

Beluga Whale

Delphinapterus leucas

Commonly Asked Questions:

Name: Beluga Whale or White Whale
Scientific Name: Delphinapterus leucas

Size: Adult Calf

Avg. Length: 11 - 15 ft. (3.4 - 4.6 m) Avg. Length: 5-5.3 ft. (154-161 cm)

Avg. Weight: 1100 - 2500 lbs. (499-1134 kg) Avg. Weight: 136.7-196.2 lbs. (62-89 kg)

Maximum Age: Information unknown as there are belugas in human care still living that

are over 40 years old.

Range: Found in the Arctic and subarctic waters

Diet: Primarily fish, also benthic crustaceans and mollusks (in natural environment)

Range/Habitat

Range

- Found throughout the Arctic with some sub-arctic populations such as the St. Lawrence and Amur rivers.
 - From Svalbard, Norway around to the west coast of Greenland.
- Distribution
 - Although all belugas are considered the same species, they are sometimes further referred to as subpopulations, that may be genetically and/or geographically isolated from other subpopulations (i.e. Cook Inlet stock, Ungava Bay stock, St. Lawrence River stock, Bristol Bay stock, etc.)
- Habitat
 - Belugas can be found in a wide variety of environments, from deep offshore waters to shallow bays and estuaries; even ranging far upriver.
 - Can travel back and forth between fresh and salt water.

Physical Characteristics

- Unique Adaptations:
 - Unfused cervical vertebrae allows for neck flexibility. This adaptation allows for maneuverability in shallow water to hunt and to escape from predators.
 - Very thick layer of blubber, thick skin, relatively small tail flukes and pectoral flippers, and absence of a dorsal fin are adaptations for life in cold water.
 - The melon is the rounded structure on the top of the beluga's head, just in front of the blowhole. It is composed of lipids (fats) and can change shape when the whale is producing sounds. The melon focuses and projects echolocation signals





through the water. It is unique to toothed whales and not found on baleen whales.

- Lips can be pursed to form the shape of an "O."
- Tongue forms a tight seal around fish which allows the beluga to swallow prey without ingesting water.
- Rather than a dorsal fin, which would be prone to injury from ice and heat loss, a beluga has a dorsal ridge.

Color:

- Generally pale gray to pure white as adults, belugas are a light brown-gray color at birth. Their light coloration is believed to camouflage the animal in snowy, icy surroundings.
- Areas such as the dorsal ridge, the edges of the pectoral flippers and the edges of the tail flukes may be darker on adult belugas.

Size:

- Average weight and length of an adult ranges between 1100-2500 lbs. (499-1143 kg) and 11-15 feet (3.4-4.6 m).
- Average calf birth weight is 136.7-196.2 lbs. (62–89 kg) and length is 5-5.3 ft. (154-161 cm).
- The maximum adult weight reported is 3600 lbs. (1633kg).
- Belugas show sexual dimorphism, with males being approximately 25% larger than females.

Teeth:

- o The Beluga whale has 30-40 homodont, conical teeth.
- Teeth are not replaced if lost.
- o A calf's teeth begin to come in between 1 and 2 years of age.
- The teeth of Odontocetes contain growth rings, called "Growth Layer Groups" (GLG).

Diet/Feeding

Diet/Amount:

- The diet of a beluga whale is the most diverse of any of the smaller whales. Diets
 of subpopulations are regionally and seasonally influenced.
- They are opportunistic feeders, and will consume over 100 species of marine and freshwater fish, mollusks, crustaceans, and even zooplankton.
- Belugas do not chew. Larger prey may be torn into smaller pieces, but most food is swallowed whole.

Feeding Behaviors:

- Belugas can hunt cooperatively to conserve energy.
- Spit and suction behaviors allow belugas to catch benthic (seafloor region) prey.

Conservation Status

• "Critically Endangered" - Cook Inlet stock





- "Endangered" Ungava Bay and East Hudson Bay stocks
- "Threatened" St Lawrence River stock

Additional Information

- Social Units:
 - Pod structures are very fluid, with individuals moving between different pods.
 - o It is common for belugas to form groups from 2 to several dozen individuals.
 - Belugas are gregarious, and often hunt and interact in groups. Some stocks are migratory, and some are not.
 - o The mother/calf bond is thought to be the central social relationship for belugas.
 - Groups are called pods and most often composed of two to several dozen animals.
 - o Pods can join to form herds of several hundred animals at a time.
 - o Pods often consist of the same sex and age class.
 - Males often travel in tight pods of 10 -15 individuals. Females and their young form pods, with calves sometimes remaining with their mothers for 4-5 years or more.
 - Females without young tend to form pods.
 - Older subadults can also be found together.

Reproduction:

- Sexual maturity
 - Females between 5-7 years of age
 - Males between 8-9 years of age
- Reproductive cycle is strictly seasonal, though there is slight variability between regions.
- Observed in human care, gestation ranges from 15-16 months.
- o Births occur most often from late spring to early summer: April July
- Belugas give birth to one calf at a time.
- Females give birth every 2-4 years.
- An average birth lasts eight hours.
- Most calves nurse until the age of 2 years, although nursing has been observed lasting longer than that.
 - Calves may not successfully nurse until more than a day after birth.
 - Once nursing, belugas will nurse about every 36 minutes, day and night.
 - Calves curl their tongue, similar to humans, which is used as a straw for nursing. When curled a water-tight seal is formed by the scalloped edges around the tongue.
- Skin:
- Beluga skin is ten times thicker than dolphin skin and one hundred times thicker than terrestrial mammal skin.
- A calf's skin is thicker upon birth to compensate for the lack of blubber. As the calf develops a thick layer of blubber, the skin is shed.





- The white color of a beluga's skin is thought to provide camouflage among sea ice.
- Belugas are constantly sloughing their skin, but also experience an annual molt, which is unique among cetaceans. This may be triggered by environmental cues such as temperature and salinity.
- Belugas have well-developed skin sensitivity which plays an important role in tactile-oriented social behavior.

Blubber:

- Below the skin is a thick insulating layer of blubber which is considered unusually thick when compared to other Odontocetes (toothed whales). This layer of blubber is one of the beluga's greatest adaptations to life in the freezing temperatures of the Arctic.
- o Blubber accounts for 40-50% of their body weight.
- Typical thickness of blubber is 4 inches (10 cm), but thicknesses of up to 10.6 inches (27 cm) have been reported.
- Thickness varies seasonally.

Vision:

- The beluga whale has good vision below and above the water surface.
- Oily mucus is secreted that protects the eyes, washes away debris and possibly streamlines the eye as the beluga swims.
- Scientists are unsure if the beluga possesses color vision. The eyes do contain both rods and cones; however, there is only one type of cone, and two or more is typically necessary for color vision.

· Sleep State:

- The beluga engages in unihemispheric slow wave sleep (USWS) in which one half of its brain is in a sleep state, while the other half maintains visual and auditory awareness of the environment, while allowing it to surface to breathe.
- A common resting behavior is logging, in which a whale lies still at the surface of the water. Belugas also have the ability to swim while sleeping.

Tooth Aging:

- Research conducted in wild populations has yielded two theories on how age is determined based on Growth Layer Groups (GLGs).
- The prevailing theory for many years was that for every two GLGs deposited was equivalent to one year of life (2:1 ratio).
- The second and most recent theory, the One GLG Theory, concluded that every GLG deposited is equivalent to one year of life (1:1 ratio).
- Although current data tends to support the One GLG Theory there still is some debate. Scientists have determined more research will have to be done in the study of tooth aging.

• Life Expectancy:

 Estimated life expectancies in wild beluga populations vary from one study to another.





- Using data from published studies and adjusting results to the One GLG/year theory, it was determined that adult life expectancy of belugas in wild populations is not different from those in human care.
- The longevity of belugas in human care has yet to be established because the oldest belugas in human care are currently living and are over 40 years of age.
- o Further research and information is still forthcoming.

Swim Speed:

- Adults routinely swim at speeds of about 2 to 6 mph (3 9 km/h).
- The maximum observed swim speed of a beluga whale is about 17 mph (27.5 km/h) for short distances.
- The beluga whale can swim backwards. This adaptation is helpful in an environment where sea ice can change rapidly.

· Dives/Depths:

- Most dives range between 9-18 minutes.
- o Feeding dives last 18-20 minutes, rarely lasting longer.
- o Dives lasting up to 25 minutes have been recorded.
- o Belugas can reach depths of 3,300 ft. (1,000 m) in their natural environment.

Hearing:

- The Beluga whale has acute hearing, and can detect sounds ranging from 1.2 to 120 kHz.
- Small external ears on the sides of the head may be useful for detecting low frequency sounds, but high frequency sounds are mainly received through a fatfilled canal in the lower jaw.

Smell:

The beluga's brain lacks an olfactory system (sense of smell).

Vocalization:

- Called "sea canaries" due to an extensive repertoire of sounds. Belugas have the most diverse vocal repertoire of all cetaceans.
- Their diverse repertoire is composed of the predominant sound types among toothed whales: whistles, clicks, chirps, groans, trills, buzzes, roars.
 - Whistles: narrow-band frequency-modulated vocalizations
 - Pulsed sounds: trains of broad band pulses
- Increased vocalizations have been observed during social interactions.
- "Contact calls," broad-band pulsed vocalizations associated with bonding, play an important role in establishing or maintaining contact between mothers and calves.
- Adept at mimicking sounds. This ability suggests that they may use vocal learning in developing their natural vocalizations.

Echolocation:

 Click-like pulses produced by the beluga are used for echolocation, a sort of biological sonar. The bounce-back from these signals is received in the fat-filled





- channel in the lower jaw bone and transmitted to the inner ear, which sends nerve impulses to the brain.
- Echolocation allows the animal to locate prey, identify predators and navigate in dark or murky water. This is especially useful to the beluga in shallow freshwater environments as well as among sea ice.
- Using echolocation, a beluga can determine an object's size, shape, structure, composition, speed, distance, and direction.
- Echolocation may be used to determine how deep a beluga must dive to reach the bottom before initiating the dive.
- The beluga can change the frequency of its clicks in the presence of background noise to better utilize its echolocation.

Threats:

- The accumulation of chemicals and heavy metals released into the environment by human activities continues to impact beluga populations both directly and indirectly. They are at the top of the food chain and thus are exposed to more highly-contaminated prey.
- Polar bears and killer whales are two major predators of beluga whales, although neither of these is considered a significant threat to beluga populations as a whole.
- Becoming trapped in ice is not uncommon, and groups of belugas large enough to have an effect on the population can become restricted to small areas by shifting sea ice.
- Climate change resulting in less ice in northern waters could potentially lead to increased fishing and sea traffic, which could threaten belugas with higher levels of pollution, decreased prey, and environmental disturbances.
- o Intensive hunting in certain parts of their range (Canada and Greenland).

Conservation:

- Although it is estimated that there are more than 150,000 belugas worldwide, some subpopulations are endangered. One example of this is the Cook Inlet stock: being isolated geographically as well as genetically, the belugas of this subpopulation are particularly vulnerable.
- Another population, the beluga whales in Bristol Bay, was believed to be approximately 1,000 to 1,500 belugas in the year 1950. Based on aerial surveys it appears the population increased approximately 65% between 1993 and 2005.
- Native subsistence hunting is legal in the United States and Canada as well as Norway and Russia. A few exceptions occur in which hunting is not permitted.

• Our Beluga Habitat:

- Three interconnected areas:
 - > 1- Main habitat: 24 ft. deep (gallery window = 13 in, ballroom window = 8in)
 - ➤ 1- Secondary habitat
 - ➤ 1- Medical pool
- Total water volume: Approximately 800,000 gallons
- Water temperature: ~59°F





- It takes about 90 minutes to filter and cycle the entire exhibit; this is happening continuously at a rate of 9,000 gallons per minute.
- This habitat is compliant with all spatial requirements by APHIS and AMMPA Accreditation.

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Beluga Habitat Information:

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