

## Web of Life Cheat Sheet

<b>Pacific Marine Ecosystem</b>	
<b>ELEMENTS</b>	<b>LINKS AND FACTS</b>
<b>ABIOTIC</b>	
<b>Wind</b>	<ul style="list-style-type: none"> <li>• Coastal winds contribute to nutrient upwelling, bringing cooler, nutrient-rich waters up from the depths of the ocean.</li> <li>• This provides nutrients that enhance plankton populations, which are food for the whole marine species complex, such as seabirds, fish, and marine mammals.</li> </ul>
<b>Sun</b>	<ul style="list-style-type: none"> <li>• Sun is important for the growth of seaweeds and phytoplankton.</li> <li>• Heating of the ocean water by the sun is the key process that keeps the hydrologic cycle in motion.</li> </ul>
<b>Water</b>	<ul style="list-style-type: none"> <li>• The land barrier imposed by the Alaskan peninsula prevents much of the cold arctic currents from flowing down the west coast, so there is little oceanic water exchanged between the Arctic and Pacific ecozones.</li> <li>• From south to north within Canada's borders, ocean surface temperatures in the ecozone at any one time vary only about 3° C, while seasonal ocean temperatures vary within a narrow range of about 7° C.</li> </ul>
<b>BIOTIC</b>	
<b>Algae</b>	<ul style="list-style-type: none"> <li>• Phytoplankton are photosynthetic algae that are the anchor of the marine food chain.</li> <li>• Seaweeds are multicellular but have no true stems, roots, or leaves.</li> <li>• Giant kelp, which is large, brown seaweed, provides an "anchor" for sea otters as they sleep.</li> <li>• This seaweed forms "forests" that also provide habitat for many species of fish.</li> </ul>
<b>Sea Urchin</b>	<ul style="list-style-type: none"> <li>• Grinds seaweed with its teeth.</li> <li>• Source of food for sea otters.</li> <li>• Live associated with kelp forests.</li> <li>• The spines are used for locomotion, protection, and for trapping drifting algae for food. Between the spines, are tube feet that are used in food capture, and locomotion.</li> </ul>
<b>Gray Whale</b>	<ul style="list-style-type: none"> <li>• Feeds on shallow, sand or gravel sea bottoms waters that are rich in various invertebrates.</li> <li>• Travels to lower latitudes to bear their young so that the calves can live in warmer water until they develop a sufficient insulating layer of blubber. Gray whales undertake the longest migrations of all whale species (Baja California, Mexico, to the Bering Sea).</li> </ul>
<b>Salmon</b>	<ul style="list-style-type: none"> <li>• Five species in the Pacific Ocean (chum, chinook, coho, pink, sockeye).</li> <li>• Hatch in fresh water, live most their lives in the ocean, and then return to the exact location where they hatched in order to breed.</li> </ul>
<b>Eelgrass</b>	<ul style="list-style-type: none"> <li>• Along the water's edge, coastal salt marshes and mudflats contain beds of eelgrass, important spawning sites for Pacific Herring and nursery sites for many fish species.</li> </ul>
<b>Sea Otters</b>	<ul style="list-style-type: none"> <li>• A true marine mammal it eats, sleeps, mates and gives birth at sea.</li> <li>• Anchors itself in kelp to maintain its position while sleeping or feeding.</li> <li>• It eats abalone, sea urchins, crabs, mussels and fish, as much as 6 kg a day, using a rock placed on its chest to break the shells.</li> <li>• It uses tools more than any other mammal except primates.</li> </ul>

	<ul style="list-style-type: none"> <li>• Found only along the Pacific coast, the sea otter helps control sea urchin populations that graze kelp forests.</li> </ul>
<b>Killer Whales (Orcas)</b>	<ul style="list-style-type: none"> <li>• There are three distinct races of killer whales off the coast of British Columbia. Transients occur offshore and feed mainly on other marine mammals, including dolphins, sea lions, seals and other whales.</li> <li>• Residents are common near shores in summer and feed on fish, primarily salmon.</li> <li>• Little is known about offshore species, but they are believed to feed on fish and squid.</li> <li>• Killer whales, also called Orcas, live in tight associations called pods, which are matriarchal in nature the whales remain with their mother for life.</li> </ul>
<b>Osprey</b>	<ul style="list-style-type: none"> <li>• Osprey are fish eaters. Osprey also consume small, terrestrial vertebrates.</li> <li>• Most migrating Osprey arrive in mid April.</li> <li>• To catch fish, they will hover over a body of water and plunge into the water to catch the fish. Osprey build their nests in trees, atop power poles, and on Osprey platforms that humans have constructed near bodies of water.</li> <li>• The Osprey breeds from near sea level to at least 1,070 m elevation in close proximity to permanent water.</li> </ul>
<b>Ecosystem Processes</b>	
<b>Migration</b>	<ul style="list-style-type: none"> <li>• Migration is probably food and breeding related. There is abundant prey in the northern oceans in the summertime, but in wintertime, the oceans cool, and prey abundance drops off dramatically.</li> </ul>
<b>Glaciation</b>	<ul style="list-style-type: none"> <li>• Affected by extensive glaciation, the coastal areas first "drowned", then "rebounded" as the glaciers melted. First Nations legends describe, and archaeological evidence shows how humans moved their villages with the changing sea levels.</li> </ul>
<b>Predation</b>	<ul style="list-style-type: none"> <li>• Loss of sea otters on Haida Gwaii/Queen Charlotte Islands has resulted in dramatically increased urchin populations. As a result, kelp forests have declined sharply, reducing available habitat for many fish and invertebrates.</li> </ul>
<b>Competition</b>	<ul style="list-style-type: none"> <li>• If human predation of salmon is too high, it can negatively affect other marine predators (orcas) or terrestrial predators and scavengers (bears, marten)</li> </ul>
<b>Nutrient Upwelling</b>	<ul style="list-style-type: none"> <li>• Divergence of water currents or the movement of surface water away from land can lead to a 'welling-up' of deeper water; usually richer in nutrients than the surface water.</li> </ul>