



Physical Description:

Orcas, or killer whales, are the largest of the dolphin family. The species exhibits sexual dimorphism with males larger than females. Males reach a maximum length of 32 feet (average around 26 feet), have a dorsal fin up to six feet high, and weigh eight to nine tons. Females have a dorsal fin up to three feet, can reach a maximum length of up to 28 feet (average around 23 feet), and weigh up to four tons. Orcas are known for their distinctive black and white coloring.

Photo Identification Methods:

Orcas can be individually distinguished by a combination of factors, including familial groupings, size & shape of dorsal fin, and shape of the saddle patch behind the dorsal fin which differs on right and left sides. There are three types of saddle patches: closed, open, and finger.

Natural History:

Species Subtypes:

Orcas are recognized to have distinct populations as well as different ecotypes (“forms” or “species subtypes”) worldwide. There are three orca ecotypes found here in the Salish Sea:

Offshores - not discovered until the mid-1990s. Offshores get their name because they often are found more than nine miles offshore. Not a lot is known about this group as they are rarely seen in the Salish Sea. They are smaller in size than transient or resident orcas and their dorsal fins tend to be more nicked and notched.

Transients - originally given this name as it was believed they had no “home” waters, but tended to roam through a range of areas. However, over the last 15 years, the transient community of orcas have been seen throughout the year in the Salish Sea, from deep in Puget Sound to north to the Campbell River, Canada and further. In fact, transients are now sighted more frequently than resident orcas in local, inland waters. This community of transients was renamed Bigg’s killer whales, in honor of Dr. Michael Bigg, the founder of modern killer whale research. The name is becoming accepted and widely used for this population of transient orcas. Typically, transients travel in small familial groups of up to 7 members, but frequently join together to form large groups. For identification purposes, all transients are designated with the letter ‘T’. They are given ID numbers, with offspring adding the mothers number and a letter to identify the calf (ex - mother may be T100, offspring would be T100A, T100B, etc). In general, transients tend to be bigger than residents or offshores, have a more sharply pointed tip to their dorsal fin than residents or offshores, and have closed saddle patches (solid in color or no black inside).

Residents – once the most commonly encountered group in the Salish Sea, so named due to their regular appearance in local waters between April and November. There are two populations of residents in the North Pacific. Their ranges overlap but they are generally identified by summer

core areas: *Northern Residents* (above Georgia Strait northward) and *Southern Residents* (Fraser River south). There are also several Alaska resident pods.

These three ecotypes differ in appearance, diet, behavior and vocal repertoire. The Northern Resident population consists of three different acoustic clans, while the Southern Residents are all part of the same acoustic clan. There is no known breeding between any of these separate ecotypes. In the Pacific US, there are eight recognized stocks of orcas based on association patterns, acoustics, movements, genetic differences, and potential fishery interactions:

- Eastern North Pacific Alaska Residents
- Eastern North Pacific Northern Residents
- Eastern North Pacific Southern Residents
- West Coast Transients
- Gulf of Alaska, Aleutian Islands, and Bering Sea Transients
- AT1 Transients
- Eastern North Pacific Offshores
- Hawaiian

Around the waters of Washington State, the specific stocks of orcas we encounter are: Eastern North Pacific Southern Residents, West Coast Transients, and Eastern North Pacific Offshores.

Reproduction:

Orcas mate and reproduce at any time of year. Females are generally sexually mature in their early teen years and males in their late teen years, although research and observation suggests that it is the older males who may be fathering the majority of the calves. The gestation for an orca is 16 to 17 months and nursing takes place for 18 months to 2 years. Orca calves are approximately six to seven feet long and 400 pounds at birth. In general, orcas mate outside their pods to avoid inbreeding and to increase genetic diversity. However, recent genetic research has shown that there is mating happening within Southern Resident pods (inbreeding). This is likely due to a low population size.

Life Cycle:

The life cycle for orcas is very similar to humans – they are mature around the same age, females are reproductive for the same number of years and even undergo menopause, and they can potentially live up to 100 years or longer. Resident orca offspring remain with their mothers throughout their lifetimes, although the fathers are largely unknown. Pods are generally comprised of matrilineal - related females and their descendants.

Range:

Orcas are found in every ocean and they are the second most widespread mammal in the world, second only to humans. Some of the most studied orcas include the Southern and Northern Residents, Transients, Alaska, and Antarctic populations. Eastern North Pacific Offshores can be found from southern California waters north to the Aleutian Islands. West Coast Transients range from Southeast Alaska to California. Southern Residents have been seen as far north as SE Alaska and as far south as Monterey Bay, California. While Southern Residents used to spend significant time during the summer months in the inland waters around San Juan Island foraging, this has significantly changed in recent years, most likely due to food supply. Residents are increasingly visiting later, less frequently, and spending less time when here, in the waters around the San Juan Islands. They spend more time now further south along the Washington and Oregon Coast as well as off the west side of Vancouver Island.

Diet:

Diets vary greatly according to ecotype. Offshore orca diet is not completely known at this time but appears to be mostly fish. They are known to eat Pacific sleeper sharks. Transients are marine mammal feeders, preying on porpoise, dolphins, seals, sea lions, and even other whales. Resident orcas feed

almost exclusively on salmon. Research indicates that they eat primarily Chinook, with some chum and coho at certain times of the year. Pink and sockeye salmon do not appear to be important components of their diet. Estimates range on amounts required, with males eating up to 400 pounds a day, and females eating up to 200 pounds a day. While they do not appear to ever eat marine mammals, on occasion, Southern Resident orcas are observed killing porpoises and other marine mammals for unknown reasons.

Status:

The current population of Eastern North Pacific Offshores is believed to be approximately 300 whales. The West Coast Transient population has grown steadily over the last 40 years, doubling since 1990 to a 2018 total of over 500 individuals. A subset of this population (approximately 350 individuals) has been identified as more likely to occur within coastal waters. Within this subset, there were 112 births and 27 deaths from 2012 to the end of 2018, resulting in a greater than 4% growth rate. While not all these whales use the Salish Sea on an annual basis, well over 200 individual whales in at least 50 different matrilineages currently use the region on a regular basis. Currently the Northern Resident population numbers around 300 animals and is listed as Threatened in Canada. The Northern Resident population has grown since the 1970s. Since 2002, the population has experienced an average annual growth rate of 2.9%.

Historically, the Southern Resident orca population was at least 140 individuals. The population suffered significant losses in the 1960s through the mid-1970s. Once protections were put in place, there was some growth in the population in the 1970s and 1980s, with a peak of 98 animals in 1995. However, the population experienced a decline of almost 20 percent in the late 1990s, leaving 80 whales in 2001. The population census at the end of 2016 counted only 78 whales. Currently, this population consists of less than 75 individuals and they are listed as endangered under SARA (Species At Risk Act) in Canada, and under the Endangered Species Act in the U.S. Southern Resident orcas were additionally identified in 2016 by NOAA as one of eight “Species in the Spotlight” that are most at-risk of extinction. It’s worth noting that the AT1 Transient stock is already considered “functionally extinct” and is currently listed as depleted by NOAA under the Marine Mammal Protection Act. This stock went from 22 whales in 1989 to only seven whales by 2003. A decline of 68%. Most of the mortality happened, between 1989 and 1990 as a result of the Exxon Valdez Oil Spill.

Threats:

Historical: In the early 1900s, orcas in the Pacific Northwest were shot regularly due to fear of the animal and perceived competition for salmon. In the 1960s and 1970s, beginning with the captivity of Namu at the Seattle Marine Aquarium, many orcas in the Pacific Northwest were captured for display. In one decade, 45 orcas were removed from the Southern Resident community, amounting to possibly 1/3 of the population. The captures ended in 1976.

Current: There are three main identified threats to orcas in the Pacific Northwest: toxins and contaminants, lack of prey, and the potential for boat disturbance.

Toxins and contaminants: Pacific Northwest orcas are considered some of the most toxic marine mammals in the world. They have been shown to carry high levels of PCBs, DDT, PBDEs, and Dioxins, among other toxins. These persistent chemicals settle in the blubber layers of the whales and are metabolized when the animals become food deprived. The toxins are hormone mimickers, disrupting the immune and reproductive systems of the animals. Female orcas tend to ‘offload’ some of their toxins into their calves, while males accumulate the toxins throughout their lifetimes. While females naturally live longer than males even in healthy populations, this difference in toxin load could be contributing to a wider range in lifespans between the two sexes.

Lack of prey: Recent research has shown that Southern Resident orcas show a strong preference for Chinook salmon, another endangered species. The Chinook salmon population has decreased by over 90% in the last century due to overfishing, dams, and habitat destruction. Climate change is a new threat to salmon survival. It is unknown why Southern Residents exhibit such a preference for one prey species although it is likely due to the fact that Chinook contains the most calories, fat and nutrition, therefore supplying the most ‘bang for the buck’.

Potential for boat disturbance: Although more research is necessary to determine the extent of disturbance, studies suggest that boat noise and fish finders at certain distances could disrupt the echolocation and vocalization abilities of the orcas. In 2007, San Juan County placed an ordinance making harassment of SRKWs a finable offense and setting distance limits by boat. In 2008, this ordinance was adopted by the State of Washington, adding a layer of protection on top of the ESA listing. Federal regulations for killer whale viewing in Washington State were enacted in 2011 increasing the distance requirement to 200 yards. These regulations were made stricter in 2019. All vessels now must stay 300 yards from Southern Resident orcas on either side, stay 400 yards out of Southern Resident orca’s path/in front and behind the whales; go slow (<seven knots) within ½ mile of Southern Resident orcas, and disengage engines if whales appear within 300 yards. In 2019, Canada also updated their vessel regulations similarly throughout the critical habitat of the Southern Resident orcas. Their laws now require all recreational boats and whale watching vessels to stay at least 400 meters away from all orcas, with exception for commercial whale watching companies who have obtained authorization from the Minister of Transport to approach Transient orcas up to 200 meters. Vessels are also asked to reduce their speed to less than seven knots if they are within 1,000 meters of orcas in certain areas, and to turn off their echo sounders and turn engines to neutral idle if a whale is within 400 meters. It should be noted that most commercial whale watching companies belong to the Pacific Whale Watch Association which has developed a standard of behavior around orcas, intended to reduce potential vessel effects. Soundwatch, a Whale Museum program, monitors vessels around whales and educates boaters on responsible whale watching practices.

To help address these threats, a Southern Resident Killer Whale Recovery Task Force was formed in Washington State in 2018 which submitted comprehensive reports and recommendations to the Governor of the State. These recommendations directly led to Governor Inslee announcing an unprecedented financial investment in the State’s 2019-21 budget to save Southern Resident orcas and complement efforts to recover salmon. These recommendations also led to five orca recovery bills signed into law in the State of Washington to further protect Southern Resident orcas, including the updates to vessel regulations mentioned above. In 2018, NOAA (in collaboration with WDFW) issued a paper on priority Chinook salmon stocks for the Southern Resident orcas. The prioritization will inform salmon recovery actions such as habitat restoration and perhaps production of fish at hatcheries, which are designed to increase the abundance of salmon overall. In 2019, NOAA additionally opened public comments to revising the critical habitat designation for the Southern Residents by expanding it to include six new areas along the U.S. West Coast, while maintaining the whales’ currently designated critical habitat in inland waters of Washington.

Fun Facts:

- The resident orcas were first given their numerical identifications by Canadian researcher Michael Bigg. His legacy is Mike (J-26).
- Typically, Southern Residents do three dives with a 15-20 second interval, followed by a longer dive of 2-3 minutes.
- Southern Residents are designated by a letter/number combination as well as by a name. The letter/number combination is assigned by the Center for Whale Research, while the names are given by The Whale Museum’s Orca Adoption Program.

- One of the first orcas to be given a name was Ralph (J-6). He was named after Ralph Munro, former Washington Secretary of State and a leading advocate for whales. The first orca adoption was also of Ralph (J-6), given to Ralph Munro on behalf of the people of the State of Washington.
- The longest known life of an orca is Granny (J-2), estimated by the Center for Whale Research to be 105 years old at the time of her death in 2016!
- Some orca populations are known to steal fish from long lines.

Sources:

The Whale Museum's Science Lecture Series

Center for Whale Research

Orca Network

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