



Making connections

The thousands of species that live on BC's coast are linked to each other and the environment around them in all kinds of ways, creating complex and delicate networks that stretch from inland forests to the deep ocean. Here's just a small snapshot.

BC's salmon-based ecosystems stretch from watersheds far inland to the deep sea. More than 130 species depend on salmon, including rainforest species like eagles, bears and wolves. Even during their early life stages, salmon feed other larger fish, seabirds, as well as marine mammals like seals and orcas. Salmon also provide 10-20% of the nitrogen found in the trees beside rivers and streams.

Volcanic magma has created underwater mountains thousands of metres high. These "seamounts" provide a shallow-water environment in the deep ocean, harbouring black cod, halibut, many species of rockfish and leatherback turtles. The stationary eddies that form around their peaks stop nutrients and larvae from being swept away. Bowie Seamount has the tallest peak, rising from 3100 m off the ground to only about 24 m from the sea surface.

Seaweed grows faster than some of the fastest-growing plants on earth. Bull kelp can stretch up to 1.5 times its length to stop it from breaking in large waves. Forests of kelp create a home for rockfish, lingcod, sea urchins, abalone and crabs.

Leatherbacks are the world's largest sea turtle, weighing up to 900 kg. They migrate north to feed on jellyfish and can travel thousands of kilometres.

Ocean surface currents are driven by the wind, bringing cool water to the tropics and warmer water to northern regions.

Rockfish can live longer than humans. Biologists estimate that one local rougheye was more than 147 years old. Some rockfish take 20 years or more to mature and unlike other fish, they bear live young. Adult inshore rockfish tend to stay in the same local area for the rest of their lives.

Anemones are one of thousands of species of marine invertebrates found here. These carnivorous creatures stay put in one spot and use tentacles covered with venomous barbs to catch shrimp, crabs and small fish.

The unique Hexactinellid sponges are made of silica that has been trapped in sediments. They can form glass-like mounds up to 18 m high and reefs as big as 300 km². Sponge reefs provide important habitat for crabs, shrimp, prawns, octopus, young rockfish and other species.

Black and white orcas have strong teeth that help them feed on seals, dolphins, salmon and birds. Some travel up and down the Pacific coast from California to Alaska, while others remain resident in these waters.

Spawning stage: After one to seven years (depending on the species of salmon), adults begin swimming back to the streams where they were born, following chemical cues in the water. Once they reach freshwater, salmon stop eating, and their bodies release hormones that cause physical changes. For example, spawning sockeye turn a brilliant red.

Although spawning salmon are at the end of their life, they bring the hope of a new generation that will continue to connect and sustain the beautiful forest and marine ecosystems of coastal BC.

Egg: Female salmon lay their eggs in the gravel nests of freshwater streams. The eggs incubate for up to 100 days and hatch between January and March, when the temperature, water quality and flow are right.

Alevin: Barely 2.5–3.5 cm long, these big-eyed fish stay in their gravel nest for about a month after hatching, hiding from fish, herons, ducks and other predators. They get their food from special egg-yolk sacs within their bodies.

Eelgrass creates a sheltered habitat near the shoreline for many creatures, including cod, crabs, snails, jellyfish, anemones and juvenile salmon.

Fry: At this stage, pink and chum fry swim seaward to live in estuaries. Other types of fry may spend up to two years in streams and lakes close to the gravel nests where they hatched. At this stage, salmon have black "parr" marks that camouflage them from predators.

Lingcod males guard the sticky egg mass that the female lays on the ocean floor. These bottom-dwelling fish can grow up to 1.5 m long and weigh 45 kg. They are a source of food for marine mammals and sharks.

Smolt: After spending all their life in freshwater, young salmon now have to adapt to seawater. They grow up to 12 cm long and develop a protective silvery coating. These young salmon provide a tasty treat for larger fish and seabirds such as herons and terns.

The bedrock and boulder rubble that make up **rocky reefs** provide stable shelter in an otherwise rough ocean, creating a home for algae, anemones, rockfish and lingcod.

As winds blow the warmer surface water towards land, the colder water underneath "wells" up to the surface. These **upwelling areas** are rich in nutrients, oxygen and tiny plants and animals called **phytoplankton** and **zooplankton**. This attracts seabirds, salmon, abalone, marine mammals and many other species.

Ocean phase: Once they reach the sea, salmon are always on the move. They hitch a ride on strong ocean currents, travelling thousands of kilometres throughout the north Pacific each year.

Shallow **estuaries** are as productive as the most productive farms. They provide shelter and food for many species of young fish, while the eelgrass meadows and **mud flats** that are often found nearby are important feeding areas for seabirds.

The small crustaceans and fish here feed some of the highest densities of seabirds in the eastern North Pacific. You're not likely to see many of these species, however, because they spend most of their life on the open water. For example, Cassin's Auklets only come ashore at the end of March for nesting season. They land at night, on small islands far away from any human developments.

Although baleen whales such as **humpback whales** are extremely big, they survive by eating tiny creatures like phytoplankton, zooplankton and small fish. They use their baleen—special parts of their mouth that act like sieves—to filter out their dinner from mouthfuls of seawater. Humpback whales grow up to 15 m long.

Deep-sea **hydrothermal vents** are formed when water seeps into cracks in the earth's crust and becomes superheated to more than 400°C. As this water shoots up through the cold ocean, the minerals it carries form a solid "vent chimney" up to 15 storeys high. Here you'll find giant tubeworms, eyeless shrimp, giant clams and spider crabs.