dog Whelk



Periwinkle

Chitons

The chiton (pronounced ki-tun) is often overlooked because of its dark colour and unobtrusive shape. This soft-bodied animal is protected by eight tough, overlapping plates, which act like shingles. A large, undulating foot moves the chiton at a leisurely pace.

Chitons retreat to dark crevices during the day. Active at high tide, chitons graze on algae with their rasping teeth.



Lined Chiton

Limpets

Look for small, hat-shaped shells attached to rocks and other hard surfaces. During low tide, limpets clamp down on their rocks, sealing out the drying effects of sun and air. The limpet's muscular foot acts like a suction cup. At high tide, the limpet forages for algae and debris, always returning to the same spot. This spot is typically a small depression called a limpet scar.

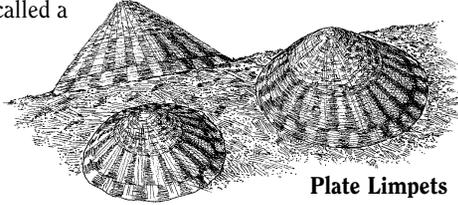


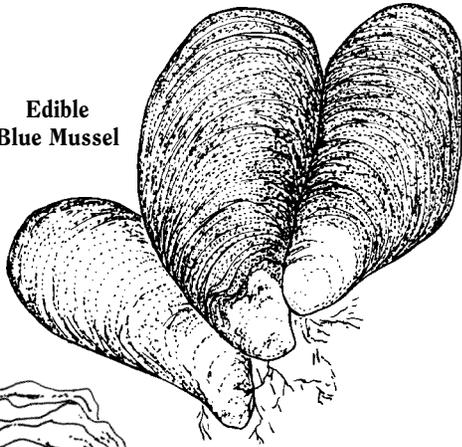
Plate Limpets

Mussels, Oysters and Clams

These two-shelled animals are filter feeders that siphon plankton from seawater. Many species, such as the Pacific oyster (*Crassostrea gigas*), have been introduced to British Columbia. The Pacific oyster has adapted so well that it outnumbers our native oyster (*Ostrea conchaphila*).

Look for edible mussels (*Mytilus*) in large clumps along quiet, rocky shores. Examine the mussel for hair-like byssal threads that anchor the animal to rocks the way guy wires anchor a tent to the ground.

Edible
Blue Mussel



Pacific
Oyster



Vertebrates

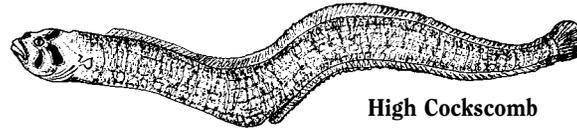
ANIMALS WITH BACK BONES

Fish

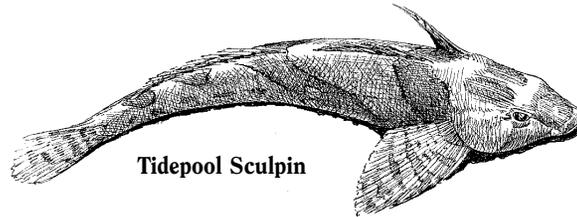
The shadow cast by your hand over a tidepool will cause small fish to dart for cover. Often called bullheads, tidepool sculpins (*Oligocottus maculosus*) are abundant near rocky shores. Smaller specimens are often mistaken for tadpoles.

The sculpin's diet of algae and small animals contributes to its green, red, brown or black colouration.

Look in the same habitat, particularly under rocks, for the eel-like high cockscomb (*Anoplarchus purpurescens*). Not a true eel, the cockscomb has a long, slim body and moves like a snake. This fish's slimy skin keeps it moist during low tides.



High Cockscomb



Tidepool Sculpin

Marine Algae

Marine algae differ from land plants since they have no true root system, stems, seeds or flowers. They are an important food source for many animals, including sea urchins, limpets and some snails.

Nori

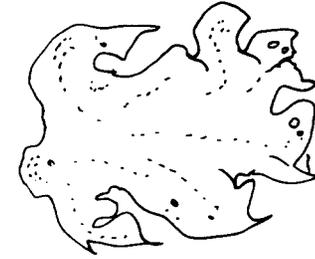
At low tide, you will discover a purplish brown seaweed that appears glued to the rocks. Moisten the nori (*Porphyra*) and watch this algae spring to life.



Nori

Sea Lettuce

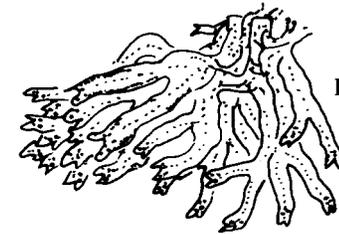
This beautiful, green seaweed is aptly named sea lettuce (*Ulva*). A tiny holdfast at the base of the plant anchors it to the ocean floor.



Sea Lettuce

Rockweed

Rockweed (*Fucus*) has floating air bladders that form at the plant's tips. This algae grows in bushy clumps toward the middle of the high tide zone.

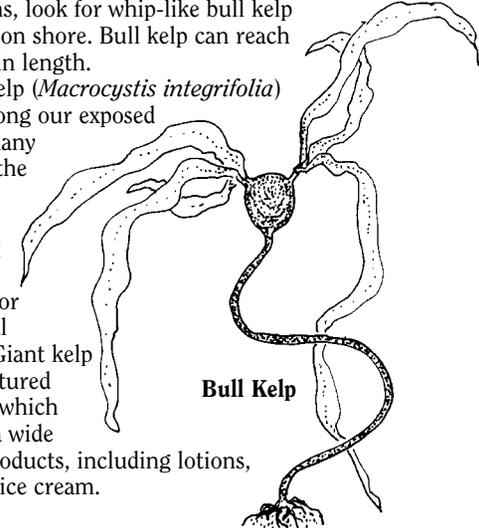


Rockweed

Kelp

Kelp is the name given to any large, brown seaweed. Huge beds of bull kelp (*Nereocystis luetkeana*) form underwater forests off rocky shores during the summer. After storms, look for whip-like bull kelp washed up on shore. Bull kelp can reach 20 metres in length.

Giant kelp (*Macrocystis integrifolia*) is found along our exposed coast. In many regions of the world, this 20- to 30-metre-long seaweed is harvested for commercial purposes. Giant kelp is manufactured into algin, which is used in a wide range of products, including lotions, paints and ice cream.



Bull Kelp