
EAGLEWING TOURS
LTD.

PACIFIC NORTHWEST WILDLIFE GUIDE

—MARINE MAMMAL EDITION—



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INTRODUCTION

The marine mammals in our local area delight visitors. Minke whales, Gray whales, Humpback whales, Dall's porpoise, etc. But it is the vibrant, and ethereal Killer Whale that has captivated our imaginations for centuries. From Spanish sailors in search of new lands to the First Nations Peoples of North America...we all are 'touched' by their presence, magnificence & intelligence.

Whale watching is a must on the south end of Vancouver Island. Our creative & passionate Marine Naturalists/Biologists are eager to share with you an intimate and unlimited resource right here in our very own backyard.

In the event you are unable to join us here in Victoria, It is our great pleasure that we offer to you the most comprehensive marine bird guide in the industry. From the comfort of your own home you may experience the bio-diversity of one of our marine adventures. Come with us as we visit our friends and extended family in their own habitats!

**Thank you for being a part of the Eagle Wing Tours adventure...
...enjoy!**

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PINNIPEDS: Latin: *pinna*-‘winged’, *ped*-‘foot’

*Are marine carnivores (seals, sea lions) that are dependant on land for a portion of their lives VS cetaceans that are totally dependant of water.

- worldwide there are 34 species divided into 3 groups
- 1) Phocidae: ‘true’ or ‘earless’ seals
- 2) Otariidae: ‘fur’ seals & sea lions
- 3) Odobenidae: walrus family (not local – no info in this guide)

I: FAMILY PHOCIDAE: (phocid - true seals- earless)

A) PACIFIC HARBOUR SEALS: *Phoca vitulina*



Description & Fascinating Facts

Harbor seals, *Phoca vitulina*, are the smallest and most common seal species and contain 5 subspecies. Generally, adult males measure 1.4 –1.9m (6’) in length and weigh 55-170 kg (200-270lbs), while the slightly smaller adult females measure 1.2-1.7 m (5.5’) in length and weigh 45-105 kg (120-200lbs). The coat consists of thick, short hairs ranging in color from white with dark spots to black-dark brown with white rings. These patterns are unique to each seal, which helps to identify individuals during observational studies.

The short front and rear pectoral flippers have 5 webbed digits with claws used for scratching, grooming, and defense. The hind flippers also have 5 digits, but these vary in length. The 1st and 5th digits are long and wide and the middle digits are short and thin. The hind flippers are used to propel the seal forward using a side-to-side motion. These seals also move by undulating the body on land.

Male harbor seals live an average of 20 years of age compared to the female life span of 25-30 years.

World Range & Habitat

Harbor seals are also the most widely distributed pinniped (no external ears (Phocid-earless, true seal). They are found in temperate, sub arctic, and arctic coastal areas on both sides of the North Atlantic and North Pacific oceans. Five separate subspecies have been identified, each common to a specific coastal region.

Harbor seals are found in groups only during haul outs for breeding and molting. Aggressive behavior is demonstrated by growling and snorting, which only occurs when threatened, waving fore flippers, and thrusting the head.

Population estimates are poor, however the global population is estimated at 400,000-500,000.

The 5 subspecies include:

The eastern Atlantic Harbor seal, *vitulina*, (a.k.a. the common seal) has an estimated population size of 88,000-93,000 and is found in Svalbard, Iceland, the British Isles, the southwestern Baltic Sea, and on western European coasts from northern Norway to France, including the Kattegat and Skagerrak.

The western Atlantic Harbor seal, *concolor*, is found from the eastern Canadian Arctic and Greenland down to New Jersey, with individuals occasionally found wandering as far south as Florida.

The eastern Pacific Harbor seal, *richardsi*, consists of an estimated 285,000 seals, distributed from the Pribilof and Aleutian Islands in Alaska as far south as Baja California.

The western Pacific Harbor seal, *stejnegeri*, (a.k.a. Kuril or insular seal) is a small population, < 4,000 seals, ranging from the western Aleutian and Commander Islands south to the Kuril Islands and Hokkaido.

The Ungava seal, *mellonae*, (a.k.a. Lacs des Loups Marins Harbor seal), lives in freshwater lakes and rivers on the Ungava peninsula of northern Quebec. They generally haul out in small scattered groups, although in protected bays and estuaries, haul outs can number over 1,000 individuals. Haul out sites are selected for protection from land predators, access to deep water and proximity to food sources, and protection from wind and waves. It is thought that Harbor seals haul out in groups for protection against land predation. The timing of haul outs is often dependent on tidal cycles so that the seals can haul out during low tide. In the absence of tides, the time of day is the major influence on Harbor seal haul out behavior. Haul outs are most common during warmer months.

Individuals of the species tend to stay in the same area all year round, however juveniles are known to travel long distances up to 500km (312mi) to feed. Harbor seals tend to stay within 25km (15.6 mi) of the shore but individuals are occasionally found 100 km (62.5 mi) or more offshore. Harbor seals haul to molt for an average of 12 hours each day compared to 7

hours per day when they are not molting. The metabolism of Harbor seals is reduced while they are molting, therefore less time is needed foraging for food in the water.



Feeding Behavior

The Harbor seal diet varies seasonally and regionally. They primarily feed on

crustaceans, mollusks, squid, and fish. The food is torn into chunks and swallowed whole. The molars crush shells and crustaceans for swallowing, but food is generally not chewed. Adults consume 5-6% of their body weight or 4.5-8.2 kg (8-18 lbs) of food per day. Feeding usually takes place near the shore in shallow water < 200 m (660ft) deep, most often < 100 m (330 ft) for periods of a few minutes. However, Harbor seals have sometimes been known to dive more than 500m (1650 ft) for more than 25 minutes.

Reproduction

Most male Harbor seals reach sexual maturity at 5-6 years of age at a weight of about 75kg (165 lbs) Females reach sexual maturity earlier at 2-5 years or 50kg (110 lbs). Mating season varies, but is generally in the warmer months. Females are ready to breed about 6 weeks after they give birth. The gestation period lasts between 9-11 months, and usually only 1 pup is born each year measuring 70-100cm (3.3 ft) in length and weighing 8-12 kg (26.4 lbs).

Unlike other seal species that molt after they are born, many Harbor seal pups are born with their adult coat, having shed their light colored woolly coat before birth.

Harbor seals can crawl and swim almost immediately after they are born, often within an hour of birth, which is useful for pups born in intertidal areas. Pups are nursed mostly on land but also in water for about 4 weeks during which time they will gain 0.5-.7 kg (1.5 lbs) per day. The mother makes short feeding trips while she is nursing, for longer periods of time as she begins to wean, which is either abrupt or gradual. After weaning, pups disperse often traveling long distances like other seal pup species.

Unlike other seal species, mating takes place primarily in the water. Adult males gather in potential breeding areas and compete by performing aquatic displays, underwater vocalizations, and fighting takes place as demonstrated by neck wounds commonly seen during the breeding season. Some researchers believe that the males maintain underwater territories. Males lose up to 25% of their body weight during the breeding season from the energetic requirements of competing and breeding.

Warnings & Comments

Harbor seals are hunted primarily for their skins, oil, and meat. Their tendency to remain in the same area year-round puts them at greater risk for hunting. Harbor seals are thought by a few to "compete" with commercial fisheries for food sources and unfortunately this myth results in many Harbor seals being killed by humans needlessly. Like other seal species, Harbor seals are threatened by entanglement in fishing nets, particularly in gillnet fisheries. Like the Gray Seal, it is apparently legal to shoot Harbor seals to protect fisheries or fish farms in several countries, such as Canada, Norway, and the United Kingdom. Conservation groups are also promoting the development and use of humane non-lethal seal deterrents such as anti-predator nets on fish farms for this species as well. In addition, the transition from open sea cage fish farms to land-based closed loop systems are being encouraged. Illegal killing of Harbor seals also takes place throughout the species' range.

The species is preyed upon by Orca (Killer Whales)and sharks. Polar Bears are known to be predators of Western Atlantic Harbor seals. Pups may also be preyed on by coyotes, foxes, and large birds of prey. Harbor seals in the Pacific are known to be killed by Steller's sea lions.

B) ELEPHANT SEALS: *Mirounga angustirostris*



Description & Fascinating Facts

Northern elephant seals, *Mirounga angustirostris*, have characteristically long noses giving them their common name—although these noses aren't quite as long as an elephant's! They are slow moving, lethargic (on land), and are the largest and the most unusual of the pinnipeds. This species is sexually dimorphic with adult males weighing 2-7 times more than adult females. Adult males measure up to 4.5m (20 feet) long and weigh up to 2300 kg (8000lbs); adult females measure up to 3.6m (11 feet) long and weigh up to 750 kg (2000lbs.). The Northern elephant seal coat is dark gray to brown. Males can live up to 17 years, females up to 22 years.

They are a highly migratory species and are well known for their incredible diving abilities. Like their cousins the Southern Elephant Seals, these seals are able to dive very deeply for extremely long periods of time compared to other seals. Males dive to 350-800m (2640 ft) on average and females to 300-600m (1980ft). The dives average 13-17 minutes, longer for males, followed by a brief, < 3-minute surface interval. The deepest dives for Northern elephant seals were recorded at 1500m (5000ft) deep for 1.5-2 hours. These seals remain submerged 80-95% of time spent at sea. Researchers have identified five different dive patterns, these patterns associated with travel, sleep and foraging. Northern elephant seals are also in the habit of holding their breaths for as long as 25 minutes while hauled out.

World Range & Habitat

Northern elephant seals can be found on the coast and offshore islands of California and Baja California. They migrate twice a year from California to Mexico and to the male feeding areas in the North Pacific Ocean in the Gulf of Alaska and near the eastern Aleutian Islands. Females tend to feed further south between 40-45°N. The Northern elephant seal is the only mammal with a biannual migratory pattern. The first migration occurs following the winter breeding season, and the second after the summer molt. Males spend about 250 days at sea each year and travel at least 21,000km (13,100mi); the females spend about 300 days at sea and travel at least 18,000km (11,250mi).



haul out period in the autumn.

Population estimates for California is about 84,000 Northern elephant seals in California, 32,000 in Mexico based on data from 1991. Seals congregate onshore during breeding season, molt season, and the juvenile

Feeding Behavior

Cephalopods are an important component of the Northern elephant seal diet. Other prey includes Pacific whiting, skates, rays, sharks, halibut, dogfish, cod, octopus and pelagic red crabs.

Reproduction

Pups are born about 1.5m (4.9ft) in length and 30kg (66lbs) in weight. Females reach sexual maturity at 3-5 years of age, males at 4-6 years although males reach their reproductive peak at 9-12 years. Large adult males arrive at the breeding grounds in December to compete for access to females who usually give birth to the previous year's pup in January 2-7 days after her arrival. The pups are born with black hair, which is replaced by a silvery coat after they are weaned, about 3-4 weeks later.

Toward the end of the nursing period, the mother mates then leaves to feed. Her pup lives off its blubber reserves for 1-2 months before hunting for its own food. Adults do not feed while they are ashore during breeding season, some males for up to 3 months, losing approximately 36% of their weight during this period.

Northern elephant seals undergo an annual molt on shore during the warmer months between March-July for about 2-3 weeks. They undergo a "radical molt" because the fur comes off in sheets. Each sex and age class molts at a different time, beginning with immature seals early in the season and ending with the bulls, which molt in July.

In the autumn, just prior to the breeding season, juvenile seals congregate at the colony sites for around 2 months, beginning in late September and extending through to November.

Warnings & Comments

Northern elephant seals, *Mirounga angustirostris*, were almost hunted to extinction in the 19th century for their blubber. Only about 100-1,000 remained on the Mexican Isla de Guadalupe. In the early 20th century, the species received protection under Mexican and U.S. law, which allowed the Northern elephant seal to successfully recover. In California the population grows at an annual rate of 20-30% and the seals are establishing new rookeries. The recovery has been so successful that numbers may now be approaching peak levels and, in some colonies such as the Farallon Islands, haul out space is limited.

Northern elephant seals are threatened by El Niño events such as the 1997-98 event when Northern elephant seal pup mortality rose to 80%. El Niño events cause severe winter storms, elevated sea levels, heavy rains and high tides that can submerge colonies and wash away pups. It is known that the Farallon Islands colony decreased by nearly half due to habitat changes caused by winter storms during the event. In California, entanglement in gillnets causes an average of 100 deaths per year.



Northern elephant seals are preyed on by Great White Sharks, a significant cause of mortality in juvenile seals, and sometimes also by Orca (Killer whales).

II: FAMILY OTARIIDAE: (otariid - sea lions - with ears)

A) CALIFORNIA SEA LIONS: *Zalophus californianus*

Description & Fascinating Facts

The California sea lions, *Zalophus californianus* are well known for their intelligence, playfulness, and noisy barking. Their color tends toward chocolate brown, although females are often a lighter golden brown. Males may reach 454 kg (1000lbs), average 390kg (858lbs) and 2.1m (8 feet) in length. Females grow to 110 kg (200 lbs.) and up to 1.8m (6 feet) in length. They have a "dog-like" face, and around 5 years of age, males develop a bony bump on top of their skull called a sagittal crest. The top of a male's head often gets lighter with age too. These members of the Otariid, or "walking seal", family have external ear flaps and large flippers that they use to "walk" with on land. The trained "seals" in zoos and aquaria are usually California sea lions.



The sea lion family is large, ranging from around 150kg (330lbs) to over 1500 kg (3300lbs), and males tend to be much larger than females (called sexual dimorphism). Their bodies are slender and elongate. Small, cartilaginous, external ears are present. All otariids have fur. In the sea lions, relatively coarse hairs predominate, while in the fur seals, dense underfur is also present. Colors are generally shades of brown, without stripes or other contrasting markings. The fore flippers of otariids are long and paddle-like, more than 1/4 of the length of the body. The surfaces of the fore flippers are naked and leathery, and claws are present but small. The hind flippers are also large. They differ from those of true seals (phocids) in that they can be rotated under the animal when it is on land, partially supporting the body and walking with a swaying motion. Otariids also have a small but distinct tail.

Otariids tend to be highly social, forming large herds during the breeding season. Within these herds, individual males maintain harems. Males arrive on the breeding grounds before females and set up territories, which they defend aggressively. Females arrive and segregate into harems of 3-40 individuals, depending on the size and strength of the male. Soon after they arrive, females give birth to pups from the previous year's breeding season, and within a few days, enter estrous. Mating takes place on land. A period of delayed implantation insures that the young will be born in a year, when the breeding herds again form.



World Range & Habitat

California sea lions are found from Vancouver Island, British Columbia, to the southern tip of Baja California in Mexico. They breed mainly on offshore islands from southern California's Channel Islands south to Mexico, although a few pups have been born on Año Nuevo and the

Farallon Islands in central California. The current population is estimated at approximately 100,000.

Feeding Behavior

California sea lions are opportunistic feeders diving up to depths of 135m (450 ft) and eat such things as squid, octopus, herring, rockfish, mackerel, and salmon. In turn, sea lions are preyed upon by **Orca (Killer whales)** and **Great White sharks**.



Reproduction

One pup per female is born in June or July and weighs 6-9kg (19lbs). They nurse for at least 5-6 months and sometimes for over a year. Mothers recognize pups on crowded rookeries through smell, sight and their vocalizations. Pups also learn to recognize the vocalizations of their mothers. Breeding takes place a few weeks after birth. Males patrol territories and bark almost continuously during the breeding season.

Warnings & Comments

California sea lions are very social animals, and groups often rest closely packed together at favored haul-out sites on land, or float together on the ocean's surface in "rafts." They are sometimes seen porpoising through the water at 15-20 mph (45kph). Sea lions have also been seen "surfing" breaking waves.

Sea lions have frequently been found illegally shot and also caught in drift or gill nets and other marine debris. However, their population is growing steadily, and California sea lions can be seen in many coastal spots such as Seal Rocks or PIER 39 in San Francisco and our very own Race Rocks in B.C.

B) STELLER SEA LIONS: *Eumetopias jubatus*

Description & Fascinating Facts

The Steller's sea lion, *Eumetopias jubatus*, (a.k.a. Northern sea lion and Steller sea lion), is the largest of the Otariidae (eared seal) family. Adult males measure 2.8-3.2m (10 feet) in length and weigh an average 566kg (maximum 1120 kg-2,200 lbs.). Females reach 2.9 m (7 feet) in length, and 263 kg (maximum 350 kg-600 lbs.) in weight. Adult coats are a light tan to reddish-brown color, usually slightly darker on the chest. The life span of male Steller's sea lions is 20 years, females 30 years.



World Range & Habitat

In 2000, the Steller's sea lion was estimated to have a global population of about 85,000, a decline of more than 50% since 1960 when an estimated 240-300,000 Steller's sea lions lived worldwide. This sea lion can be found from the North Pacific Ocean from California to northern Japan. There are two



distinct populations separated by genetics. The "western population", which lives in the Gulf of Alaska, Bering Sea, Russia and small numbers in Japan, and the "eastern population", which lives from California, to Oregon, British Columbia, and Southeast Alaska. A little closer to home we can find fantastic haul out sites at Race Rocks and Whale Rock (San Juan Island-WA).

Feeding Behavior

Steller's sea lions forage near the shore for fish such as: Pollock, herring, capelin, mackerel, rockfish, and salmon; and cephalopods such as squid and octopus. They have been known to eat Northern fur seal pups, Harbor seals on occasion.

Predators include sharks and **Orca (Killer whales)**. Although they are not typically deep divers, one individual has been observed diving to a depth of over 400m (1320ft).

Reproduction

Female Steller's sea lions reach sexual maturity between 3-8 years, males between 3-7 years, however males do not become territorial around until they reach 9-13 years. Breeding season lasts from mid-May to mid-July. Dominant males arrive early to establish territories on the breeding rookeries on exposed rocks and beaches. These rookeries often have adjoining haul out sites and some rookeries are used as haul out sites when breeding season is over. Females give birth about 3 days after arriving at the rookery. Steller's sea lion pups are born measuring about 1m (3.3ft) in length and weighing 16-23kg (50lbs) with a thick, dark-brown coat that will be shed in 4-6 months for a lighter brown coat.



About 9 days after giving birth, females begin a feeding cycle alternating between 1-3 days feeding at sea and 1-2 days nursing her pup on land. Closer to weaning, the mother spends more time feeding at sea. The average nursing period is 1 year, however Steller's sea lions have been known to nurse up to 3 years. Females mate about 11-14 days after giving birth.

Breeding season is followed by molting season. Females molt in early autumn followed by males in late autumn. Juvenile and non-breeding Steller's sea lions molt in July and August.

Warnings & Comments

Although the eastern population has remained stable at an estimated 39,000 for the last few years, the western population of Steller's sea lions has been declining rapidly. In 2000 there were only about 45,000 Steller's sea lions left in the western population.

The cause of the decline in the western population of Steller's sea lions is unknown. One theory is that food resources have declined as commercial fisheries have increased fishing for ground fish. This theory is a result of the fact that 50-80% of trawl fishery catches in the US have been caught in the sea lion's habitat and consists largely of sea lion prey. For example, in December 1998, an

official US government Biological Opinion concluded that walleye pollock fishing off the coast of Alaska would deplete that species enough to jeopardize the continued existence of the western population of Steller's sea lions. In December 2000, another report concluded that competition with fisheries that target Steller's sea lion prey in the Bering Sea, Aleutian Islands, and Gulf of Alaska is also a significant factor in population decline. Continued fishing for ground fish at current quotas such as: pollock, Atka mackerel, and Pacific cod, are also likely to jeopardize the western population of Steller's sea lions.

Commercial hunting of Steller's sea lions ended in the 1970s. This species is also at-risk of entanglement in commercial fishing nets, which kills an estimated average 30 sea lions yearly. At the southern end of the Steller's sea lion range, population numbers have also been declining in recent years likely due to reduced prey availability, environmental contamination, and disease.

Climate change also threatens these animals. The 1997-98 El Niño may have affected Steller's sea lions in Alaska although it is not known yet to what extent. Warmer temperatures in the Bering Sea alter ocean currents and atmospheric conditions, which may also be affecting the species. A number of Steller's sea lion haul out and rookery sites were affected by the Exxon Valdez oil spill in Prince William Sound, Alaska, in 1989 but it is unknown whether the spill impacted the population.

MUSTELIDS: River & Sea Otters, Minks, Weasels

- Mustelids are the weasels, minks, otters, & ferrets. They are terrestrial (land) carnivores usually associated with freshwater systems, but some have adapted to both freshwater and saltwater environments. Both River and Sea Otters occur both in the marine waters of Washington State and Southern British Columbia

A) RIVER OTTERS: *Lutra Canadensis*

Description & Fascinating Facts

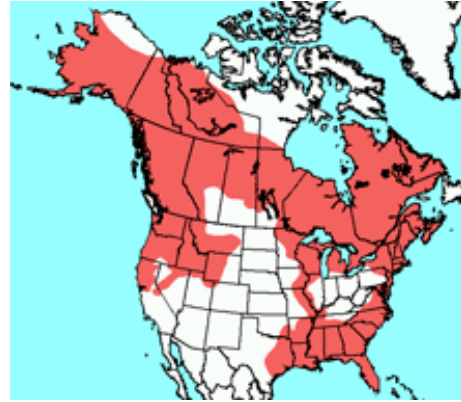
The River Otter or *Lutra Canadensis* is found only in The USA or Canada. It is part of the *Mustelide* family. It is approximately 3-4 ft (1m) long. They have a life span of 25 years in captivity and 15 years in the wild. The River otters have been around a long time, fossils were found dating back to around 200 BC. They are excellent swimmers and divers. They can swim at a speed of about 7 miles per hour (12kph), rarely making a ripple or a splash. They have built in valves and flaps to make the otter water tight while it is under water. The River Otter plays more than other wild animals and they are most active at night. Their clawed and webbed feet are very good for running and swimming. The River Otter's coat can be from a red to black. Their bellies are silvery or a red-brown. Their fur is the most durable in North America and has been in demand ever since the Europeans made contact. It is still-hunted for its fur today, in the last few years over 50000 River Otters were trapped and killed.

River otters communicate using: Chirps, Chuckles, Grunts, Whistles, Screams.



World Range & Habitat

River Otters do well in Alaska, Canada, and in the states along the Atlantic Coast. River Otters have disappeared in nine states and in one Canadian province. They are very sensitive to changes to their habitat. The main reason why River Otters have disappeared in so many places is habitat destruction. River Otters use a variety of habitats, lakes, ponds, and marshes. The beaver makes ideal habitats for the river otter, a quiet, protected pond with an old unused den for the otter to use. River Otters also require huge amounts of territory. In one year a single otter may occupy over 50 miles (80km) of a stream or a river at one point during that year.



The River Otter has a few natural enemies: Wolves, Foxes, & Raptors.

Feeding Behavior

Otters are carnivores, they eat crustaceans, amphibians, reptiles, birds, insects, and mostly fish. They use the sense of touch to find and catch food underwater. Using their whiskers they can sense the movement of their prey to aid them catching it. They mostly hunt by diving and chasing in the water and digging in the streambed. These techniques don't always work. A study found



that otters diving for food had only a 20% success rate. River otters catch their prey in their mouths and hold them with their forelimbs. They eat their food headfirst and throw away the fish fins. After they are finished eating the River otter will clean their face and whiskers in the grass.

Reproduction

River Otters usually travel in families but without the father, who rarely helps the mother rear the young. River Otters reach sexual maturity at two to three years. They breed in March or April and birth takes place in the late winter or early spring. A litter can have one to six otter babies, or *kits*. The average litter has only two to three *kits*. The mothers are extremely devoted parents who teach the young to swim and catch prey by catching it and releasing for the young to catch. The *kits* grow fast

and are roaming outside the den at two to three months. They can care for themselves at five or six months but they usually stay around until the next litter. They are twelve to thirteen months old when they leave the den permanently.

B) SEA OTTERS: *Enhydra lutris*

Description & Fascinating Facts

Sea otters, *Enhydra lutris*, are the largest member of the family Mustelidae (70 species of river otters, skunks,



weasels, badgers, etc.) and are the smallest marine mammal in North America. Males weigh 22-45 kg (99lbs) and are 1.2-1.5m (5ft) in length. Females are slightly smaller, weighing 14-33kg (72lbs) and measuring 1-1.4m (4.6ft) in length. The tail comprises less than a third of the body length.

The pelage (covering, or coat, of a mammal, whether of wool, fur, or hair) is brown or reddish brown. Sea otter fur is the densest of all mammals with about 100,000 hairs/cm² whereas humans only have 20,000 hairs on their whole head!

Since Sea otters do not have any insulating fat, the fur is responsible for maintaining warmth in waters typically 1-10°C (50F). Most mammals' fur sheds rain and water, and keeps them warm by trapping air in the underfur (like a down jacket). In the summer, the mammal would shed most of its underfur, like changing into a less heavy coat. That works wonderfully in the air, but it doesn't work at all in water because temperature changes are usually much less. The Sea otters fur keeps warm also by trapping air in its coat, but the Sea otter's coat does not shed. They have two sets of hair: longer guard hairs and dense underfur. The guard hairs, when clean, are waterproof, protecting the underfur, which traps a layer of air to provide insulation. The use of air as insulation is very efficient, providing four times the insulation of the same amount of fat or blubber. If the hairs are dirty or clogged with oil, then the Sea otters coat won't be waterproof and the Sea otter will die from the cold. You can see now why Sea otters spend a large portion of time daily grooming themselves as they float on top of the water!

The hind legs are long and the paws are broad, flat, and webbed. The forelimbs are short and have retractable claws. Sea otters are the only carnivores with just 4 lower incisors. Females have two mammae.

Sea otter lifespan is 23 years (max) - average is 10-11 years.

Sea otters usually swim on their backs at the water's surface using their rear flippers to move and their tails to steer. They are slow swimmers, about 9kph (5.5.mph) under water. If Sea otters are frightened they will flip over on their stomachs and swim away sometimes diving under water to get away.

There are 3 known subspecies:

Enhydra lutris kenyoni - Northern Sea otter

Enhydra lutris lutris - Sea otter

Enhydra lutris nereis - Southern Sea otter

World Range & Habitat

Sea otters rest in kelp forests, in groups called rafts. Often they will drape the kelp over their bodies like a blanket to keep from drifting away. They are found in coastal waters in the central and North Pacific Ocean. They are however, rare in the Puget Sound and Southern Vancouver Isl.



Sea otters are social, and tend to congregate in groups of gender, with pups and females in a group and males in another group. Females tend to stay away from males except when mating.

Sea otters can spend their whole life in the ocean but will rest on land when the population density is high.

Swimming is performed using the hind limbs, tail, and vertical undulations of the body while the forelimbs are

tucked into the chest. Sea otters are diurnal with crepuscular (twilight) peaks in foraging activity.

They inhabit temperate coastal waters with rocky or soft sediment ocean bottoms less than 1km (.6mi) from shore. Kelp forest ecosystems are characteristic of Sea otter habitats.

Feeding Behavior

Sea otters eat clams, crabs, snails, starfish, abalone, and 40 other marine animals. Sea otters dive up to 37m (122ft) to find food. Their average dive lasts about a minute; the longest dive recorded, however, lasted 4 minutes.

The Sea otter has a method for catching food, which is very good. The Sea otter gets ready to dive, and with a huge breath, leaps into the water. It swims to the bottom, and starts searching for food. A Cormorant may follow the Sea otter, and from the otters upturning of rocks, it can sometimes find a meal for itself. When the Sea otter finds some food, like a shellfish, it will tuck it into loose skin folds in its armpits, which are like shopping bags to the otter. This is all done very quickly, and the otter works hard. It will return to the surface to either eat or just to get a breath and dive again.

When it's underwater, it can use its extremely sensitive whiskers (called vibrissae) to find a small crab or snail hiding in the seaweed or a crevice. It might also use its forepaws to reach into crevices for limpets or chitons that it cannot see. With its surprisingly strong paws, they can easily go through kelp beds in search of crabs or snails. These skills also are of great use when catching one of the Sea otters' favorite foods, abalone. This has angered commercial abalone divers and surprised biologists trying to figure out how the Sea otter releases the creature from the stone. An abalone has two methods of defense; one is a hard and heavy shell, the other its ability to clamp down with tremendous force when disturbed. It has been estimated that the abalone can exert suction equal to about 4,000 times its own bodyweight. The abalone can be from 15-25cm (8in) across and have up to a kilogram (2.2lbs) of meat inside. The Sea otter uses a large stone to get the abalone off the rock. The Sea otter would hold the stone in both paws, and hammer the side of the shell at the rate of 45 blows in 15 seconds! It may take two to three dives for abalone bashing, but the Sea otter's persistence eventually pays off.

When Sea otters come to the surface they lie on their backs and use their stomachs as a table. Sometimes they use a tool, such as a rock, to help them open the hard shells of their prey. They bang the hard shell on the rock until it breaks open. This makes them the only tool-using marine mammal.

Sea otters must eat 25% of their body weight each day in order to stay alive. That means an 18kg (40lbs) Sea otter must eat 4.5kg (10lbs) of food each day!

They will eat nearly any seafood they can find in their kelp forest foraging grounds.

Reproduction

From being an infant to being an adult, Sea otters have an intense life cycle. The Sea otter shows no outward appearance of pregnancy. The only slight indication is the small appetite the day before delivery. Delivery is a very quick process. The female otter will roll about in the water the same way she does when she is cleaning her tail, and on one roll, will come out of the water with a small, wet pup in her teeth. Pups are small, ranging from 1-3kg (6.6lbs). Typically, there is only one pup per pregnancy. On the rare occasion of twins, the mother can only raise one. Her food requirements are large, and so are the pups. The mother would have a hard time getting enough food for two additional mouths. Unlike the River otter, the Sea otter mother is the pup's cradle,

protection, and home for the first months of its life. The mother would only have room for one pup.

Sea otters can reproduce year round. There are peaks of birth in May-June in the Aleutian Islands and in January-March in the California population. Delayed implantation produces varied gestation times. Pregnancy has been reported to be 4-12 months. Females usually give birth about once a year.

Females reach sexual maturity at 4 years. Males reach sexual maturity at 5-6 years, but may not mate until much later.

Breeding interval: Annually

Offspring Produced: 1 (average)

Weaning: 2-11 months

Warnings & Comments

Two hundred years ago, a million otters may have ranged along the 9650km (6000mi) of Pacific coastline from northern Japan, through the Aleutian Islands of Alaska, down the coast of California to Baja Mexico. Because the pelts of Sea otters are thick, warm and beautiful, fur hunters killed hundreds of thousands of them - until not a single otter was visible along the entire California coastline.

The Southern Sea otter was thought to be extinct. Then, in 1938, a raft of about 300 otters was discovered off the coast of Big Sur, California. This group has spread along the 322km (201mi) of California coastline, but its population is still small - only about 2,300.

Southern Sea otters are now protected by the **Endangered Species Act** and the **Marine Mammal Protection Act**, so they cannot be hunted.

Now there are other threats to Sea otters. Oil spills can be fatal to the Sea otter and could cause this species to become extinct. Oil coats the fur, destroying the blanket of air that keeps the animal warm. This causes chilling and death (hypothermia).

Increased pollution in our oceans is also a threat to Sea otters. Fishing nets are another cause of Sea otter deaths. Sea otters become caught in the nets and drown. Laws have been passed to limit the use of fishing nets along the coastline. This has helped sea otter populations.

CETACEANS : all whales, toothed and those using baleen

Whale Evolution

All members of the Order Cetacea are believed to have evolved from terrestrial hoofed mammals like cows, camels, and sheep some 45 million years ago - that's about 40 million years before man! Recent comparisons of some milk protein genes (beta-casein and kappa-casein) have confirmed this relationship and have suggested that the closest land-bound living relative of whales may be the hippopotamus. Throughout their evolution, cetaceans have become perfectly suited to an aquatic environment, and are virtually incapable of leaving it. Cetaceans illustrate an example of adaptive radiation among mammals. Adaptive radiation allows mammals as a group

to effectively inhabit the land, the sea, and the air through the development of special adaptations needed to survive in each of these environments. Members of the Order Cetacea have undergone a number of changes or adaptations needed to fare well in their watery home: their bodies have become streamlined for efficient movement through the water; their forelimbs have been modified into flippers which aid them in steering; their hind limbs have disappeared almost completely; their tail has become broadened horizontally and consists of two large flukes which propel them powerfully through the water by moving up and down, rather than side to side like a fish; in place of hair they have developed a thick layer of fat called blubber under their skin that insulates them from the cold and provides buoyancy; and the position of their nostrils has shifted to the top of their head creating a blowhole that allows them to effectively come to the surface for air. A whale's blowhole generally reaches the surface before the rest of its body.

Adapting to the Sea

In addition, a number of other changes have taken place to help whales adapt to life in the sea. Many of these changes are related to the position and abilities of their sensory organs, as life in the water is not the same as life on the land. Sound and light travel differently in water than they do in the air. As a result, whales have developed unique ways of hearing and seeing. Hearing in particular is highly developed in whales, so much so that they depend on it in the same way that we depend on the combination of our eyes, ears and nose to understand the world around us. Many of the whale's sensory and reproductive organs have been internalized to reduce drag while swimming. For example, whales do not have external ears, but rely on an internal system of air sinuses and bones to detect sounds. Changes in their reproductive and parental behaviors have also taken place, enabling whales to provide optimum care for their young in the cold, large ocean. Along with these differences, cetaceans do, however, possess many of the same physiological systems such as circulatory, digestive, respiratory, and nervous systems as the land mammals from which they evolved. For instance, many species possess multi-chambered stomachs even though there is no obvious advantage to having such an arrangement, as whales do not chew cud!

I: ODONTOCETI: Toothed Whales

- All Odontocetes have 1 blowhole and at least 2 teeth
- 80 species worldwide

A) DALL'S PORPOISE: *Phocoenoides dalli*

Description & Fascinating Facts

The Dall's porpoise is a speed demon, well known to mariners on the British Columbia coast for its habit of riding the bow waves of passing boats.

The Dall's porpoise looks and acts like a little black and white torpedo. Fully grown, it is only slightly more than 2 meters (6.6ft) long, but it is stocky and powerfully built, weighing about 220 kilograms (484lbs). Its small head and short flippers make its body look even more torpedo-like. Its mouth is small and narrow, and like all porpoises, it does not have much of a snout, or beak.



Striking black and white coloring makes the Dall's porpoise easy to recognize at close range. The body is shiny black except for a large white patch on the flanks and belly. The outer edges of the tail look like they've been dipped in white or gray paint. When seen from a distance, the Dall's porpoise can be mistaken for its smaller cousin, the harbor porpoise. Their dorsal fins are both triangular, but the fin of the Dall's is often frosted with white or gray on the tip. Sometimes, the Dall's porpoise is even confused with its much larger, black and white relative, the killer whale. Many boaters unfamiliar with Dall's porpoises have reported a group of "baby killer whales" riding their bow wave.

World Range & Habitat

Dall's porpoises are likely the most common small cetaceans in the north Pacific. They can be seen year-round in coastal and offshore waters all along the B.C. coast, particularly where there are deep underwater channels and canyons. Boaters and ferry passengers often see small groups of Dall's porpoises in the Straits of Georgia and Juan de Fuca, as well as Johnstone and Queen Charlotte Straits off northeastern Vancouver Island.



The Dall's porpoise is one of the fastest swimmers on the B.C. coast. Often, the first view of a Dall's is a v-shaped splash, made by its dorsal fin as it rockets through the water. Because of its shape, this splash is called a rooster tail. Dall's are best known for riding the bow waves of boats, darting back and forth with lightning speed just below the surface. Despite their high energy, they almost never leap clear of the water. When they do travel slower, Dall's porpoises can be hard to spot. A quick glimpse of their dorsal fins and small, black backs is usually the only sign they are there.

Reproduction

Dall's porpoises most often travel in groups of five or less. Births may take place at any time of year, but seem to peak in spring and summer. Calves are about 1m (3.3ft) at birth and may stay with their mothers for up to two years. Very little else is known about the social life of Dall's Porpoises. Identifying individuals using photography is very difficult when the subject is so fast.

Feeding Behavior

The Dall's porpoise likes to eat squid and small schooling fish, such as herring, capelin and eulachon. It uses its small teeth to capture its prey, which it usually swallows whole.

Warnings & Comments

The Dall's porpoise is widely distributed in the north Pacific, where it is estimated there are 1.4 to 2.8 million. It is quite common in B.C. waters. Occasionally, Dall's porpoises are accidentally caught in fishing nets. And, because they live in coastal waters, pollution is a concern. Fortunately, boat traffic seems to be an attraction rather than an annoyance to this lively and entertaining porpoise.



B) HARBOUR PORPOISE: *Phocoena phocoena*

Description & Fascinating Facts

The Harbor porpoise, *Phocoena phocoena*, (a.k.a. Common porpoise), is a small cetacean with a rotund, stocky body that tapers toward the tailstock. This porpoise reaches a maximum length of 1.9m (6ft) and maximum weight of 90kg (198lbs). On average, Harbor porpoises are smaller, and do not exceed 1.5m (5ft) or weigh more than 60kg (132lbs). The females are slightly larger than the males. This porpoise has no beak, but a blunt, rounded snout is present. There are 22-28 small, spade-shaped teeth on each side of the upper jaw and 22-26 on each side of the lower jaw.

The Harbor porpoise is dark gray or dark brown on the dorsal side, lighter gray on the flanks, and white on the ventral side. The flippers are also dark in color with a dark stripe that extends to the eye. The flippers are small, oval, and rounded at the tips. The low, wide dorsal fin is triangular in shape and found slightly behind the center of the body. In some individuals, small nodules are found on the leading edge of the dorsal fin. The flukes are small and curved, and have a median notch.



Harbor porpoises are found singly, in pairs, or in small groups of 6-10 animals, however larger groups between 50-100 animals have been observed feeding. The Harbor porpoise is often found stranded, which is likely due to its preferred shoreline habitat. Although some live stranded porpoises have been taken to aquariums, few survived in captivity.

This porpoise is a non-gregarious species that shies away from boats. They are often detected by the loud puffing sound they make as they surface to breathe.

World Range & Habitat

The Harbor porpoise, *Phocoena phocoena*, is found in shallow, coastal waters of the North Atlantic, North Pacific, and Black Sea in temperate and sub arctic waters of less than 15Celsius (60F). They sometimes swim into bays and large rivers.

Feeding Behavior

The Harbor porpoise, *Phocoena phocoena*, feeds on fishes such as cod, herring, pollock, sardines, and whiting, anchovies, and on squid. This porpoise consumes about 10% of its body weight each day.

Reproduction

The Harbor porpoise, *Phocoena phocoena*, reaches sexual maturity at 3-4 years. Calves are born 70-90cm (3ft) in length 6.4-10kg (22lbs) in weight following a gestation period of about 11 months. Females give birth about every 2 years, and nurse for about 8 months.

Warnings & Comments

Because of its near shore habitat, the Harbor porpoise, *Phocoena phocoena*, has been widely hunted for oil and meat. Although they are still abundant throughout their range, populations have declined. They are at-risk of entanglement in salmon and cod nets in the eastern North Atlantic;

and in trawl and gill nets in the Pacific. In the Baltic and Black seas, populations have declined due to drive fisheries. These porpoises are also at-risk of pollution from pesticides, destruction of habitat by coastal development, and marine traffic.

C) PACIFIC WHITE SIDED

DOLPHINS: *Lagenorhynchus obliquidens*

Description & Fascinating Facts

The Pacific white-sided dolphin, *Lagenorhynchus obliquidens*, has a short, rounded, thick beak containing 23-32 small, rounded slightly curved teeth in each side of the upper and lower jaws. This dolphin is energetic and quite active and is frequently seen leaping, belly flopping, and somersaulting. It is a strong, fast swimmer and enthusiastic bow rider, often staying with moving vessels for extended periods.



The Pacific white-sided dolphin is attractively marked.

Its back is black and its sides are light gray with thin, white stripes that extend from above the eye along the sides, widening towards the tail; its belly is white. It has a black beak and lips and a black ring around each eye.

Its dorsal fin is tall and sharply hooked, and is located at the center of the back. The leading edge is black and the rear portion is light gray. Its flippers are small and curved and rounded at the tips. Its flukes are notched in the center.

These dolphins reach a length of 2.1-2.4m (8ft) and weigh up to 150kg (330lbs).

Pacific white-sided dolphins are often found in large herds of 90-100. The herds are made up of animals of both sexes and all ages. Since they share the same range, they are most commonly seen with Northern right-whale dolphins and are often seen accompanying other dolphins and large whales. They are considered residents in some parts of their range, notably Monterey Bay and off southern California and northwestern Baja California. Transient groups from other areas from the fall to spring join these resident populations.

World Range & Habitat

The Pacific white-sided dolphin, *Lagenorhynchus obliquidens*, inhabits temperate, coastal waters in the North Pacific, avoiding both tropical or Arctic waters. Its range extends from Amchitka Island in the Aleutians, to the Gulf of Alaska south along the coast of North America to the tip of Baja California. It is abundant in Japanese waters with estimates of 30,000-50,000 in that area.



Feeding Behavior

Pacific white-sided dolphins eat squid and small schooling fish such as anchovies, herring, sardines, and hake. It is believed they feed largely at night.

Reproduction

Sexual maturity for both sexes is reached when they are 1.8m (6ft) in length, but this can vary according to geographical location. Length at birth is 80-95cm (3.1ft); gestation period is estimated to be 9-12 months.

Warnings & Comments

This species is no longer commercially hunted in the United States. Some are taken for food in Japan's coastal fishery. They are difficult to catch, however, and the numbers taken are not a threat to the total population in Japanese waters. A few have been captured for display in aquariums, and unknown numbers have been accidentally killed in drift and gill nets. Population figures are unknown.

D) KILLER WHALES: *Orcinus orca*

Description & Fascinating Facts

The Orca (formerly known as the Killer whale), *Orcinus orca*, is actually a dolphin. It is the largest of the dolphin family (Family Delphinidae ~ 32 species, including the dolphins, Pygmy Killer whales (*Feresa attenuata*) and False Killer whales (*Pseudorca crassidens*). Orcas reach a maximum length of over 9 m (30ft) and can weigh 7257kgs (16,000lbs). Because of their fierce reputation, Orcas are sometimes called the *Ballena asesina* ("Assassin whale") by the Spanish. They were referred to as "whale killers" by sailors who witnessed their attacks on larger cetaceans, and over time this name was changed to "killer whales." They are called this not because they harm humans but because they do sometimes kill other whales, hunting them in packs thereby earning the title "Wolves of the Sea." *Orcinus* is probably derived from Orcus, an ancient mythological Roman god of the netherworld - a reference to the ferocious reputation of this animal. Orca literally means "the shape of a barrel or cask" in Latin, likely due to the killer whale's body shape.



Orcas are seen usually traveling in pods of between 3-45 individuals, usually including at least one large male.

World Range & Habitat

Next to humans, Orcas are the most widely distributed mammal. Orcas inhabit all oceans of the world but are most numerous in the Arctic, the Antarctic and areas in nutrient-rich cold-water upwellings such as the Pacific Northwest. They have been sighted along the shores of Washington, Oregon, California, Baja California, and along the eastern coast of the United States.



In addition to cold water areas, Orca also have been seen in warm water areas such as Hawaii, Australia, the Galapagos Islands, the Bahamas, and the Gulf of Mexico. Such sightings are infrequent, but they do demonstrate the Orcas ability to venture into tropical waters. Even more surprising, Orcas have been seen in fresh water rivers around the world such as the

Rhine, the Thames, and the Elbe. One Orca was reported to have even traveled some 177km (110mi) up the Columbia River in search of fish.

Although Orca can be found in both the open ocean and coastal waters, they primarily inhabit the continental shelf in waters less than 200m (660ft) deep. In cold water areas, their distribution is limited by seasonal pack ice.

Feeding Behavior

Active and opportunistic, Orca are THE apex predators in the ocean. In fact, they are the largest predator of warm-blooded animals ever known.

Fishes, squids, seals, sea lions, walrus, birds, sea turtles, otters, penguins, cetaceans (both mysticete and odontocete), polar bears, reptiles, and even a moose have all been found in the stomach contents of Orcas.

The diets of Orcas vary from one region to another. In the Antarctic, Orcas eat about 67% fishes, 27% marine mammals and 6% squid. In the Bering Sea near Alaska, they eat about 65% fishes, 20% squids and 15% marine mammals.



The diets of resident and transient Orcas differ as well. Resident pods eat a wide variety of fishes and rarely seek out marine mammals.

Transient groups primarily eat marine mammals and occasionally eat fishes. Adult Orcas eat approximately 3% to 4% of their body weight in food per day; fully weaned calves can eat up to approximately 10% of their body weight during growth periods.

Much like packs of wolves or prides of lions, Orcas often hunt cooperatively in pods for food. They work together to herd prey into a small area before attacking. When hunting a large whale, a pod of Orcas may attack from several angles.



Reproduction

Studies of Orcas in marine zoological facilities suggest that females become sexually mature when they reach 4.6-4.9m (16ft), at about 10-14 years. Males usually become sexually mature when they reach about 5.5-6 m (20ft), at about 14-19 years. Breeding



may occur in any season, but it is most common in the summer. In the North Atlantic, mating seems to peak in October and November; in the western North Pacific, mating seems to be at its highest between May and June, and mating seems to be at its highest between May-September around the Pacific Northwest Region (Southern Resident Killer Whale Community). The gestation period of an Orca is about 17 months - the longest known of all cetaceans. A female may bear a calf every 3-5 years totaling approx. 4-6 offspring in her lifetime, although a decade may pass before some have another successful birth. Calves are born in the water. The majority of deliveries seen by humans have been tail-first births, although a headfirst birth has been observed. Size estimates of captive-born Orcas suggest that calves average 2.6m (8.6ft) in length and weigh between 136-181kg (400lbs).

Calves nurse below water, close to the surface. The mother glides in a horizontal position with her tail arched, and the calf swims on its side with its mouth on the right or left mammary gland. The mother's milk is very rich so that the calf rapidly develops a thick, insulating layer of blubber. The milk fat content fluctuates as the calf develops, ranging from about 48% milk fat at the beginning of the nursing period and gradually decreasing to approximately 28% in the months that follow. A calf may nurse for 12 months or more. A calf may essentially be weaned at one year of age but may continue to nurse occasionally for several more months.

Warnings & Comments

No attack on a human by an Orca has ever been recorded (in the wild). Orcas are not yet regarded as an endangered species. In 1946, 14 countries formed the International Whaling Commission (IWC) by signing the International Whaling Convention. The IWC set regulations of whaling to protect the future of whale stocks as a resource to humans.

Currently the IWC has no jurisdiction over dolphins such as Orcas. However, now that the harvest of most large whales has stopped, the IWC has expressed an interest in playing a role in managing smaller cetaceans as well.

II: MYSTICETI: Baleen whales

- 11 species
- 20-100 feet in length (range in size)
- all have 2 blowholes
- instead of teeth they have baleen

Baleen is a unique apparatus for filtering food. It is connected to a series of plates that hang from the upper mandible and this allows them to feed on very small prey: such as planktonic crustaceans or baitfish. These whales were hunted for their baleen, which was used for corset stays, buggy whips, and umbrella ribs.

As a result of the whaling industry in the early part of 1900's, 8 of the 11 species of Mysticetes have been so depleted that they are considered endangered.

- Fortunately most are now protected.

A) HUMBACK WHALES: *Megaptera novaeangliae*

Description & Fascinating Facts

The Humpback Whale, *Megaptera novaeangliae*, like all Rorquals (Family Balaenopteridae, the family that includes the



Blue whale, Bryde's whale, Fin whale, Humpback whale, Minke whale, and Sei whale) these long, slender whales are much more streamlined than other large whales. They have a pointed snout, paired blowholes, and a broad, flat rostrum (upper part of the head). The throat grooves, in addition to streamlining the shape of the whale, allow the throat area (called the cavum ventrale) to expand during feeding. The baleen plates are broad and short, and the left and right rows are continuous interiorly. The dorsal fin is falcate (curved).



The head of a Humpback whale is broad and rounded when viewed from above, but slim in profile. The body is not as streamlined as other rorquals, but is quite round, narrowing to a slender peduncle (tail stock). The top of the head and lower jaw has rounded, bump-like knobs, each containing at least one stiff hair. The purpose of these hairs is not known, though they may provide the whale with a sense of "touch." There are between 20-35 ventral grooves, which extend slightly beyond the navel.

Adult males measure 12.2-14.6m (48ft), adult females measure 13.7-15.2m (50.5ft). They weigh 22,680-36,287 kg (79,831lbs). Their scientific name is *Megaptera noveangliae*. This means "giant wings", which refers to their large front flippers that can reach a length of 4.6m (15ft) - about one-third of the animal's entire body length. The body is black on the dorsal (upper) side, and mottled black and white on the ventral (under) side. This color pattern extends to the fluke. When the Humpback whale "sounds" (goes into a long or deep dive) it usually throws its fluke upward, exposing the black and white patterned underside. This pattern is distinctive to each whale. The flippers range from all white to all black. The shape and color pattern on the humpback whale's dorsal fin and fluke (tail) are as individual in each animal as are fingerprints in humans.

Humpbacks have become renowned for their various acrobatic displays. In fact, the common name "humpback" refers to the high arch of their backs when they dive. About 2/3 back on the body is an irregularly shaped dorsal (top) fin. Its flippers are very long, between 1/4 and 1/3 the length of its body, and have large knobs on the leading edge. The fluke (tail), which can be 5.5m (18ft) wide, is serrated and pointed at the tips. One of the Humpback's more spectacular behaviors is the breach. Breaching is a true leap where a whale generates enough upward force with its powerful flukes to lift approximately 2/3 of its body out of the water. A breach may also involve a twisting motion, when the whale twists its body sideways as it reaches the height of the breach. Researchers are not certain why whales breach, but believe that it may be related to courtship or play activity. Some behaviors such as head lunging, which occurs when one whale thrusts its head forcefully towards another whale in a threatening manner, are believed to be aggressive behaviors meant to ward off competitors. Males display this behavior most often to gain access to females. Many other behaviors including fluke slaps, flipper slaps, and head slaps have also been

characterized, although their apparent functions are unknown. At least 3 different species of barnacles are commonly found on both the flippers and the body of the Humpback whale. It is also home for a species of whale lice.

The "songs" of Humpbacks are made up of complex vocal patterns. All whales within a given area and season seem to use the same songs. However, the songs appear to change from one breeding season to the next. Scientists believe that only male Humpbacks sing. While the purpose of the songs is not known, many scientists think that males sing to attract mates, or to communicate among other males of the pod.

The Pod

A Pod refers to a social group of whales. In Hawaii, Humpback whales typically belong to pods consisting of 2-3 individuals, although pods as large as 15 individuals have been sighted. Scientists feel that whales belong to certain pods for relatively short periods of time. One type of pod that is especially interesting is the cow-calf pod. A cow-calf pod represents the longest association between individual whales. In this type of pod the mother whale, the cow, remains with her calf for a year during which time she nurses the young whale. In many instances, cow-calf pods are accompanied by another adult known as an escort. Escorts can be of either sex, but are most often reported to be males. Escorts do not remain in the cow-calf pod for long periods of time, usually for only a few hours. There have been no reported sightings of whale pods which contain more than one calf, indicating that each young whale is given a great deal of individual attention and care. This fact, together with the fact that the normal breeding-cycle of a Humpback whale is two years, helps to explain why the recovery of the Humpback whale population is progressing so slowly.

World Range & Habitat

Humpback whales are found in all of the world's oceans, although they generally prefer near shore and near-island habitats for both feeding and breeding. The current world population for the species is estimated to be between 5,000 and 7,500 individuals, and can be divided into groups based on the regions in which they live. One group found in the North Pacific in the waters off Alaska is estimated to consist of about 2,000 individuals. A large percentage of this population migrates to the Hawaiian Islands during the winter months, November through May, each year. The round-trip distance they travel during this annual migration is approximately 9656km (6035mi), one of the longest migration distances of any animal species. During their stay in Hawaii, they do not feed, but rely upon energy stored in their blubber. Instead of feeding, the whales devote most of their time to mating and bearing their calves.



In the Atlantic, Humpbacks migrate from Northern Ireland and Western Greenland to the West Indies (including the Gulf of Mexico).

In the Pacific they migrate generally from the Bering Sea to Southern Mexico as well. Another known small population migrates from their feeding grounds in Antarctic waters to their Tongan breeding grounds. These whales form part of an Antarctic feeding population south of New Zealand and Australia but little is known about the migration path of this small population and their movements between the Southwestern Pacific Islands. This

"Tongan tribe" is even "more" special than other groups of Humpbacks - it is the last group to be hunted, with the fewest survivors and is the least understood. Hunted until 1979 for their oil, meat and bone, scientists now pursue Humpbacks for observation, while travelers seek them for the thrill and privilege of seeing these magnificent creatures in their natural habitat.

Feeding Behavior

Humpback whales feed on krill, small shrimp-like crustaceans, and various kinds of small fish. Each whale eats up to 1361kg (2994lbs) of food a day. As a baleen whale, it has a series of 270-400 fringed overlapping plates that hang from each side of the upper jaw where teeth might otherwise be located. These plates consist of a fingernail-like material called keratin that frays out into fine hairs on the ends inside the mouth near the tongue.



The plates are black and measure about 76cm (2.5ft) in length. During feeding, large volumes of water and food can be taken into the mouth because the pleated grooves in the throat expand. As the mouth closes water is expelled through the baleen plates, which trap the food on the inside near the tongue to be swallowed. This efficient system enables the largest animals on earth to feed on some of the smallest. They are known to concentrate the food by forming a bubble curtain, created by releasing air bubbles while swimming in a circle beneath the prey.

Reproduction

Humpback whales mate during their winter migration to warmer waters, and eleven to twelve months later, upon their return to winter breeding grounds. They reach sexual maturity at 6-8 years of age or when males reach the length of 11.6m (38ft) and females are 12m (40ft). Each female typically bears a calf every 2-3 years and the gestation period is 12 months. A Humpback whale calf is between 3-4.5m (15ft) long at birth, and weighs up to 907kg (1995lbs). It nurses frequently on the mother's rich milk, which has a 45% to 60% fat content. The mother must feed her newborn about 45 kg of milk each day for a period of 5-7 months until it is weaned. The calf is weaned to solid food when it is about a year old. After weaning, the calf has doubled its length and has increased its weight 5 times, attaining a size of about 8.2m (27ft) and 9072kg (19950lbs). The maximum rate of reproduction for the species is one calf per year, but this is seldom practiced as it puts quite a strain on the mother whale. Scientists estimate the average life span of humpbacks in the wild to be between 30-40 years, although no one knows for certain.



Warnings & Comments

All Rorquals have been hunted and some still are, although they are now protected by all nations subscribing to the Commission. Their tendency to frequent coastal waters and their habitual return to the same regions each year made Humpback whales vulnerable to exploitation by commercial whalers.

Humpbacks were hunted for their oil, meat, and whalebone. Populations were drastically reduced in the early part of the 19th century, leaving only between 5-10% of the original stock remaining. In the North Pacific, it is estimated that as many as 15,000 Humpbacks existed prior to 1900. The population was decimated to fewer than 1,000 individuals before an international ban on commercial whaling was instituted in 1964. Today, the North Pacific population, which returns to Hawaii in the winter months to breed, now numbers approximately 2,000. In spite of their recent strides toward recovery, Humpbacks are still designated as an endangered species. Only the Right whale, another species of baleen whale, is considered more endangered than the Humpback in the North Pacific.



B) GRAY WHALES: *Eschrichtius robustus*

Description & Fascinating Facts

The Gray whale, *Eschrichtius robustus*, (single member of Family Eschrichtiidae, also known as the Pacific Gray whale) is a mysticete (baleen whale) with a streamlined body and narrow tapered head. The arched upper jaw slightly overlaps the lower jaw. The upper jaw (rostrum) is dimpled with each containing a stiff hair. The Gray whale's throat has 2-5 grooves, which are 1.5m (5ft) in length. Its dark skin has gray patches and white mottling and often contains many scratches, patches of barnacles, and orange whale lice (amphipods feeding on whale skin and damaged tissue such as a wound). Newborn calves are dark gray to black and some have distinctive white markings. The Gray whale has no dorsal fin but two-thirds of the way back on its body is a prominent dorsal hump followed by 6-12 knuckles along the dorsal ridge that extend to the flukes (tail) which is 3.7m (12ft) across, pointed at the tips and deeply notched in the center. Gray whale flippers are paddle-shaped and are also pointed at the tips.

Adult males are 13.7-14m (46ft) in length with adult females measuring slightly more (sexual dimorphism). Both sexes reach weights of 27,200-36,300kg (79800lbs).

Migrating Gray whales have predictable breathing patterns, generally blowing 3-5 times in 15-30 second intervals before raising its fluke and then diving for 3-5 minutes. A Gray whale can dive up to 15 minutes and travels at 4.8-9.6kph (6mph). Mother Gray whales are very protective of their calves, and earned the name "Devilfish" from early whalers in lagoons because they often protected their young violently. Orca (Killer whales) is the Gray whale's main predator and many Gray whales have Orca teeth scars on their flukes.

During the Artic winter, when the Gray whale summer feeding grounds (Bering and Chukchi Seas) are frozen, the whales migrate to protected equatorial lagoons to calve and mate. Gray whale migration is the ***longest known of any mammal*** at 16,000-22,530km (14,000mi) round trip, migrating each fall and spring, mainly along the western coast of North America though not all whales make the migratory trip.

During migration they swim steadily, surfacing every 3-4 minutes, blowing 3-5 times while following coasts closely and may be using them to help migrate. Gray whales are often seen "spy-hopping" where a whale sticks its head straight up out of the water, perhaps to make note of land features during migration or as a means of social interaction. Gray whales are the most coastal of the baleen whales and are often found within a kilometer of the coast, although an increase in

boat traffic seems to have forced the whales to stay farther out. Because of their liking for inshore waters, Gray whales are some of the best known cetaceans.

The Gray whale is also one of the most heavily parasitized of the cetaceans, hosting both ectoparasites (parasites which live on the surface of a host and are dependent on at least one gene or its product from that host to complete their own life-cycle) and internal parasites. It carries both barnacles and whale lice in great abundance. The barnacles tend to live on the top of the animal's short head, around the blowhole and also on the anterior part of the back. This also adds to the mottled appearance of the whale's skin.

World Range & Habitat

Gray whales inhabit shallow coastal waters of the eastern North Pacific often sighted along the North American Pacific Coast between the arctic and the equatorial lagoons of Baja California, Mexico. Frequently visible from shore, Gray whales provide opportunity for land and boat observation, and commercial whale watching has become a major industry along its migration route. The southward journey takes 2-3 months and the whales remain in the lagoons for 2-3 months allowing calves to build up thick layers of blubber for the northward migration. The return trip north takes another 2-3 months and mothers and calves travel very near shore on the northbound migration to avoid their main predators, Orca. The Gray whale has also been spotted in the North Atlantic Ocean, as well as in the Arctic Ocean.



Feeding Behavior

The diet of the Gray whale is mainly composed of bottom-dwelling amphipods, isopods, polychaete worms, mollusks, and other invertebrates. The gammarid amphipod, *Ampelisca macrocephala*, is most likely the most commonly eaten prey.

As a baleen whale, it has a series of 130-180 fringed overlapping plates hanging from each side of the upper jaw, where teeth might otherwise be located. These plates consist of a fingernail-like material called keratin that frays out into fine hairs on the ends inside the mouth next to the tongue. The plates are off-white and about 5-25cm (8in) in length.

Gray whales feed primarily during the summer months of long daylight hours in the cold Arctic waters of the Bering and Chukchi seas. To feed, the whale dives to the sea floor, turns on its side (usually to the right), and swims forward along the bottom of the sea, forcing its head through the top layer of sediment along the sea floor. It is there that the whale scoops up its invertebrate prey as well as gravel and mud, leaving a trail behind. The whale then surfaces, straining the sediment through the baleen, which permits only the food to remain in the mouth to be swallowed. The two longitudinal grooves of the throat can stretch open and allow the mouth to expand during feeding, permitting the animal to take in more food. During the entire feeding season the whales must store up enough fat to fast during the breeding season.



Then by the time the whales return to their feeding ground, they have lost up to one-third of their body weight. Even though the whale feed mainly during the months spent in the Arctic waters, they may feed if the opportunity arises at other times during the year.

Reproduction

Gray whales reach sexual maturity between 5-11 years of age when they typically reach 11-12m (40ft) in length. Mating has been noted at all times of the year with most conceptions occurring within a three week period during the southward migration, with females in the late stages of their pregnancies leading the way. Mating has also been observed in the lagoons of Baja California. The December 5th is usually the peak of the mating season for gray whales. Courtship and mating behavior are complex, and frequently involve 3 or more whales at the same time.

Gestation is 12-13 months with calves weighing 500-680kg (1496lbs), which are about 4.5m (15ft) at birth. Calves nurse 7-8 months on 53% fat rich milk (human milk is 2% fat). Gray whales usually bear a single calf about every 2 years. Calves are nursed for around 7 months, during which time they gain motor coordination and establish the mother-calf bond that is needed to keep them together on the migration northward. They are then weaned in the north in the feeding grounds. Gray whales average lifespan is about 50 years with one individual recorded as 77 years old.

Gray whales are frequently observed approaching small boats in the shallow lagoons where they calve and mate and actually allow humans to touch them. The reason why remains unclear but some believe it is out of curiosity whereas others believe it may be due to the sound of the boats motors and that they are being defensive of their calves by checking out the intruders.

Warnings & Comments

Humans for its oil, meat, hide, and baleen have killed gray whales. It was or still is hunted by the natives of northwestern America, eastern Siberia, northern Europe, Japan and Korea. Because they tend to migrate close to the shore, Gray whales are very easy to locate and kill.

Formerly there were three Gray whale populations: a north Atlantic population, now extinct, probably the victims of over-hunting; a Korean or western north Pacific stock now very depleted, also probably from over-hunting; and the eastern north Pacific population, the largest surviving population. Hunted to the edge of extinction in the 1850's after the discovery of the calving lagoons, and again in the early 1900's with the introduction of floating factories, the Gray whale was given partial protection in 1937 and full protection in 1947 by the International Whaling Commission (IWC). Since that time the eastern north Pacific Gray whale population show some signs of recovery and now numbers between 19,000 and 23,000.

C) MINKE WHALES: *Balaenoptera acutorostrata*

Description & Fascinating Facts

The Minke Whale, *Balaenoptera acutorostrata*, is the smallest baleen whale with 50-70 throat grooves. It is a Rorqual whale (Family Balaenopteridae, the family that includes the: *Blue whale*, *Bryde's whale*, *Fin whale*, *Humpback whale*, *Minke whale*, and *Sei whale*) These long, slender whales are much more streamlined than other whales. They have a pointed snout, paired



blowholes, and a broad, flat rostrum (upper part of the head). The throat grooves, in addition to streamlining the shape of the whale, allow the throat area (called the cavum ventrale) to expand tremendously during feeding. Minke whales are the most abundant baleen whale and have a characteristic white band on each flipper, contrasting with its very dark gray top color. They have 2 blowholes, like all baleen whales. Minke whales grow to be about 7.8-9 m long, weighing about 5,400-6800kg (15000lbs). Females are about 0.6m (2ft) longer than males, as with all baleen whales. The largest Minke whale was about 10.5m (34ft) long weighing 8600kg (18920lbs). Minke whales have a snout that is distinctively triangular, narrow, and pointed (hence its nicknames "sharp-headed finner" and "little piked whale"). The Minke whale's skin is very dark gray above and lighter below, sometimes with pale trapezoidal stripes behind the flippers on the top. Minke whales have a characteristic white band on each flipper (this is absent on the southern minke whales).



These whales are stocky, having a layer of blubber several inches thick. They have 50-70 throat grooves, running from the chin to the mid-section. The minke whale has two long flippers (up to 1/8 of the body size), a small dorsal fin, and a series of small ridges along the its back near the flukes (tail).

They either travel singly or congregated in small pods of about 2-3 whales.

Minke whales can dive for up to 20-25 minutes, but usually make shorter dives, lasting about 10-12 minutes. Just before diving, minke whales arch their back to a great degree, but the flukes do not rise out of the water.

They breathe air at the surface of the water through 2 blowholes located near the top of the head. At rest, minke whales spout (breathe) about 5-6 times per minute. The spout of the minke whale is a very low, almost inconspicuous stream that rises up to 2 m above the water. Minke whales begin exhaling before they reach the surface, which minimizes the blow.

Minke whales make very loud sounds, up to 152 decibels (as loud as a jet taking off). They make series (trains) of grunts, thuds, and raspy sounds, usually in the 100-200 Hertz range. These sounds may be used in communication with other minke whales and in echolocation.

World Range & Habitat

Minke whales live at the surface of the ocean in all but polar seas and frequent the Pacific Northwest during spring – fall. Minke whales normally swim 4.8-25kph (15.5mph), but can go up to 29-34kph (21mph) in bursts when in danger. Feeding speeds are slower, about 1.6-9.8kph (6mph).

Feeding Behavior

Minke whales (like all baleen whales) are seasonal feeders and carnivores. They sieve through the ocean water with their baleen. They filter out small polar plankton, krill, and small fish, even chasing schools of sardines, anchovies, cod, herring, and capelin. They have the same diet as Blue whales.

The baleen plates in the Minke whale's jaws have about 300 pairs of short, smooth baleen plates. The largest plates are less than 30cm (1ft) long and 13cm (5in) wide. The fine textured baleen

bristles are fringed and with white bristles.

Reproduction

Minke whale breeding occurs mostly in the late winter to early spring while near the surface and in warm waters. The gestation period is about 10 months and the calf is born near the surface of the warm, shallow waters. The newborn instinctively swims to the surface within 10 seconds for its first breath; its mother, using her flippers, helps it. Within 30 minutes of its birth the baby whale can swim. The newborn calf is about 2.8m (9ft) long and weighs about 454kg (1000lbs). The baby is nurtured with its mother's milk. The mother and calf may stay together for a year or longer. Minke whales reach puberty at 2 years of age and have a life expectancy of over 20 years.

It is estimated that there are about almost 800,000 Minke whales worldwide.

Warnings & Comments

The story of this whale's name illustrates its blighted history. Minke was an 18th-century Norwegian whaler; infamous for regularly breaking the rules concerning the sizes (and therefore species) of whales that he was permitted at that time to hunt. Soon all the small whales became known as "Minke's whales". Eventually, it was formally adopted as the name for this small species.



This guide has been researched, compiled and created by Brett Soberg, lead captain/naturalist & co-owner of Eagle Wing Tours Ltd.

It is my hope that the information contained within this guide effects people in such a way that they become infected with the same enthusiasm about wildlife that I possess. One small step at a time towards personal & educational growth which hopefully some day will lead to global awareness...beauty of diverse life.

Brett David Soberg

THE END