WALRUSES

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WALRUSES

SCIENTIFIC CLASSIFICATION

A. Order—Pinnipedia.

Pinnipeds are seals, sea lions, and walruses. Some scientists classify the pinnipeds as a suborder of the order Carnivora.

B. Family—Odobenidae.

1. The odobenids share some characteristics with the other two pinniped families. Morphologically, the walrus is more similar to the Phocidae (true seals). Behaviorally, they more closely resemble the Otariidae (eared seals). Several studies based on molecular data have linked the walrus more closely to the otariids, yet the pinniped family that the odobenids are most closely allied to is still in question.
2. Some researchers divide the Odobenidae into two subfamilies: the Odobeninae (living walruses of the genus *Odobenus* and six extinct walrus genera) and the Dusignathinae (four extinct walrus genera).

C. Genus, species—*Odobenus rosmarus*.

1. Most scientists recognize two subspecies of walruses: *Odobenus rosmarus rosmarus* (Atlantic) and *Odobenus rosmarus divergens* (Pacific). *Odobenus* comes from the Greek: "tooth walker," and refers to the walruses' method of pulling themselves up onto the ice with their long tusks.
    a. These two subspecies are physically and reproductively isolated: *O. r. divergens* lives in the Pacific Ocean and *O. r. rosmarus* lives in the Atlantic Ocean.
    b. The Pacific walrus is larger, with longer tusks and a wider skull.
    c. Some scientists recognize a third subspecies of walrus, *Odobenus rosmarus laptevi*, based on specimens in the Laptev Sea in the northern Pacific Ocean. *O. r. laptevi* has skull characteristics similar to the Pacific walrus. Its size is intermediate to the Atlantic and Pacific subspecies.
2. The common name, walrus, originated with the Danish word *hvalros*, meaning "sea horse" or "sea cow." The Russian word for walrus is *morzh*. Arctic natives call the walrus *aivik* (Inuit) or *aivuk* (Yu'pik).

D. Fossil record.

1. The earliest of the odobenid fossils dates back to the middle Miocene, about 14 million years ago.
2. From the fossil record, scientists believe that the Dusignathinae (fossil walruses) were abundant in the North Pacific 11 to 14 million years ago. Unlike the modern walrus with its elongated upper canines (tusks), upper and lower canine teeth of these walruses were about the same size.
3. Scientists theorize that the ancestors of the Odobeninae, or modern walrus, probably made their way from the northern Pacific Ocean to the Atlantic

during the late Miocene, about 6.5 million years ago, by way of a Central American seaway.

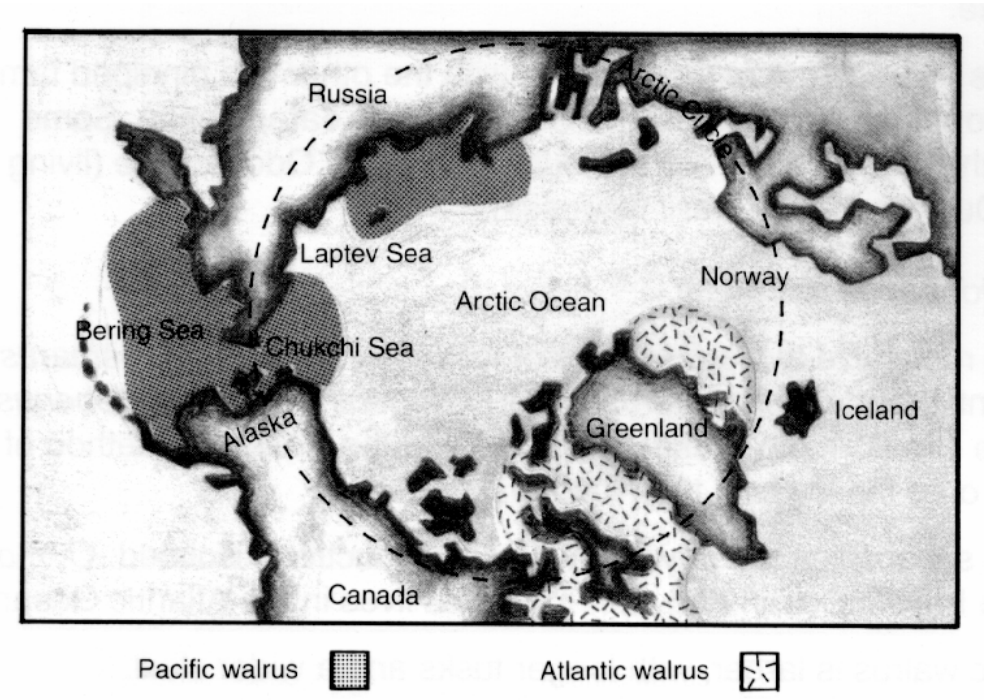
4. Within the last one million years, walruses probably re-entered the Pacific via the Arctic. The modern Pacific walrus originated from the Atlantic stock.

DISTRIBUTION AND HABITAT

A. Distribution.

Walruses are circumpolar, but they are concentrated in geographically separated areas, with little or no chance of interbreeding.

1. Pacific walruses inhabit the Bering, Chukchi, and Laptev Seas.
2. Atlantic walruses inhabit coastal areas of northeastern Canada and Greenland.



Pacific walruses inhabit the Bering, Chukchi, and Laptev Seas, while Atlantic walruses are found in coastal areas of northeastern Canada and Greenland. (The Arctic Circle lies within the dashed line)

B. Habitat.

1. Most walruses live where the air temperature is about - 15° to + 5°C (5°–41°F).
2. Walruses are generally found where the water is no more than 80 m (262 ft.) deep. They prefer a habitat with a gravelly bottom. Walruses spend about two-thirds of their lives in the water.
3. Walruses haul out to rest and bear their young.
    a. Walruses are adapted to a habitat of sea ice and prefer snow-covered moving pack ice or ice floes to land. They haul out on small rocky islands when ice is not present.
    b. Eskimos call a traditional walrus haul-out area an *ooglit*.

C. Migration.
1. The walruses' migration follows the extent of the pack ice. Throughout the year, they occur primarily in or near the southern periphery of the pack ice.
    a. Pacific walruses winter in the central and south Bering Sea and summer in the Chukchi Sea.
    b. Migration of the Canadian population is less well known. They seem to remain in the same general vicinity all year.
2. Walruses migrate primarily by swimming, but they may also ride ice floes.
3. Some walruses migrate more than 3,000 km (1,863 miles) each year.
4. Pacific walrus adult females and young walruses are more migratory than adult males.
    a. Pacific walrus calves are born on the northward migration to the Chukchi Sea.
    b. Several thousand Pacific walrus bulls remain in the south Bering Sea during the summer. When the ice melts, these bulls haul out on islands.
    c. Some researchers have suggested that the hormones that control sperm development may also inhibit migration in adult males.

D. Population.
1. Total world walrus population is about 250,000 animals.
2. The Pacific walrus population is currently unknown but was last estimated at more than 200,000 animals in 1990.
    a. The Pacific walrus population has been hunted to depletion and allowed to recover several times
    b. After the latest population depletion, which began in the 1930s, Pacific walruses were given protection by Russia, the State of Alaska, and the U.S. federal government. This protection led to the eventual recovery of the Pacific walrus population. Walruses reoccupied areas where they had not been seen for several years.
    c. By the early 1980s, walruses appeared leaner. They increased their consumption of alternate foods such as fishes. Natural mortality

increased, and birth rates decreased. This evidence supports the theory that the Pacific walrus population may have approached the carrying capacity of its environment.

d. As the Pacific walrus population grew, annual subsistence catches by indigenous Arctic peoples ranged from about 3,000 to 16,000 walruses per year until about 1990, and then decreased to an average of 5,789 animals per year from 1996 to 2000. Some scientists predict that, without long-term management, natural and human-related mortality factors could rapidly reduce the population once more.

e. Currently the US Geological Survey (USGS) and the Russian Knipovich Polar Research Institute are jointly undertaking a walrus population study. Using infrared imaging they locate walrus groups hauled out on sea ice. High resolution digital photography allows researchers to estimate group numbers. They also use satellite telemetry to estimate the percentage of the population visible during counts.

PHYSICAL CHARACTERISTICS

A. Size.

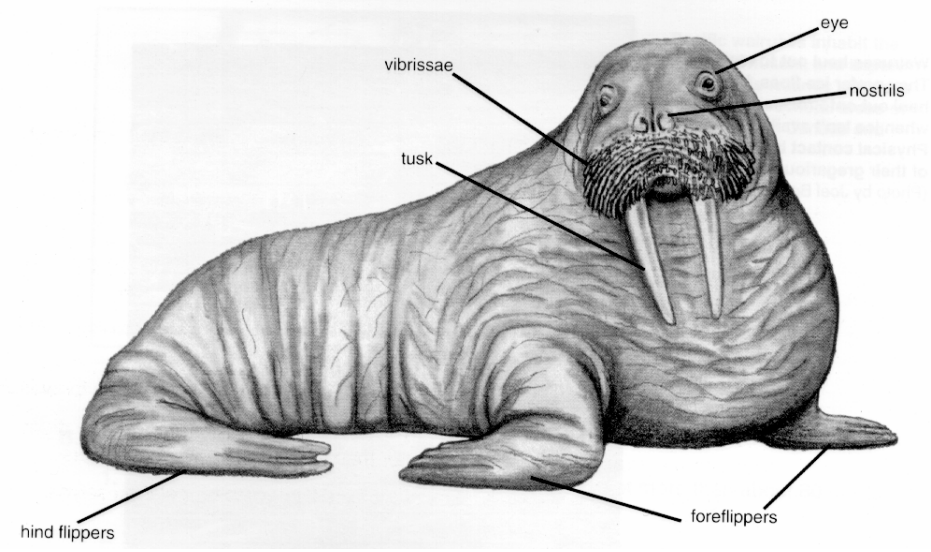
1. Male Pacific walruses weigh about 800 to 1,700 kg (1,764– 3,748 lb.) and are about 2.7 to 3.6 m (9–12 ft.) long.
2. Female Pacific walruses weigh about 400 to 1,250 kg (882–2,756 lb.) and are about 2.3 to 3.1 m (7.5–10 ft.) long.
3. Atlantic walruses are slightly smaller: males weigh about 908 kg (2,000 lb.) and reach lengths of 2.4 m (8 ft.).
4. The northern and southern elephant seals are the only pinnipeds that, when full-grown, can be larger than the walrus.

B. Body shape.

A walrus has a rounded, fusiform body.

C. Coloration.

1. Generally, walruses are cinnamon-brown overall.
2. Walruses appear quite pale in the water; after a sustained period in very cold water, they may appear almost white. They are pink in warm weather when tiny blood vessels in the skin dilate and circulation increases. This increased skin circulation sheds excess body heat.
3. Calves at birth are ash gray to brown. Within a week or two, calves become tawny-brown. The coloration pales with age. In general, younger individuals are darkest.



Walruses are characterized by their large size, by their tusks, and by their numerous vibrissae. The Pacific walrus grows slightly larger than the Atlantic walrus.

D. Flippers.

1. Limbs are adapted as flippers.
2. Flippers are hairless. The skin on the soles of a walrus's flippers is thick and rough, providing traction on land and ice.
3. The foreflippers, or pectoral flippers, have all the major skeletal elements of the forelimbs of land mammals, but are shortened and modified.
    a. A walrus's foreflippers are short and square. Each foreflipper has five digits of about equal length. Each digit has a small and inconspicuous claw.
    b. While swimming, a walrus holds its foreflippers against its body or uses them for steering.
    c. On land, a walrus positions its foreflippers at right angles to the body for walking.
4. Walruses have triangular-shaped hind flippers. Hind flippers have five bony digits. Claws on the three middle digits are larger than those on the outer two digits.
    a. Walruses use alternating strokes of the hind flippers to propel themselves in water.
    b. Like sea lions, walruses can rotate their hind flippers under their pelvic girdle, enabling them to walk on all fours.

E. Head.

1. A walrus's head is square and broad with conspicuous tusks and whiskers.

2. A walrus has about 400 to 700 vibrissae (whiskers) in 13 to 15 rows on its snout. Vibrissae are attached to muscles and are supplied with blood and nerves.

3. Most walruses have 18 teeth. The two canine teeth in the upper jaw are modified into long ivory tusks.

    a. Both males and females have tusks. The tusks of males tend to be longer, straighter, and stouter than those of females.

    b. Tusks erupt during a calf's first summer or fall.

    c. Tusks can grow to a length of 100 cm (39 in.) in males and 80 cm (31.5 in.) in females. Tusks grow for about 15 years, although they may continue to grow in males.

    d. The primary functions of the tusks are establishing social dominance and hauling out onto ice or rocky shores.

4. Eyes are small and located high and toward the sides of the head.

5. Ears, located just behind the eyes, are small inconspicuous openings with no external ear flaps.

6. Paired nostrils are located on the snout above the vibrissae. Nostrils are closed in the resting state.

F. Tail.

Walruses have a tail, but it is usually hidden by a sheath of skin.

G. Skin and hair.

1. A walrus's skin is thick and tough. It may reach a thickness of 2 to 4 cm (0.79–1.6 in). It is thickest on the neck and shoulders of adult males, where it protects the animal against jabs by the tusks of other walruses.

2. The skin of males often has large nodules; these are absent in females. Because the nodules appear at the time of puberty, they are presumed by some researchers to be a secondary sex characteristic.

3. Hair is about 7 to 12 mm (0.3–0.5 in.) long over most of the body. It is shortest on the face and absent on the flippers.

4. Hair is densest on juveniles and becomes less dense with age.

5. Molting.

    a. An annual molt (hair-shedding) for most males takes place from June to August. Females molt over a more prolonged period. Molting in walruses is gradual—individual hairs fall out and are replaced.

    b. Calves shed a fine prenatal coat, called *lanugo*, about two to three months before they are born. They molt again at about one to two months.

SENSES

A. Hearing.

A walrus's hearing is probably sensitive. Eskimos imitating walrus sounds have obtained a response from walruses 1.6 km (1 mile) away.

B. Eyesight.

Researchers believe that the walrus's eyesight is not as sharp as that of other pinnipeds. Because walruses feed on sedentary bottom-dwelling animals, acute vision is not necessary for survival.

C. Tactile.

1. A walrus's skin is thick and not particularly sensitive to touch.
2. Walruses seek out physical contact with other walruses.
3. Vibrissae are extremely sensitive tactile organs. A substantial nerve system transmits tactile information from the vibrissae to the brain. Studies indicate that walruses are able to discriminate the shape and size of an object using their vibrissae.

D. Taste

Walruses prefer certain foods, but researchers do not know how acute the sense of taste is or how important it is in food preference. Walruses have fewer taste buds on their tongues than land mammals. However the taste buds that walruses do have are larger than those of other mammals.

E. Smell.

The sense of smell in air is well developed. It probably functions mainly in mother/calf recognition, for sensing approaching predators, or for sensing other walruses while hauled-out.

ADAPTATIONS FOR AN AQUATIC ENVIRONMENT

A. Swimming.

1. Normal swimming speed for walruses is about 7 kph (4.3 mph). They are capable of short bursts of up to 35 kph (21.7 mph).
2. Most propulsion comes from alternate strokes of the hind flippers. Foreflippers also work with the hind flippers for maneuvering.

B. Diving.

1. Walruses generally breathe at the surface for about one minute after every five to eight minutes of subsurface activity. They can stay submerged for as long as 10 minutes.
2. A walrus's bottom-dwelling prey usually inhabit waters no more than about 80 m (262 ft.) deep: a walrus generally dives no deeper than this. Deeper dives, however, have been documented. When the stomach contents of one individual were examined, researchers concluded that the walrus dove to at

least 91 m (299 ft.). Another observation confirmed a dive of 113 m (371 ft.) and submersion time of 25 minutes.

3. All marine mammals have special physiological adaptations for diving. These adaptations enable a walrus to conserve oxygen while it is below water.

    a. The heart rate slows during a dive.

    b. When diving, blood is shunted away from tissues tolerant of low oxygen levels toward organs where oxygen is needed, such as the heart and brain.

    c. The muscle of walruses has a high content of the oxygen-binding protein myoglobin, which transports and stores oxygen.

    d. Pharyngeal muscles prevent water from entering the trachea when a walrus opens its mouth below water.

C. Respiration.

A walrus breathes through its nostrils and through its mouth.

D. Thermoregulation.

1. Heat loss in water is 27 times faster than in air.

2. A walrus's core body temperature is about 36.6°C (97.9°F). There is a heat gradient throughout the blubber to the skin. The skin stays about 1 to 3°C (1.8–5.4°F) warmer than the water.

3. From about -20 to 15°C (-4–59°F) a walrus's metabolism doesn't change, and the temperature doesn't appear to affect the walrus's behavior.

4. Walruses can withstand even cooler temperatures; they have been observed at -35°C (-31°F).

5. In cold water, blood is shunted inward as blood vessels in the skin constrict, reducing heat loss to the environment. The skin appears pale, almost white.

6. When warm, blood vessels in the skin dilate (expand), releasing heat into the environment. The skin appears pink.

7. When air temperatures rise above 15°C (59°F), walruses often stay in the water to stay cool.

8. Walruses deposit most of their body fat into a thick layer of *blubber* — a layer of fat reinforced by fibrous connective tissue that lies just below the skin of most marine mammals. This blubber layer insulates the walrus and streamlines its body. It also functions as an energy reserve. Blubber may be up to 10 cm (3.9 in.) thick. During the winter, blubber may account for one third of a walrus's total body mass.

9. Walruses seek out physical contact with other walruses. This helps walruses retain body heat rather than lose it to the external environment. Physical contact is also indicative of their gregarious nature.

BEHAVIOR

A. Social structure.

1. Walruses are among the most gregarious of animals. They exhibit social behavior all year and congregate by the hundreds. Walruses haul out in herds; they seldom haul out alone.
2. Males and females form separate herds.
3. Social dominance is well established in herds and subgroups. Dominance in herds is established by tusk length, body size, and aggressiveness. The largest walruses with the longest tusks are the most aggressive and generate threat displays most often. Smaller walruses, and those with smaller or broken tusks, have a lower social ranking.

B. Social behavior.

1. Walruses use their tusks in dominance displays and as weapons.
2. A male will fight if another male intrudes upon him during a courtship display. These fights often result in physical injury. The frequent scars and lacerations seen on the necks and shoulders of adult males after the breeding season are evidence of tusking.
3. Individuals frequently compete for the most favorable haul-out sites.
4. Males produce bell-like sounds and other vocalizations as part of a courtship display.

C. Hauling out.

1. Walruses haul out on ice or land to rest and care for their young. They use their tusks to help them haul out.

COMMUNICATION

A. Sound production.

1. Walruses have vocal cords.
2. Walruses produce sounds both above and below water.
3. Walruses are among the most vocal of the pinnipeds. They produce growls, taps, knocks, grunts, barks, soft whistles, rasps, and clicks.
4. Male walruses produce bell-like sounds below water. These sounds are not produced by the vocal cords but originate from air sacs, which extend from the pharynx.
5. Calves bellow if disturbed.
6. Adults engaged in dominance conflicts may snort, cough, or roar.

B. Display behavior.

1. Walruses communicate through auditory and visual displays.

2. During courtship, males display visually and vocally from the water. Stereotyped sequences of sounds occur both above and below water. Underwater sounds include clicks or knocks, bell-like sounds, and taps. Above-water sounds include teeth clacking and whistles. Courtship displays continue until a female physically contacts a displaying male in the water.

3. Males engage in tusk-threat displays to establish dominance.

C. Other communication.

1. Walruses communicate through sound, sight, touch, and smell.

2. Tactile communication occurs through body contact.

a. Walruses haul out in herds in close contact with one another.

b. A mother shelters her calf under her chest between her foreflippers. A calf often rides on its mother's back in the water.

c. Adults engaged in dominance conflicts may strike each other with their tusks.

FOOD AND FORAGING

A. Food preferences and resources.

1. Walruses prefer molluscs—mainly bivalves such as clams. They also eat many other kinds of benthic invertebrates including worms, gastropods, cephalopods, crustaceans, sea cucumbers, and other soft-bodied animals. Walruses may occasionally prey on fishes such as polar cod.

2. Walruses may eat the carcasses of young seals when food is scarce.

3. There are some rare but habitual seal-eating walruses. Their diet consists mainly of ringed and bearded seals. These are usually male walruses, recognizable because they are usually larger than other males, with powerful shoulder and chest muscles. Their skin may become grease-stained from the blubber of the seals they prey on.

B. Food Intake.

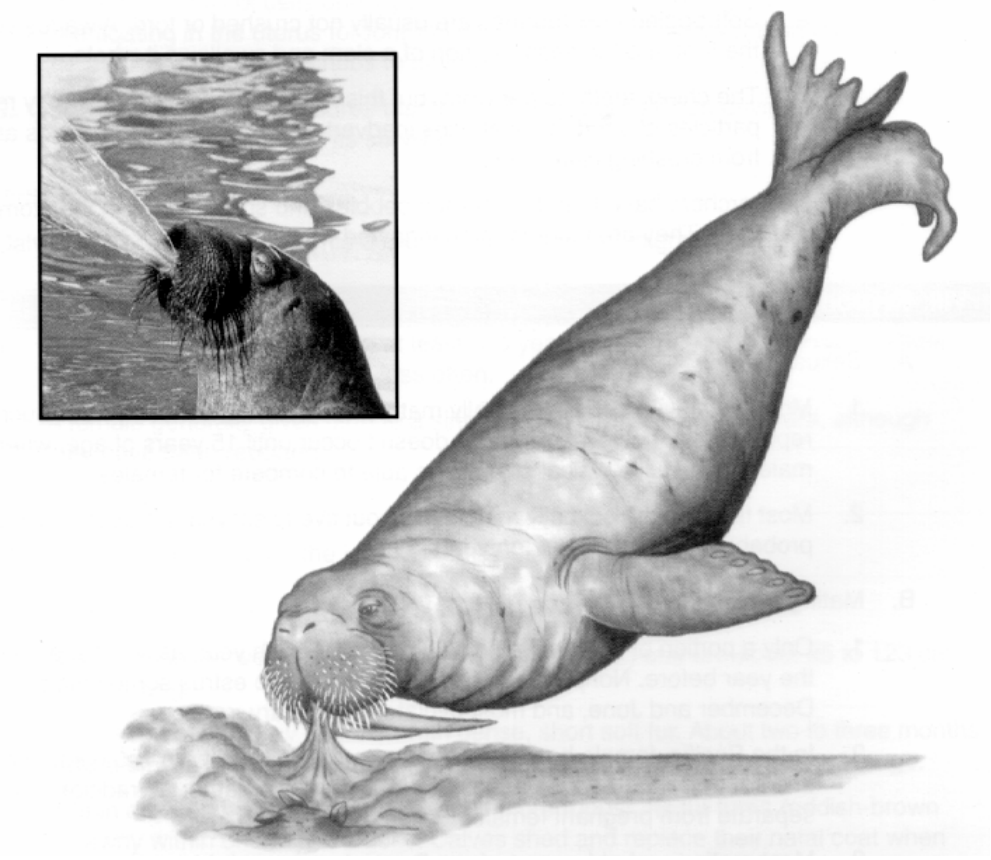
1. Adult walruses eat about 3% to 6% of their total weight per day. 2. Adults may eat as many as 3,000 to 6,000 clams in a single feeding session.

3. Observations of feedings indicate that walruses usually fill their stomachs twice daily.

4. In the summer months, and during the southward migration in the fall, walruses spend most of their day foraging. They eat less on their northward migration in the spring. Food intake for mature male walruses dramatically decreases during the breeding season and probably for a shorter time for females in estrus. Pregnant females increase food consumption about 30% to 40%.

C. Methods of collecting food.

1. Walruses usually forage on the bottom within 80 m (262 ft.) of the surface. Most feeding probably takes place between 10 and 50 m (33–164 ft.).
2. Because visibility is poor in deep and murky waters, walruses rely on their vibrissae to locate food. A walrus moves its snout along the bottom, rooting through the sediment and using its vibrissae to help detect prey. Abrasion patterns of the tusks show that they are dragged through the sediment, but are not used to dig up prey.
3. In addition, researchers have seen foraging Atlantic walruses rapidly waving a foreflipper to uncover prey from the sediment. The walruses that were observed, preferentially used their right flipper when foraging this way.
4. Evidence shows that walruses may take in mouthfuls of water and squirt powerful jets at the sea floor, excavating burrowing invertebrates such as clams.
5. Walruses do not chew their food, but they do sometimes crush clam shells.
    a. Soft-bodied invertebrates are usually not crushed or torn. A walrus sucks off the foot and the fleshy siphon of a clam and swallows it whole.
    b. The cheek teeth do get worn, but this is probably from abrasion by minute particles of sand that walruses inadvertently take into their mouths and not from crushing clam shells.
6. Researchers have found numerous pebbles and small stones in the stomachs of walruses. These are thought to be ingested while feeding.



Above: **A walrus squirts a powerful jet of water at the sea floor to excavate burrowing invertebrates.**
Insert: **At SeaWorld a walrus demonstrates water-squirting behavior above water**

REPRODUCTION

A. Sexual maturity.

1. Most male walruses are sexually mature at about eight to ten years. Successful reproduction, however, probably doesn't occur until 15 years when a male attains full physical size and is able to compete for females.
2. Most females are sexually mature at about five to six years. Successful reproduction probably begins at about ten years.

B. Mating activity.

1. Only a portion of the female population mates each year, as some are pregnant from the year before. Non-pregnant females may go into estrus some time between December and June and most ovulate in February.
2. In the Pacific, female herds meet male herds as they move south into the central and south Bering Sea in January. Estrous females gather in herds separate from pregnant females and are attended by males displaying nearby in the water.
3. Most mating probably occurs from December through March, when most sexually mature males produce viable sperm. Mating takes place off the pack ice, underwater and remote from shore; breeding locations are thus largely inaccessible for observation.
4. Each herd of estrous females is attended by one or more large adult males. According to one study, the ratio of males to females averaged 1 to 23.
    a. Males display visually and vocally from the water while the females rest. A display occurs both at and below the surface and lasts about two to three minutes. The males' displays include clanging bell-like sounds, pulses, and clicks under water, and teeth clacking and whistles at the surface.
    b. Bulls either maintain a distance of about 7 to 10 m (23-33 ft.) or fight violently with each other. When displaying males are present, subadult males are scarce or absent. Those present remain on the fringes of the group and do not display.
    c. Females leave the ice to join a displaying male in the water, where copulation takes place.
5. After the mating season, mature bulls return to all-male herds.

C. Gestation.

1. Total gestation is 15 to 16 months.
2. Gestation includes a period of delayed implantation. The fertilized egg divides into a hollow ball of cells one layer thick (*blastocyst*), and then it stops

growing and remains free-floating in the uterus for four to five months. The blastocyst then implants on the uterine wall and continues to develop.

3. Delayed implantation allows the mother time to recover from her last pregnancy and devote her energy to nursing and caring for her calf. It also ensures that the calf will be born when environmental conditions are optimal for its survival.

B. Birth.

1. Calves are born mid-April to mid-June, during the northward migration.
2. Calves are usually born on the ice.
3. A female generally gives birth to a single calf at a time. Twins are rare, although they have been reported.
4. Newborn calves weigh about 45 to 75 kg (99–165 lb.) and are about 95 to 123 cm (3–4 ft.) long.
5. Calves are ashen gray to brown with dense, short soft fur. About two to three months before birth, the calf sheds a fine white layer of soft fetal hair called *lanugo*.
6. Within days or weeks, the calf becomes more robust. Its fur turns reddish-brown to tawny within one to two weeks. Calves shed and replace their natal coat when they are one or two months old. This first molt is usually completed by August. Calves then molt annually.

C. Care of the young.

1. Nursing.
    a. Nursing usually takes place in the water, but calves sometimes nurse while the mother-calf pair is hauled out on ice or land.
    b. The calves accompany their mothers on foraging trips, and nurse on demand during these trips.
    c. Walrus milk is about 30% fat, 5% to 10% protein, and 60% water. The composition of milk remains relatively constant throughout the nursing period.
    d. Milk is occasionally supplemented with a small amount of solid food as early as six months of age.
    e. Most calves nurse for about two years. Some calves have nursed even longer if the mother does not have a new calf.
    f. In a zoological habitat, calves nurse about six to ten times per day. Orphaned calves are fed a formula of cream, ground fish and clams, milk replacer (Multi-milk®), vitamins, and water. They consume up to 9 liters (300 oz.) per day. There is no information available on the frequency of nursing or the volume of milk consumed by a calf in the wild.

2. Cows with calves more than two days old tend to gather in herds separate from the bulls and other females. These "nursery herds" usually include 20 to 50 individuals but may include as many as 200.

3. A cow is extremely protective of her calf. She defends and protects her calf and may shelter it under her chest between her foreflippers. Calves often ride on their mothers' backs in the water.

4. There is some evidence that females may care for orphans, although it is unknown whether the female nurses the orphan.

D. Calf growth and development.

1. The calf grows about 10 to 15 cm (4–6 in.) in length each month. In a zoological environment, a calf gains 0.7 to 0.9 kg (1.5–2 lb.) per day. Males grow slightly faster than females.

2. By one month of age calves are strong swimmers.

3. A pregnant, near-term cow and her calf from the previous pregnancy usually separate in late April, just before the new calf is born. Mother and calf stay together two years or longer if the mother doesn't produce another calf. Females usually remain with their mother's herd. Young males may stay an additional two or three years before joining an all-male herd.

LONGEVITY AND MORTALITY

A. Longevity and aging.

1. Walruses live to a maximum of about 16 to 40 years. (Nowak, 1999)

2. As a walrus ages, it periodically produces growth layer groups of dental material. Age can be estimated by examining a sliced section of a cheek tooth and counting these layers.

B. Predators.

1. Polar bears occasionally prey on walrus calves and probably eat dead walruses. Walruses are not a main part of the polar bears' diet.

2. Killer whales may prey on walrus calves and injured adults.

C. Hunting.

1. Walruses have been hunted commercially for their meat, skin, and ivory tusks by traders from Norway, Russia, Great Britain, Greenland, Canada, and the United States. Since the mid-1800s walrus populations have been severely depleted and allowed to recover three times. Researchers attribute this cycle of exploitation to a lack of communication and monitoring of harvests between the nations. Going largely unnoticed, many walrus populations were nearly wiped out before efforts were made to preserve them. Most walruses are hunted at sea.

2. Indigenous Arctic peoples of the U.S., Canada, Greenland, and Russia subsistence hunt walruses for their meat, hide, ivory (from the tusks), and other raw materials.

    a. Walrus hunts are an important part of the culture and tradition of many indigenous Arctic cultures.

    b. The combined U.S. and Russian subsistence harvest of walruses has averaged about 7,334 walruses per year for the past 40 years.

    c. In Alaskan waters, subsistence take has significantly decreased to an average of 4,869 per year since the 1990's. Scientists estimate that, each year, an average of 42% of walruses that are struck by bullets are lost before they can be recovered by hunters. With this struck and lost percentage factored in, Alaskan walrus mortality due to hunting averages 5,794 walruses per year.

D. Disease and parasitism.

Walruses are susceptible to a number of viruses, internal and external parasites, and to microbial infections of the skin and internal organs.

E. Intraspecific causes of death.

1. Many males die annually from injuries incurred while fighting during breeding seasons.

2. Calves may be accidentally crushed by adults.

CONSERVATION

A. Legal protection for walruses.

1. Commercial walrus hunting was banned in Canada in 1931. A U.S. Department of Commerce regulation in 1937 and The Congressional Walrus Act of 1941 banned all U.S. commercial hunting, allowing only native subsistence hunting.

2. The U.S. Marine Mammal Protection Act (MMPA).

    a. The U.S. Marine Mammal Protection Act (MMPA) of 1972 made it illegal to hunt or harass any marine mammal in U.S. waters.

    b. The MMPA does allow for certain exceptions: native subsistence hunting; collecting or temporarily restraining marine mammals for research, education, and public display; and taking restricted number of marine mammals incidentally in the course of fishing operations.

    c. The primary objective of the MMPA is to maintain the health and stability of the marine ecosystem and to obtain and maintain an optimum sustainable population of marine mammals.

    d. According to MMPA, all walruses in U.S. waters are under the jurisdiction of the U.S. Fish and Wildlife Service.

3. IUCN/The World Conservation Union.

IUCN/The World Conservation Union is a worldwide conservation organization. This organization links together government agencies, non-government agencies, and independent states to encourage a worldwide approach to conservation. The walrus is listed in the IUCN/The World Conservation Union's *lower risk/least concern* category.

4. The Convention in International Trade of Endangered Species (CITES) is an international treaty developed in 1973 to regulate trade in certain wildlife species. Walruses are listed under CITES Appendix III, at the request of Canada. Appendix III species are included at the request of a nation that already regulates trade in the species and that needs the cooperation of other countries to prevent unsustainable or illegal exploitation. International trade in specimens of species listed in this Appendix is allowed only on presentation of the appropriate permits or certificates.

B. SeaWorld & Busch Gardens Conservation Fund

1. The non-profit SeaWorld & Busch Gardens Conservation Fund (SWBGCF) works on behalf of wildlife and habitats worldwide. The goal of the SWBGCF is to encourage sustainable solutions by supporting critical conservation initiatives worldwide.

   a. The SWBGCF conducts grant awards twice each year and anticipates funding for 2005 to approach $700,000. Selected projects must be science-based, solution-driven and community-oriented—attributes needed to achieve effective and long-term conservation success. Groups working on walrus conservation projects are invited to apply for a SWBGCF grant. Projects are carefully selected by a diverse mix of wildlife experts, scientists, business leaders and educators.

   b. The SWBGCF accepts donations to support conservation projects in the U.S. and around the world. 100% of donations go directly to selected projects.

2. Scientists continue to study walruses.

C. Marine zoological parks.

1. Having walruses at marine zoological parks provides the opportunity for the public to learn, up-close, about these animals and how human activities may impact their survival.

2. In the protected environment of a marine zoological park, scientists can examine aspects of walrus biology that are difficult or impossible to study in the wild.

3. SeaWorld occasionally cares for orphaned walrus calves with the permission of the U.S. Fish and Wildlife Service.