

Northwest Wildlife Preservation Society
Passions for Wildlife
The Beluga Whale

General Description



Source: Shedd Aquarium (www.sheddnet.com)

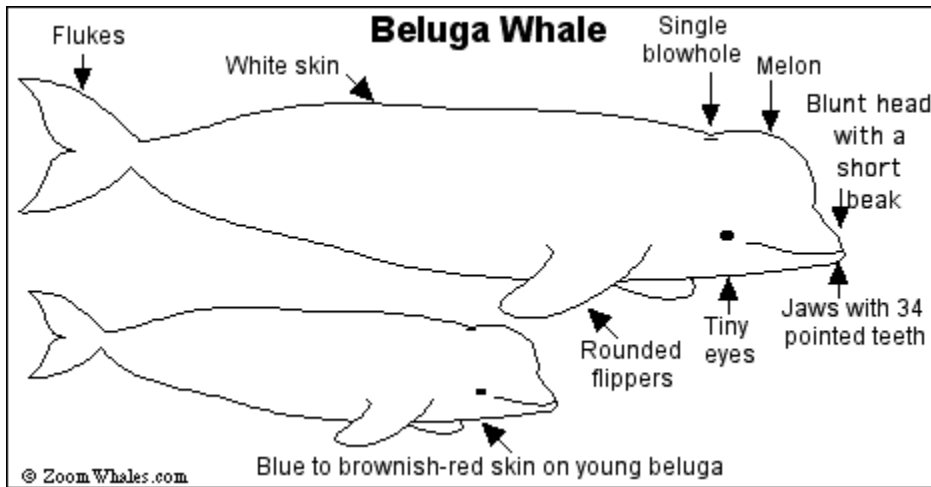
Beluga whales are marine mammals. They breathe air (through their blowhole), give birth to live animals, nurse their young and are a very vocal and social species. Beluga whales are one of three whales that spend their entire lives in the cold arctic and sub arctic waters in the Northern Hemisphere (the other two are the narwhale and the bowhead whale). The name 'beluga' is derived from the Russian word 'belukha,' which means 'white one.'

The scientific name for the beluga whale is *Delphinapterus leucas*, or 'white dolphin with out a wing,' which is fitting, as these whales do not have a dorsal fin. They are also a part of the suborder *Odontoceti*, which means they have teeth (like killer whales, dolphins and porpoises).

Although born dark gray, upon maturity belugas acquire their unique 'white' color, hence why they are also called 'white whales' or 'white porpoise.' Other names known to the beluga are the 'sea canary,' because of their vocalizations, and the 'white squid hound,' due to their color and what they eat.

The beluga whale is an important species for the Inuit and Inuvialuit people and is also hunted by killer whales and polar bears. Beluga populations, however, have generally been declining due to over harvesting and environmental pollution, and some are considered endangered. Worldwide conservation efforts are beginning to recognize Traditional Ecological Knowledge (TEK) of the communities that depend on beluga whales for survival to help in their decision-making processes to help the beluga's future. Beluga whales (along with killer whales) are often found in captivity.

Physical Characteristics



The beluga is a relatively small whale. They are born dark gray and gradually turn white as they mature into adults. Males reach maturity at 8 or 9 years, while females reach maturity at 4 to 7 years of age. They are said to be 'full size' at about 10 years and are thought to live 20 to 30 years in the wild.

Male belugas are larger than females and measure anywhere between 3.5 m to 5 m (11.5 ft to 16.5ft) long and can weigh up to 1590 kg (3500 lbs). Females measure anywhere between 3.35 m to 4.57 m (9 ft to 15 ft) in length and can weigh up to 3000 lbs.

Their thick layers of blubber help insulate them from the cold water in which they live and specialized blood circulation in their rounded flippers and fluke work to maintain their body temperature. Belugas use their rounded pectoral flippers mainly to steer and to stop and are able to swim forwards and backwards.

Belugas have good vision in and out of the water (unlike other whales) and possess a distinctive 'bulging forehead,' which is known as a 'melon' on the top of their heads. This 'melon' is made up of semi liquid fat and is known to facilitate sound production and echolocation and it may also act as a cushion when they use their head to push up through ice.

Belugas have a notched dorsal ridge that may be dark gray that runs along their back instead of a dorsal fin. Belugas must be able to swim just under ice to locate breathing holes and a dorsal fin would greatly impede their ability to do that.

Belugas look like they are always smiling because the corners of their mouths are slightly turned up.

The beluga has 34 teeth and is a carnivore (meat-eater). The teeth are not designed for chewing, but for grabbing and tearing prey, as they swallow their prey whole.

The seven vertebrae in the neck of the beluga are not fused (unlike most cetaceans) so they have greater mobility in their necks.

The narwhale is the closest cousin to the beluga. They share the same habitat; the lack of a dorsal fin and also the non-fused vertebrae in the neck.

Like most cetaceans, belugas lack hair as adults, but unlike most, belugas are the only cetaceans known to molt. Most other cetaceans generate and shed skin continuously while the beluga molts seasonally. They frequently leave the frigid ocean to enter estuaries and freshwater rivers to molt. They will rub on gravel river bottoms to help shed their skin. Belugas are one of the few whales whose entire skin can be used as leather.

Belugas breed about every three years. A female beluga may give birth after a gestation period of 14 -15 months, to a single calf every two to three years; twins are very rare. Breeding and calving occur in bays and estuaries where the water is relatively warm. A single dominant male may mate with several females.

Newborn calves are brown or dark gray and measure approximately 1.6 m (4-5 feet) in length and between 45-78 kg (100-175 lbs) in weight. The newborn instinctively swims to the surface within 10 seconds for its first breath; it is helped by its mother, using her flippers. The baby is nurtured with its mother's fat-laden milk (it is 28% fat) and is weaned in about 12-24 months.

Classification

Beluga whales are one of 76 cetacean species (whales and dolphins).

The Classification of Beluga whales (*Delphinapterus leucas*) is as follows:

Kingdom Animalia (animals)

Phylum Chordata (vertebrates)

Class Mammalia (mammals)

Order Cetacea (whales and dolphins)

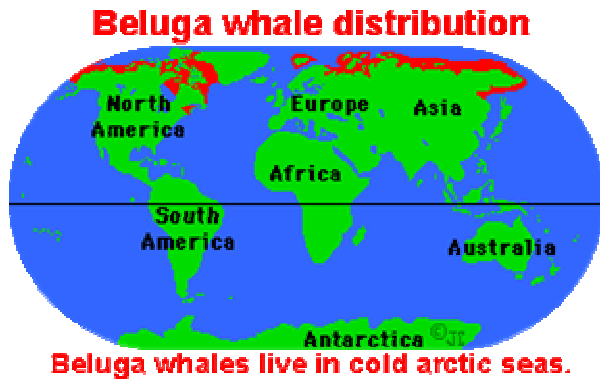
Suborder Odontoceti (toothed whales)

Family Monodontidae (white whales with no dorsal fins and blunt heads)

Genus *Delphinapterus*

Species *leucas*

Where Belugas Live



Source: EnchantedLearning.com

Belugas are well adapted to both Arctic waters and warmer fresh water habitat. Belugas are found in different habitats in different seasons, to follow food and birthing needs. They swim in the deep ocean among pack ice, ice floes and ice burls with ease and they also seek shallow coastal waters along reef edges and bays where water is barely deep enough to cover their bodies. Females and their young are often found in these shallow areas where the surface temperature is warmer. Belugas are also the most adapted of all of the toothed whales, to brackish (partly salty) estuarine waters where the river meets the ocean and will travel up river, often with the tide, in search of food.

Beluga whales inhabit the Arctic Ocean and adjoining seas; Sea of Okhotsk, The Bering Sea, The Gulf of Alaska, The Beaufort Sea, Baffin bay, Hudson Bay and the Gulf of St. Lawrence. Belugas have been found 1,995 km up the Amur River in Russia and 965 km up the Yukon river (Alaska geographic Society, 1978) as well as in the St. Lawrence river in Canada.

While most belugas migrate seasonally, others like the Cook Inlet stock, may stay relatively in the same area (Cook Inlet) year round (Hansen and Hubbard 1999). Belugas seem to travel in pods of a dozen or so whales, although larger pods of hundreds to even thousands of whales are not uncommon during migrations. Belugas also sometimes migrate with bowhead whales and also share their Arctic habitat with their closest cousin, the narwhale.

Some belugas spend summer in the Mackenzie River Estuary and migrate 5000 km to coastal areas of the Bering sea in the winter; other belugas spend summer in the western Hudson Bay estuaries and migrate north into the open bay and James Bay in the winter; while others live in Baffin Bay in the summer and migrate to Greenland in fall; some migrate to eastern Hudson Strait and Labrador, returning to Hudson and Ungava Bays, or Cumberland Sound; some migrate to Bering Sea, returning to Beaufort Sea (first to Banks Island and Amundsen Gulf, then to the Mackenzie River delta). Generally in the fall, large herds can be seen feeding on Arctic cod along the shorelines of Cornwallis Island and Devon Island and can be easily seen traveling along the coast of Lancaster Sound.

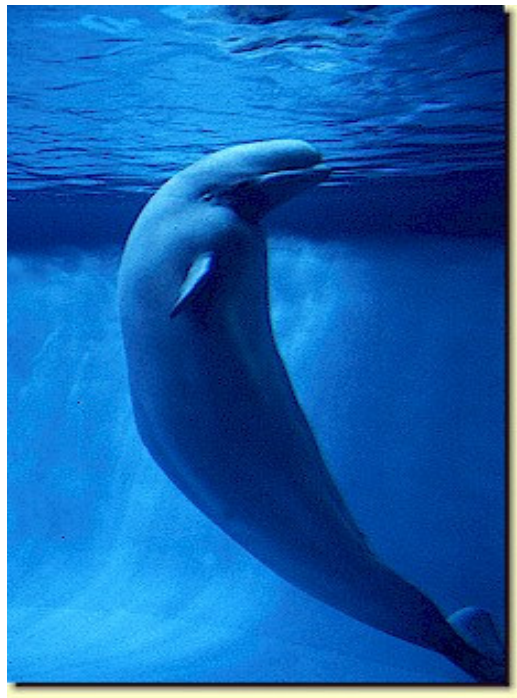
What Belugas Eat

Belugas are on the top of the food chain and prey on over 100 different kinds of animals. Although they eat mostly bottom dwelling animals, belugas sometimes hunt schools of fish with other members in their pod by herding the fish into shallow water before attacking. Belugas use echolocation to find prey and can stay submerged for 15-20 minutes to pursue their food and may travel up to 2-3 km on one dive. They commonly dive to a depth of 66 feet (20 m) to hunt, but are capable of diving much deeper if needed.

A beluga diet will vary according to seasons, location and their age and body size. On average, an adult beluga will consume between 2.5% - 3% of its body weight per day, which is about 40-60 lbs of food per day. Belugas eat animals such as capelin, Arctic Cod, Arctic Char, herring, smelt, flounder, sand lance, squid, octopi, shrimp, crabs, snails, worms and various crustaceans.



Communication



Source: Mystic Aquarium Institute for Exploration

Beluga whales (like other toothed whales) produce sounds to communicate and for echolocation. The beluga is also known to use a wide variety of facial expressions to communicate. Belugas rely on sound production and reception to create acoustical maps to 'read' its surroundings to help navigate, communicate to other belugas, locate breathing holes, and hunt, especially in dark or murky waters where sight is of little use.

Like other toothed whales, the larynx of the beluga does not possess vocal chords but they are able to vocalize (make sounds) from the blowhole on the top of their head. Belugas are very social and produce many different sounds from foghorn moans to high-pitched clicks, squeals and whistles sometimes resembling bird-like songs and chatter, which is why they have been called “canaries of the sea.” A group of beluga can be loud and can be heard above the water and through the hulls of ships.

It is also believed that the belugas ‘melon’ bulge changes shape during sound production, (possibly focusing and directing sonar like sounds) and is therefore instrumental in echolocation. Echolocation refers to an ability that toothed whales (and some other marine mammals and most bats) possess that enables them to locate and discriminate objects by listening for echoes. They send out a sound, which bounces off things in the water and allows them to hear how far away something is.

Because the vertebrae in neck of the beluga are not fused, they can turn their heads more and this might be an asset in their communication.

Social Characteristics



Pod of beluga whales viewed from a helicopter. Photo: S. Loring

Arctic Social Sciences Arctic Study Centre <http://www.mnh.si.edu/arctic/html/tek.html>



Beluga whales are very social animals and congregate in pods (social groups) of 2-25 whales. An average pod size can be about 10 whales made up of both males and females. Often mothers, calves and juveniles stay in shallow water with sand and gravel and mud bottoms, while other groups will venture out to deeper water. A pod will hunt and migrate as a group. During migrations, or in areas of abundant prey, several pods may join together, forming groups of 200-10,000 belugas.

Generally, beluga whales are slow swimmers. They average a speed between 3-9 kph (2-6 mph), but they are capable of sustaining bursts of speed of 22 kph (14 mph) for as long as 15 minutes. Belugas do not seem to exhibit many aerial behaviors like jumping and breaching, as do dolphins and killer whales. (Leatherwood and Reeves, 1983). When swimming in shallow waters, belugas often become stranded at low tide. They generally survive until the next high tide and swim away unharmed (Ridgeway and Harrison, 1981; Leatherwood and Reeves, 1983)

Generally, belugas don't dive very deep, usually to about 20m (66ft) to hunt. A typical dive usually lasts about 3-5 minutes, but they are capable of diving to extreme depths and can stay submerged for as long as 15 minutes. Belugas have been seen making repeated feeding dives to the bottom in spots that are 350-500

m (1200-1600 ft) deep, and have been recorded at diving 400-650 m (1,300-2,100) at times. The record depth for beluga whales is 1100 m (3500 ft). It is not thought that these are feeding dives, but rather a way to find a route through very heavy ice.

Belugas' sensitivity to ships and aircraft seem to be lower when they are in open water and higher when they are along ice edges and in estuaries where there is more likelihood of encountering a ship.

Threats

It is estimated there still may be approximately 150,000 beluga whales in total (IWC 2000, NAMMCO 2000) in the Arctic regions. But many of the 29 stocks recognized by the IWC Scientific Committee have been seriously reduced by hunting (IUCN Red List - Reeves *et al.* (2003, pp. 47-48)). Many beluga stocks are considered endangered.

Beluga whales have always had three natural predators: man, the polar bear and the killer whale. Indigenous Arctic people of Canada, Alaska, Russia and Greenland have hunted belugas for centuries. Today, however, additional human activities and environmental factors are proving to take their toll on beluga populations, causing them to decline.



All of the following effect beluga populations:

- Excessive hunting and whaling for economic gain.
- Culling -- has occurred when fishermen believe the beluga is in direct competition of resources (fish) and for damage to fishing gear.

- Habitat Degradation -- water quality can decline due to dredging, shipping, industrial waste and environmental contamination, which can affect food sources and possible migration habits. Oil exploration and hydroelectric development can also impose threats to beluga habitats and migrations.
- Bycatch – The bycatch problem has become a serious threat among cetaceans particularly with the proliferation of synthetic gillnets which are harder for trapped individuals to escape from.
- Entrapment in ice -- Beluga whales trapped by ice are often susceptible to predation by polar bears, may starve or suffocate.
- Parasites and Bacteria -- Belugas are susceptible to tapeworms, roundworms, flukes and bacterial pneumonia and infection of the respiratory tract (this is a common ailment in marine mammals).
- Stranding - Bacterial pneumonia has been found to be one cause of beach strandings in belugas. An otherwise stranded beluga may die due to the stress of hyperthermia (rise in body temperature) and labored breathing.
- Vessel Traffic and Noise Pollution – It is uncertain how much the noise from vessels, aircraft, drilling, diesel generators or even bulldozers effects cetaceans. But because belugas rely on sound for communication and echolocation for survival, it is possible the stress from noise production may either cause them to abandon traditional habitats or endure a compromised one, which either way, have the potential to have deleterious effects to belugas productivity, health or longevity.
- Environmental contamination – Certain belugas have been found to contain large contaminant loads of toxins such as polychlorinated biphenyls (PCB's), dichlorodiphenyltri-chloroethane (DDT's), organochlorine compounds and heavy metals which can compromise a beluga's hormone and immune system, making it susceptible to pneumonia, ulcers, cysts, lesions, tumors, bacterial infections and reproductive impairment. Because persistent toxins such as PCB's and DDT's become more concentrated as they are passed up the food chain and belugas are at the top of the food chain, they are often victims to harmful concentrations of them. These toxins are passed from mother to calf during gestation and in the milk and can cause deformities in the young. Industrial pollution is the contributing factor to the increase of toxins in the belugas environment.

Conservation efforts



Source: www.cetacea.org

There are many conservation initiatives addressing the decline in beluga populations. Cooperation between governments, conservation groups and Native hunters is essential for their continued survival.

Initiatives to help the continued survival of the Beluga Whale:

- In 1986 the worldwide moratorium on commercial whaling took effect and marked the beginning of a long line of protective measures.
- Allow Native hunters to subsistence hunt and pass on the indigenous knowledge and traditional ecological knowledge (TEK) of their culture to the next generation of Native hunters, conservation groups and governing bodies and together, create a 'beluga survival plan.'
- Marine zoological parks provide opportunity for the public to learn about belugas how human activities impact their survival and an opportunity for scientists to examine biological aspects of the beluga whale that are difficult to study in the wild.
- Regulatory bodies work to create mechanisms for catch compliance, international observer schemes and to govern the release of toxic substances into aquatic habitat. See; The International Union for the Conservation of Nature and Resources (IUCN) World Conservation Union; The International Whaling Commission (IWC); Marine Mammal Protection Act (MMPA); The Convention on International Trade of Endangered Species (CITES); Committee on the Status of Endangered Wildlife in Canada (COSEWIC); Species at Risk Act (SARA). The Fisheries Act, Canada Shipping Act; Canadian Environmental Protection Act; The Canadian Wildlife Act; The Canada Oceans Act; The Canada Department of Fisheries and Oceans (DFO) and Environment Canada (a government agency that oversees national parks) implemented the St. Lawrence Action Plan. The goal of the plan was to eliminate 90% of all industrial emissions in the St. Lawrence River by 1993. As of 1992 emissions had been reduced by 59% (Dold, 1993); National Marine Fisheries Service (NMFS); Cook Inlet Marine Mammal Council (CIMMC); The Cetacean Specialist Group (CSG), etc....

No living animals have captured our imaginations as have the great whales... They fire our imaginations and stab at our emotions. They inspire our art, literature, and music. And so they should. The indescribable blend of grace, power, and beauty of a whale as it glides underwater, leaps toward the sky, or simply lifts its flukes and slides into the sea symbolises a vanishing poetry of the wild.

- Dr James Darling, With The Whales

<http://www.cetacea.org>

Along with killer whales, belugas are the only great whales to be regularly kept in captivity. In a 1994 National Geographic article, whale scientist Kenneth S. Norris described an encounter in an aquarium that piqued his interest in finding out more about these whales in the wild:

Perfectly white with dark lustrous eyes, the 12-foot-long beluga whale glided up and braked to a stop on the other side of a large window at the Vancouver Aquarium in Canada. Then he did a strange thing.

From the blowhole atop his head he slowly blew a big mushroom-shaped globe of air into the water. Backing away from the rising bubble, he extended his mobile, pursed lips and sucked it into his mouth.

Next the whale puffed the air back into the water ahead of him. He eyed his creation, which expanded as it rose. Then he matter-of-factly sucked it in again.

Not finished yet, he backed away a little and blew the air out once more. This time he nodded his head sharply downward, sending an invisible boil of water against the expanding bubble. It instantly became a twisting bracelet, shining and expanding until it began to break into flattened, rising spheres.

Then he sucked up the bubbles, pumped his flukes and was off.

I didn't know what to think. In four decades of studying porpoises, dolphins, and whales all over the world, I'd never seen anything quite like it. Many animals engage in play, but this beluga seemed to be showing an interest in something more like art.

Resources

COSEWIC -- COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA
http://www.cosewic.gc.ca/htmlDocuments/CDN_SPECIES_AT_RISK_May2003_e.htm#a_results

Canadian Arctic Profiles --- <http://collections.ic.gc.ca/arctic/species/beluga.htm>

Beluga Whale – Ungava Bay Populaton --- www.speciesatrisk.gc.ca

Seaworld --- <http://www.seaworld.com>

Mystic Aquarium Institute for Exploration --- <http://www.mysticaquarium.org>

Shedd Aquarium --- www.sheddnet.com

www.EnchantedLearning.com

University of Vermont --- www.uvm.edu/whale/BelugaRangeHabitat.html

Smithsonian National Museum of Natural History – Arctic Studies Center
www.mnh.si.edu/arctic/html/beluglua_whale.html

Beluga Whale --- www.kidsplanet.org (Defenders of Wildlife)

Decline of Beluga Population --- <http://transition/alaska.edu>

Links to International Fisheries Organizations --- http://www.st.nmfs.gov/st1/links_to_data.html

National Marine Mammal Laboratory – Alaska Fisheries Science Center – National Oceanographic and Atmospheric Administration — Beluga Whale Research
<http://nmml.afsc.noaa.gov/CetaceanAssessment/BelugaWhale.html>

Book: The Spirit of the Whale – Legend, History, Conservation Ed: Jane Billingham © 2000 Raincoast Books (www.raincoast.com)

Journal of Cetacean Research and Management Editorial from Volume 1 Issue 1 (JCRM)

Published by the International Whaling Commission <http://www.iwcoffice.org/>

Dolphins, Porpoises and Whales : 1994-1998 Action Plan for the Conservation of Cetaceans. IUCN (International Union for Conservation of Nature and Natural Resources). Gland, Switzerland 92pp.
<http://www.iucn.org/>

IUCN Species Survival Commission 2003 IUCN Red List of Threatened Species
<http://www.redlist.org/search/details.php?species=6335>

Traditional Ecological Knowledge of Beluga Whales
Arctic Social Sciences Arctic Study Centre <http://www.mnh.si.edu/arctic/html/tek.html>