

2015 Whale Sightings in the Salish Sea

Central Salish Sea and Puget Sound

For the past year, in a collaborative effort involving the Center for Whale Research (CWR), its staff and volunteers, Orca Network through its sighting network, the Pacific Whale Watch Association, and Sooke Coastal Explorations, there has been an effort to document the presence and distribution of whale species in the central Salish Sea and Puget Sound (Figure 1; sample daily map in Figure 2). The species and ecotypes of interest naturally included the endangered Southern Resident killer whales, transient or Bigg's killer whales, minke whales, gray whales, and humpback whales. An unexpected visitor, quickly identified as a fin whale, was added to the list after a number of sightings later in the year. In November of 2015, some of the Northern Resident killer whales made an even more rare appearance in the Strait of Juan de Fuca.

What follows is a summary of the sighting information that has been reported and made available for this project. This is a “citizen science” compilation of habitat use by these species and ecotypes throughout 2015. The report is intended to promote an awareness of the species and ecotypes that use the Salish Sea, and to encourage citizens to actively participate in efforts to protect and improve their habitat. With the exception of minke whales and gray whales, all of the above whale species and ecotypes share something in common: they are listed as being either threatened or endangered in the US and/or Canada. Minke whales are “not listed”, and gray whales are a species of special concern in Canada (“delisted” in the US).



Figure 1. Map of the Salish Sea & Surrounding Basin, Stefan Freelan, WWU, 2009

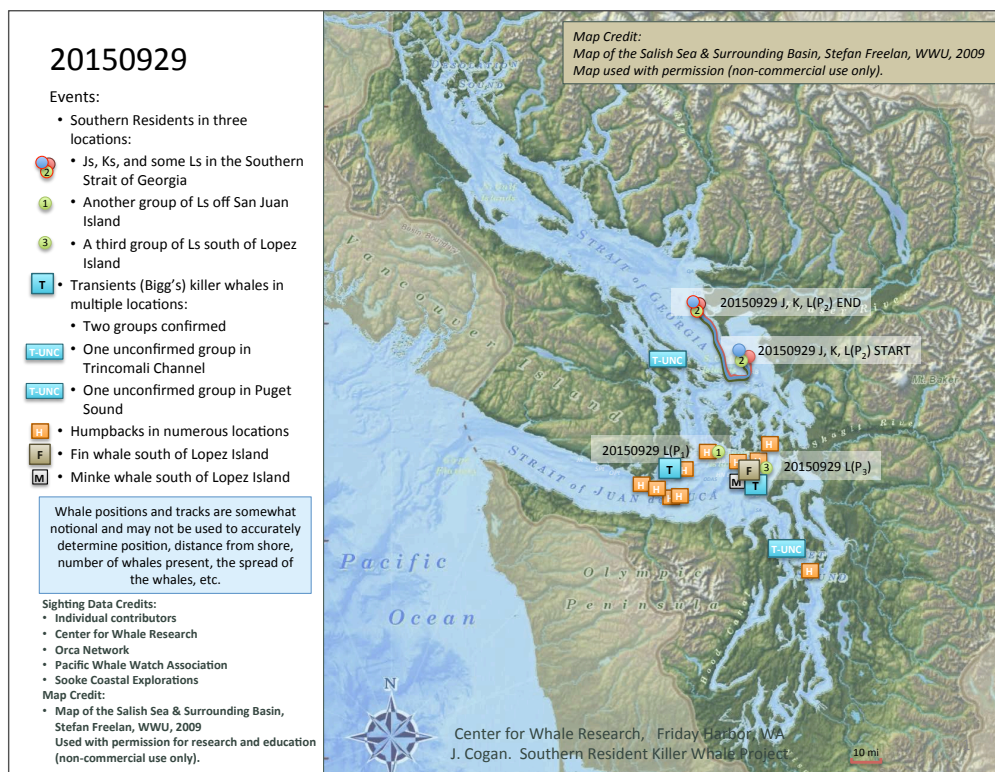


Figure 2. Sighting Map for September 29, 2015

A note about the map:

Stefan Freelan, creator of the Salish Sea map, has graciously allowed use of his map for this project.

A note about the report:

This report is intended to promote an interest in conservation of these species and stewardship of their environment. Neither this report nor the information included in this report may be used for commercial purposes, including advertisement as well as fundraising by organizations other than the **Center for Whale Research**.

Whale Species: Sightings Reported in 2015 Central Salish Sea and Puget Sound

Although the central Salish Sea and Puget Sound are well known as the home of the endangered Southern Resident killer whales, in 2015, more than 2100 unique sightings were recorded and compiled for whales other than Southern Residents. The graph shown below depicts the number of days each of the following whale species and ecotypes were reported in the central Salish Sea and Puget Sound:

- Southern Resident killer whales (SRKW);
- Transient or Bigg's killer whales (TKW);
- Humpback whales;
- Minke whales;
- Gray whales;
- Fin whale; and
- Northern Resident killer whales (NRKW).

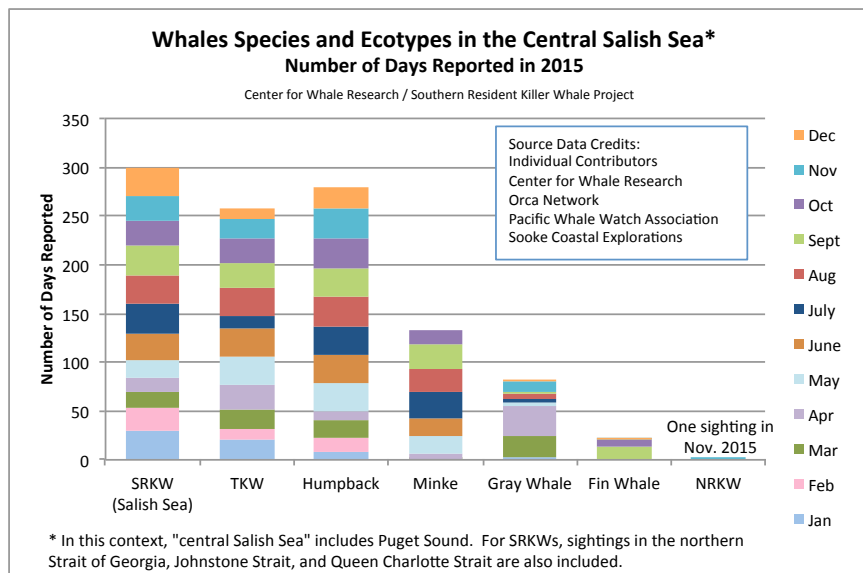


Figure 3. Whale Species and Ecotypes Reported in 2015
(Central Salish Sea and Puget Sound)

In 2015, Southern Resident killer whales, transient (Bigg's) killer whales, and humpback whales were regularly sighted in the central Salish Sea and Puget Sound. There were only a few days with no sighting reports for any of the whales listed. Details are provided in subsequent sections.

Sighting Data Credits and Acknowledgments

This report would not have been possible without the support of the following:

- **Individual contributors**
 - Special thanks to **Mark Malleson** and **Melisa Pinnow**.
- **Center for Whale Research**
- **Orca Network**
- **Pacific Whale Watch Association**
- **Salish Sea Hydrophone Log**
- **Sooke Coastal Explorations**

Thanks also to **Jared Towers** for his assistance.

Here are some tips for boaters who visit this area, and for those who wish to see these whales in the wild.

Whale Watching from Land

Puget Sound offers many shore-based viewing opportunities. For more information, contact Orca Network or The Whale Trail.

The west side of **San Juan Island** also offers shore-based viewing opportunities from the Land Bank, Lime Kiln State Park, and the San Juan County Park.

Whale Watching by Boat*

On any given day in the Pacific Northwest, boaters may encounter one or more of these whale species. At all times, be alert and watch for blows and dorsal fins. If there is one whale visible, there may be more nearby. Be respectful of the whales and their needs by giving them space, and by keeping engine noise to a minimum (*"if you see a blow, go slow"*). Most of the whales seen in these waters are either threatened or endangered in the US and/or Canada.

Both private boaters* and commercial whale watch operators are subject to **whale watching regulations and guidelines** in both the **US** and **Canada**. In the **US**, please refer to the **Be Whale Wise** guidelines:

<http://www.bewhalewise.org>

In **Canada**:

<http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/mammals-mammiferes/view-observer-eng.html>

Boaters in **Washington State** are subject to additional state laws regulating behavior near **Southern Resident Killer Whales**. See:

<http://wdfw.wa.gov/conservation/orca/>

When watching transient (Bigg's) killer whales, for the safety of the boaters it is wise to keep a close watch on not only the transient killer whales but also their prey (seals, sea lions, etc.). Transient killer whales can be elusive, erratic, stealthy, and/or aggressive towards their prey; their prey may seek refuge near boats, even boarding boats on rare occasion. Keep the boat out of the hunting arena, especially if the target is a sea lion — sea lions are much larger than they appear!

* **Motorized vessel, kayak, paddle board, etc.**

Southern Resident Killer Whales

For decades, Southern Resident killer whales have made an area in and around the San Juan Islands, extending about as far north as the Fraser River, their “core summer habitat” from April or May into the fall. The whales come in search of Chinook salmon returning to the Fraser River to spawn. However, the whales’ use of this area is changing, especially in recent years. The Center for Whale Research (CWR) is tracking and documenting these “fine scale” changes for

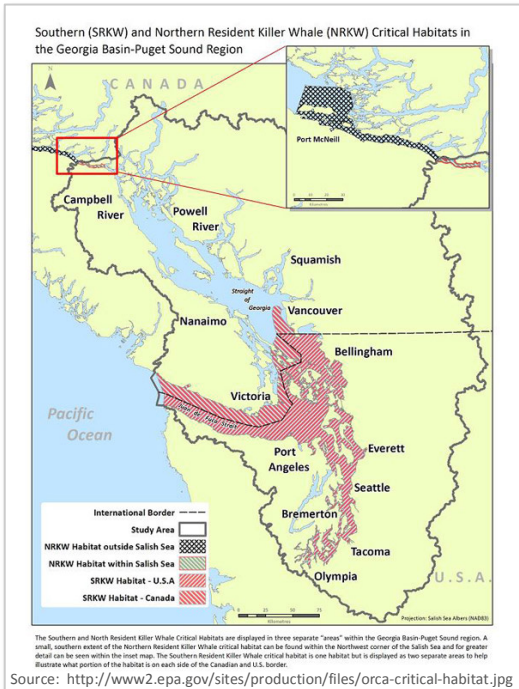


Figure 4. Critical Habitat for Southern Resident Killer Whales

2015 Southern Resident Killer Whale Sighting Summary (Central Salish Sea, Puget Sound, and Northern Strait of Georgia)

The graph below shows how many days Southern Resident killer whales were reported to be present in this region, with the number of whales present varying from 5 whales to more than 80 whales.

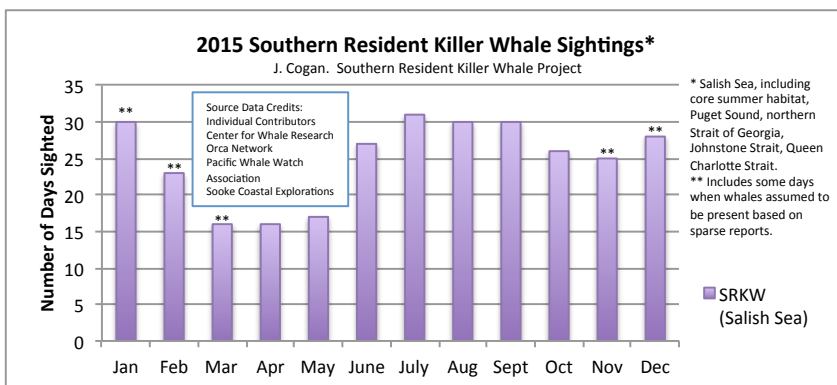


Figure 5. Southern Resident Killer Whale Sighting Reports for 2015 (Central Salish Sea, Puget Sound, and Northern Strait of Georgia)

Status

- US: **Endangered** (2005)
 - One of eight “**Species in the Spotlight**”. These eight species are considered by NOAA to have the highest risk of extinction in the near future (NOAA (May, 2015)).
- Canada: **Endangered** (SARA (2003)).

Critical Habitat (see map – Figure 4)

- US: Core summer habitat + Puget Sound + Strait of Juan de Fuca; and
- Canada: Core summer habitat (Strait of Juan de Fuca to Vancouver (Fraser River)).

Known Range

- Southern End: Monterey Bay, CA
- Northern End: Chatham Strait, SE Alaska
- Areas not currently part of Critical Habitat:
 - Outer coast of WA, OR, and CA;
 - Outer coast of Vancouver Island; and
- Northern Strait of Georgia, Johnstone Strait, and Queen Charlotte Strait.

Environmental Threats and Concerns

- Lack of Chinook salmon during all months of the year; Chum salmon availability in the fall;
- Man-made toxins that accumulate in their bodies (and those of their prey);
- Vessel disturbance (due to either proximity or noise), vessel strike;
- Risk of oil spills and other toxic exposure; and
- Military training within their range.

Population

- Researchers affiliated with the Center for Whale Research (CWR) have been tracking the Southern Resident Killer Whale population since 1976, documenting births and deaths, behaviors and associations, and habitat use.
- Critical research & recovery efforts also involve the Department of Fisheries and Oceans (DFO), NOAA, University of Washington Center for Conservation Biology, and Vancouver Aquarium.

Resources

- Killer Whales: The natural history and genealogy of Orcinus orca in British Columbia and Washington State*, John K. B. Ford, Graeme M. Ellis, and Kenneth C. Balcomb, 1994
- Center for Whale Research** web site: <http://www.whaleresearch.com>
- NOAA**: <http://www.nmfs.noaa.gov/pr/species/mammals/whales/killer-whale.html>
- Identification (ID) guide: The CWR produces ID guides for personal use (other uses of the population data require prior approval).

West Coast Transient (Bigg's) Killer Whales

It is becoming more and more common to see transient (Bigg's) killer whales in the central Salish Sea and Puget Sound, as evident in the graph below. These whales tend to travel in small groups, but occasionally travel in larger groups of more than a dozen whales. Transient killer whales are indeed “transient”. They may be seen on one day, then move on to a different area altogether, or they may be seen several times before leaving an area. Some are rare visitors to this area; others come and go many times throughout the year.

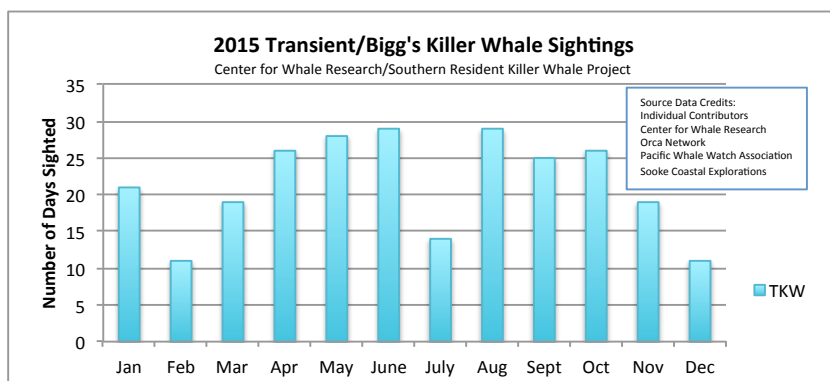


Figure 6. Transient (Bigg's) Killer Whale Sighting Reports for 2015 (Central Salish Sea and Puget Sound)

2015 Transient (Bigg's) Killer Whale Sighting Summary (Central Salish Sea and Puget Sound)

- Transient (Bigg's) killer whales were reported in every month.
- Transient (Bigg's) killer whales were reported virtually every day during some months of the year.
- On about half the days when one group of transients was sighted in one location, there was at least one other group of transients somewhere else in the area.
- Over the course of 2015:
 - Approximately 60 different family groups have been reported (in this context, “family group” can also refer to a single whale, typically a single “dispersed” male such as T49C, T77A, U39, etc.).
 - More than 165 individual whales have been reported.
- As in past years, there were occasional sightings of U39 and some of the CA transients.
- Rarely seen in the San Juan Islands and never before documented by CWR staff members, the T125s (T125, T125A, T127, and T128) made several appearances in 2015.
- In 2014 and 2015, the T065As were reported more often than any other group (more than 40 days each of these two years).
- One day in June, transients were spotted in 6-8 different locations (depending on when in the day the locations are counted), with more than 35 individual killer whales reported (members of T036s, T046Cs, T065s, T069s, T075s, T077s, and T125s; T049C) plus others not identified or identities not reported.

Status

- US: Not listed. **Protected** under the **Marine Mammal Protection Act**.

NOTE: AT1 transients listed as depleted.

- Canada: **Threatened** (SARA (2002)).

Range (West Coast Transients)

- Widely distributed throughout the Salish Sea, ranging from coastal Oregon to Alaska (some seen as far south as northern California).

Environmental Threats and Concerns

- Subject to many of the same environmental factors as the endangered Southern Residents, especially as they spend more time in urban areas:
 - Man-made toxins that accumulate in their bodies (and those of their prey);
 - Vessel disturbance (due to either proximity or noise); vessel strike;
 - Risk of oil spills and other toxic exposure;
 - Decreased prey availability; and
 - Military training within their range.

Population (West Coast Transients)

- Researchers affiliated with the Canadian DFO (based in Nanaimo, BC) have been monitoring this transient population for decades, documenting births, losses, and long-term and short-term associations. They have compiled an extensive sighting data base that includes sighting reports and photos from the public (see **Citizen Science and the DFO** on page 5).

Resources

- *Killer Whales: The natural history and genealogy of Orcinus orca in British Columbia and Washington State*, John K. B. Ford, Graeme M. Ellis, and Kenneth C. Balcomb, 1994
- *Transients: Mammal-hunting killer whales of British Columbia, Washington, and Southeastern Alaska*, John K. B. Ford and Graeme M. Ellis, 1999
- *Marine Mammals of British Columbia*, John K. B. Ford, 2014
- *Into Great Silence: A Memoir of Discovery and Loss among Vanishing Orcas*, Eva Saulitis, 2013 [Story of the AT1 transients]
- ID guide (Towers, *et al.*, Reference 1): The Canadian DFO makes a transient ID guide available for personal use (all other uses of information in the guide require prior approval).
- As a benefit of membership, the CWR offers an online ID catalog with color ID photos and additional information for the transients seen locally. A printed “pocket ID guide” is in work.

Northern Resident Killer Whales

Members of the Northern Resident killer whale community rarely visit the central Salish Sea. According to Jared Towers, DFO (Canada), members of the A clan have been sighted in this area a few times. Mark Malleson, on contract with DFO and based in Victoria, has documented the presence of G clan members on three occasions, 1999, 2013, and more recently, in 2015.

2015 Northern Resident Killer Whale Sighting Summary (Central Salish Sea and Puget Sound)

In November of 2015, members of the Northern Resident G clan were photographed in the Strait of Juan de Fuca. Mark Malleson and Jared Towers (DFO) identified the most recent visitors as members of the G17, G46, G27, G02, and G08 matriline.

A95 and a Potential Vessel Strike

Killer whales are not immune from vessel strikes. Although such incidents are believed to be rare, on August 22, 2015, a six-year old Northern Resident killer whale known to researchers as A95 was found with fresh wounds that were consistent with a propeller strike.

Researchers were in the area to photograph Northern Resident and transient (Bigg's) killer whales using an Unmanned Aerial Vehicle (UAV, or drone), and were able to photograph the wounds from different angles using both the drone and conventional photography. Over the next few days, the researchers were able to monitor the whale's condition.

NOTE: The researchers were operating with both the prerequisite marine mammal research license and flight authorization from Transport Canada.

A95 has been seen more recently on Nov. 9 (Marine Education and Research Society) and Nov.14 (Jared Towers, DFO). Photos show the wound is healing nicely.

For more information:

<http://www.cbc.ca/news/canada/british-columbia/young-killer-whale-may-have-been-injured-by-boat-propeller-1.3203832>

Citizen Science and the Department of Fisheries and Oceans (Canada)

For **resident, transient, and other killer whales** seen in British Columbia waters, the **DFO's Pacific Biological Station in Nanaimo** is home to the largest and longest running data set in the world. The historical data reflect not only the body of science contributed by researchers licensed to study these species, but also data from first-hand reports and photos contributed by the public.

For more information, see:

<http://www.bckillerwhales.com/citizen-science.html>

Southern Residents and their Close Encounter with Northern Residents

In late October, 2015, members of the Southern Resident K and L pods headed into the northern Strait of Georgia, and from there, through Johnstone Strait into the Queen Charlotte Strait. On the return trip, these Southern Resident killer whales were seen in Blackfish Sound, passing within about a mile of members of the Northern Resident killer whale community.

For more information:

BC Killer Whale Research Project: <https://www.facebook.com/bckillerwhales>

OrcaLab: <http://www.orca-live.net/community/> (see the post for October 21, 2015)

Status

- US: Not listed (infrequent visitors to US waters). **Protected under the Marine Mammal Protection Act.**
- Canada: **Threatened** (SARA (2003)).

Critical Habitat (see Figure 4)

- Canada: Eastern end of Queen Charlotte Strait to eastern end of Johnstone Strait.

Known Range

- Southern End: Grays Harbor, WA.
- Northern End: Glacier Bay, AK.

Environmental Threats and Concerns

- Lack of Chinook salmon during all months of the year; Chum salmon availability a factor in the fall;
- Man-made toxins that accumulate in their bodies (and those of their prey);
- Vessel disturbance (from either proximity or noise), vessel strike; and
- Risk of oil spills and other toxic exposure.

Population

- Researchers affiliated with the Canadian DFO (based in Nanaimo, BC) have been tracking the Northern Resident population for decades.
- Researchers at Orca Lab (Johnstone Strait) also monitor the Northern Resident population.

Resources

- *Killer Whales: The natural history and genealogy of *Orcinus orca* in British Columbia and Washington State*, John K. B. Ford, Graeme M. Ellis, and Kenneth C. Balcomb, 1994
- *Marine Mammals of British Columbia*, John K. B. Ford, 2014
- ID guide (Towers, *et al.*, Reference 2): The Canadian DFO makes a Northern Resident ID guide available for personal use (all other uses of the data and material in the guide require prior approval).

Borrowing a quote from Jackie Hildering, Marine Detective and Marine Education and Research Society, “*thank goodness for second chances*”. Whaling in the 19th and 20th centuries extirpated humpbacks from the Salish Sea. After being absent for nearly a century, humpbacks began to return to the Salish Sea in the 1990’s. One of the first was “Big Mama” (BCY0324, CRC-15122). Mark Malleson, who has been monitoring the return of humpbacks, reports that “Big Mama” has come back with five calves since 2003. Other humpbacks have also been seen with calves, including “Heather” (BCY0160, CRC-13712) who has brought four calves to the area. According to John Calambokidis, Cascadia Research Collective, these whales are part of the Washington/S British Columbia feeding group that generally uses offshore waters with some of them recently beginning to use the Salish Sea.

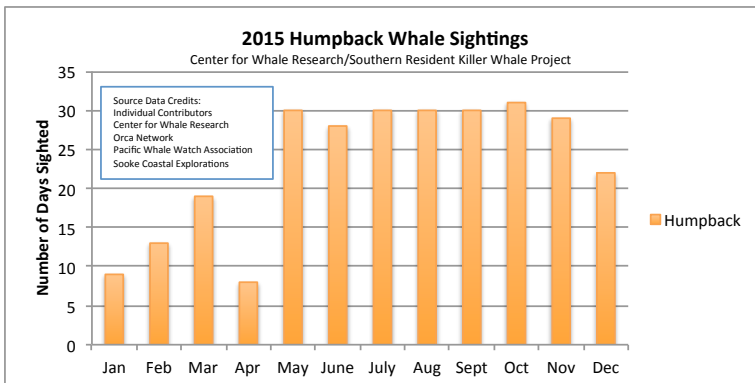


Figure 7. Humpback Whale Sighting Reports for 2015 (Central Salish Sea and Puget Sound)

2015 Humpback Whale Sighting Summary (Central Salish Sea and Puget Sound)

- In 2015, humpback sightings were reported in every month.
- Humpback sightings were reported nearly every day from May through November of 2015.
- On many days, there were sightings in multiple locations (e.g., Puget Sound, Strait of Juan de Fuca, Haro Strait, Rosario Strait, San Juan Channel, lower Strait of Georgia).
- Although it is difficult to accurately determine how many humpbacks were seen on any given day, it is possible that on some days there were as many as 15-25 whales present.
- One of the most unusual humpbacks reported was BCZ0131 (CRC-14003), nicknamed “Gnarly” because of the unique tail fluke. This whale was documented in January in the Strait of Juan de Fuca, then again in October.

From the Cascadia Research Collective Sighting Archives

- “Big Mama” (BCY0324, CRC-15122) was seen near the Hawaiian Islands in January of 2006 as part of the SPLASH study.
- “Gnarly” (BCZ0131, CRC-14003) has been seen in breeding areas off mainland Mexico in four different years going back to 1988.

Status

- US: **Endangered** (1970).
- Canada: **Threatened** (SARA (2005)).

Known Range (North Pacific Humpbacks)

- Summer: Coastal waters of north Pacific Ocean and inland waters of Salish Sea, from California to northwest Alaska.
- Winter: Hawaii, Mexico and Central America.
- NOTE: The humpbacks sighted in this area are part of the WA-S BC feeding area.

Environmental Threats and Concerns

- Prey reduction;
- Entanglement in fishing and crabbing gear;
- Vessel strike;
- Pollution, man-made toxins;
- Vessel disturbance (from either proximity or noise);
- Underwater noise disturbances, both acute and chronic (e.g., sonar, seismic exploration);
- Risk of oil spills and other toxic exposure; and
- Military training within their range.

Population (North Pacific Humpbacks)

- In British Columbia, the DFO monitors the humpback population, with field support from the Marine Education and Research Society.
- In the US, NOAA monitors the humpback populations with field support from the Cascadia Research Collective and the CWR. Cascadia has maintained a catalog of US West Coast humpbacks since 1986 (the basis for the US West Coast abundance estimates).

Resources

- *Marine Mammals of British Columbia*, John K. B. Ford, 2014
- **NOAA**: <http://www.fisheries.noaa.gov/pr/species/mammals/whales/humpback-whale.html>
- **Marine Education and Research Society** <http://www.mersociety.org/index.htm>
- **Cascadia Research Collective**
- Mark Malleson and the CWR have produced an ID guide for many of the humpbacks seen in the central Salish Sea and Puget Sound.
- The DFO has produced an ID guide for humpback whales associated with British Columbia. It is available for personal use, but any other use requires approval: <http://www.pac.dfo-mpo.gc.ca/science/species-especies/humpback-bosse/conditions-eng.htm>
- For humpback whales seen in Clayoquot Sound and Barclay Sound, there is yet another catalog (some of these humpbacks may be seen in the Salish Sea): <http://www.clayoquotwhales.ca/index.html>.

Other important ID catalogs include the Cascadia Research Collective catalog for US West Coast humpbacks and the SPLASH catalog.

Minke whales are thought to be seasonal visitors to the central Salish Sea. They are frequently seen in their preferred feeding areas from late spring through fall, but less is known about their range and distribution during other months of the year. In the winter, they may move to warmer waters where their calves are born. Some calves may follow their mothers to the Salish Sea, although it is likely that the calves are weaned or close to being weaned by the time they arrive.

In this area, minke whales tend to be solitary, with occasional reports of more than one being present in a single feeding area, or small groups swimming together for short periods of time.

Some of the same individual minke whales are seen from one year to the next. According to Jonathan Stern, Northeast Pacific Minke Whale Project, there are records of one particular individual being sighted in the Salish Sea over a period spanning 22 years. A few of these minke whales have also been sighted in British Columbia waters to the north.

Minke whales are challenging to spot. The whales are relatively small and their blows are barely noticeable (though the odor of their breath has earned them the nickname, “stinky minke”). Minke whales can be elusive, spending little time at the surface and constantly changing directions. Sometimes minke whales are seen in the vicinity of bait balls topped with lots of bird activity.

2015 Minke Whale Sighting Summary (Central Salish Sea and Puget Sound)

In 2015, minke whale sightings in the central Salish Sea were reported from March through October, with peak sighting reports in July through September. Most of the sightings in the central Salish Sea originated from the eastern Strait of Juan de Fuca (WA).

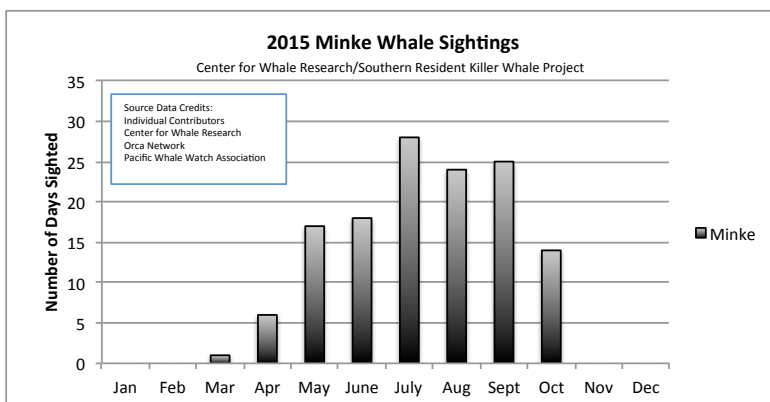


Figure 8. Minke Whale Sighting Reports for 2015
(Central Salish Sea and Puget Sound)

Status

- US: Not listed (neither endangered nor threatened in the Pacific Northwest). **Protected under the Marine Mammal Protection Act.**
- Canada: Not at Risk (COSEWIC).

Known Range

- The seasonal movements of minke whales in the eastern North Pacific are not well known. In the Salish Sea, some animals have seasonal home ranges. However, a few animals photographed in these waters in early spring or fall have been documented further north in British Columbia in summer, suggesting seasonal transit through the Salish Sea. Many have cookie cutter shark scars on their bodies implying annual seasonal movements into more temperate or tropical waters. (See Reference 3.)

Environmental Threats and Concerns

- Entanglement in fishing gear, including drift and gill nets, groundfish trawls, and herring weirs;
- Vessel strike;
- Vessel disturbance (from either proximity or noise);
- Underwater noise disturbances, both acute and chronic;
- Ecosystem degradation;
- Risk of oil spills and other toxic exposure.

Population

- In the US, NOAA periodically assesses the minke whale populations. The Northeast Pacific Minke Whale Project provides field support.
- In Canada, the Marine Education and Research Society monitors the minke whale populations, with field support from DFO.

Resources

- *Minke Whales*, A.R. Hoelzel and S. J. Stern, 2000
- *Marine Mammals of British Columbia*, John K. B. Ford, 2014
- **Marine Education and Research Society**
<http://www.mersociety.org/index.htm>
- **Northeast Pacific Minke Whale Project**
<http://www.northeastpacificminke.org>
- **NOAA:**
<http://www.nmfs.noaa.gov/pr/species/mammals/cetaceans/minkewhale.htm>

Identification

Minke whales can be uniquely identified by dorsal fin size and shape, and by the presence of nicks, scars, and other unique markings. Researchers in the US and Canada maintain catalogs of the whales. This is an important step in understanding their habitat use and seasonal movement.

Eastern North Pacific Gray Whales

The gray whales seen in the Salish Sea are part of the eastern North Pacific gray whale population. During the 19th century, whaling reduced this population to several thousand whales. An international ban on commercial whaling was adopted in the 1930s, allowing the population to begin to recover. This whale population was listed as endangered under the US Endangered Species Act in 1970, but “delisted” in 1994 based on evidence that the population had recovered. However, from 1998-2002, the population suffered a serious setback or unusual mortality event when, according to abundance estimates, the population declined from nearly 30,000 whales in 1997/1998 to about 18,000 whales in 2001/2002 (Reference 4). Based on these abundance estimates, more than 1/3 of the population was lost, possibly related to a food shortage or limited access to food in Alaska. Since then, this population has rebounded. However, in Canada, the eastern North Pacific gray whale population remains a species of “Special Concern”.

Each year, gray whales migrate along the Pacific coast from their winter calving areas in Baja California and Mexico to the summer feeding areas in Canada, Alaska, and Russia. There is a small population of about 200 whales that feed from spring through fall in coastal waters from northern CA to SE Alaska (the Pacific Coast Feeding Group). On their way north, a few gray whales, including a core group of about 10-12 whales, take a little detour into Puget Sound to forage there for a few months (February until May or June). The “north Puget Sound regulars” are not part of the Pacific Coast Feeding Group.

2015 Gray Whale Sighting Summary (Central Salish Sea and Puget Sound)

During the months of March-May of 2015, there were sightings of gray whales in Puget Sound, including at least nine of the “regulars”. One some days, their feeding pits were visible along the shoreline. In May, these visitors left Puget Sound to resume their northerly migration. Sightings in other parts of the central Salish Sea and at other times of the year were sparse.

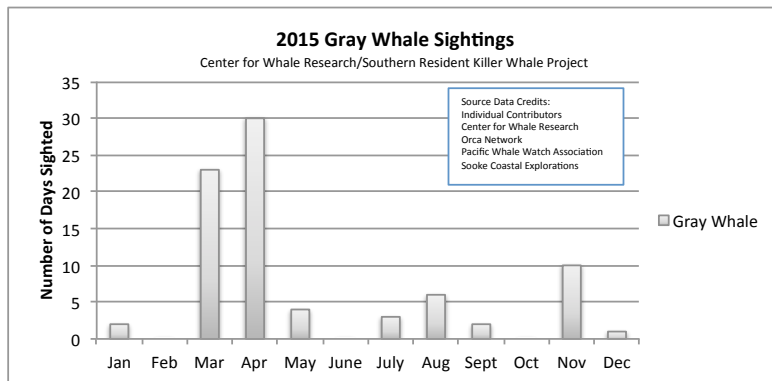


Figure 9. Gray Whale Sighting Reports for 2015
(Central Salish Sea and Puget Sound)

Status

- US: Eastern North Pacific Population has been “delisted” (1994). **Protected under the Marine Mammal Protection Act.**
- Canada: Eastern North Pacific population is a species of “Special Concern” (COSEWIC (2004)).

Known Range (Eastern North Pacific Population)

- Northern End (summer): northern Bering Sea, Beaufort Sea, and Chukchi Sea.
- Southern End (winter): Baja California, Mexico.

Environmental Threats and Concerns

- Food supply;
- Human activities and development in their breeding lagoons in Mexico;
- Entanglement in fishing gear, especially crabbing gear;
- Vessel strike;
- Vessel disturbance (from either proximity or noise);
- Habitat degradation and underwater noise disturbances (e.g., commercial and industrial development including oil and gas exploration, seismic testing, and wind farm construction) along migratory routes and in calving and feeding grounds;
- Subsistence whaling in the US (if resumed at unsustainable rates); and
- Risk of oil spills and other toxic exposure.

Population (Eastern North Pacific Population)

- In the US, NOAA monitors the gray whale population with field support from Cascadia Research Collective.
- In Canada, several researchers monitor the gray whale population and migration.
- NOTE: The Pacific Coast Feeding Group includes gray whales that feed in coastal waters from northern CA to SE Alaska, recently identified as genetically distinct from the main population. The “north Puget Sound regulars” are not part of this group.*

Resources

- *Marine Mammals of British Columbia*, John K. B. Ford, 2014
- **Cascadia Research Collective**
<http://www.cascadiaresearch.org/graywhale.htm>
- **NOAA**: <http://www.fisheries.noaa.gov/pr/species/mammals/whales/gray-whale.html>
- **DFO**: http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=356#ot18
- Identification: Gray whales can be identified by unique markings on their backs and tail flukes. Researchers in US and Canada maintain catalogs of gray whales. Cascadia Research Collective offers an ID guide for Puget Sound gray whales:
<http://www.cascadiaresearch.org/gray/PS%20Er%20Field%20Guide.pdf>

* From John Calambokidis, via personal communication.

Fin whales are the second-largest species of whale, up to 75 feet long in the northern hemisphere.

Live fin whales are rarely sighted in inland waters known as the Salish Sea. According to Jared Towers, DFO (Canada), since 1930 there have been sightings of eight live fin whales in this area. After the 1930 sighting, the next confirmed sighting in the Salish Sea was recorded in 2005. Mark Malleson documented fin whale sightings in the Strait of Juan de Fuca in both 2005 and 2006. Among the remaining sightings is a 2012 sighting in Dodd Narrows. That fin whale was seen a few days later off Campbell River and again near Alert Bay (Johnstone Strait, Canada). September of 2015 brought reports of fin whale sightings in the eastern Strait of Juan de Fuca.

2015 Fin Whale Sighting Summary (Central Salish Sea and Puget Sound)

In September, there were reports of a whale resembling a “minke on steroids”, with a towering blow that could be seen and heard from a long distance away. The whale was quickly identified as a fin whale. The lone fin whale was first reported on September 2, and was reported again on multiple days in September and October. There was one report in early November (Center for Whale Research), and one report in late December (Mark Malleson). This represents the eighth live fin whale seen in the Salish Sea since 1930.

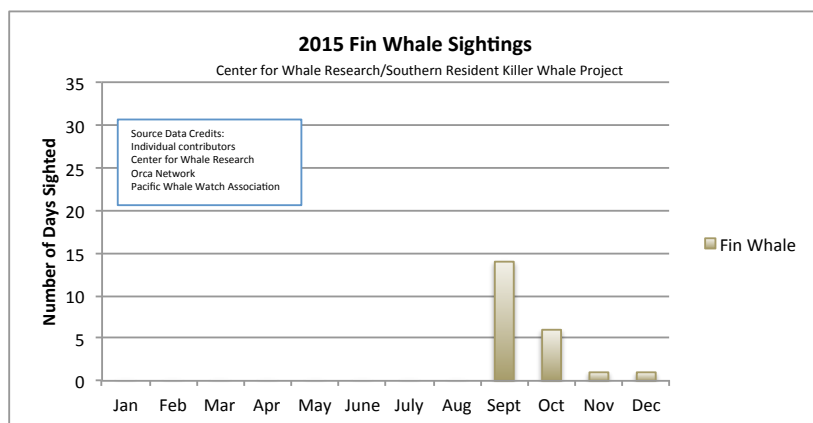


Figure 10. Fin Whale Sighting Reports for 2015
(Central Salish Sea and Puget Sound)

Status

- US: **Endangered** (1970).
- Canada: Pacific population is **Threatened** (SARA (2006)).

Known Range (North or Northeast Pacific Population and CA/OR/WA Stock)

- Southern CA to Chukchi Sea for the two populations specified.

Environmental Threats and Concerns

- Vessel strike (among the large whales species, fin whales are most often reported as victims of ship strikes);
- Entanglement in fishing gear;
- Reduced prey abundance and/or changes in prey distribution;
- Vessel disturbance (from either proximity or noise);
- Other sources of habitat degradation including acute and chronic underwater noise (e.g., sonar, seismic exploration) as well as oil and gas activities in northern areas;
- Pollution;
- Risk of oil spills and other toxic exposure;
- Military training within their range; and
- Whaling (commercial whaling if allowed to resume and/or scientific whaling if it were allowed to target this species).

Population

- NOAA monitors several fin whale populations, including the Northeast Pacific stock and the CA/OR/WA stock.
- DFO monitors the fin whale populations(s) seen in Canadian waters.

Resources

- *Marine Mammals of British Columbia*, John K. B. Ford, 2014
- **NOAA:**
<http://www.fisheries.noaa.gov/pr/species/mammals/whales/fin-whale.html>
- **DFO:**
http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=875#ot18

Identification

Individual fin whales can be identified by dorsal fin size and shape, nicks, scars, and coloration. Researchers in the US and Canada maintain catalogs of fin whales.

Full Citations and References

1) Transient Killer Whale Identification Guide (cited with permission)

Towers, J. R., Ellis, G. M., and Ford, J. K. B. 2012. Photo-identification catalogue of Bigg's (transient) killer whales from coastal waters of British Columbia, northern Washington, and southeastern Alaska. Can. Data Rep. Fish. Aquat. Sci. 1241: v + 127 p.

Link available here: <http://www.bckillerwhales.com/publications.html>

2) Northern Resident Killer Whale Identification Guide (cited with permission)

Towers, J. R., Ellis, G. M. and Ford, J. K. B. 2015. Photo-identification catalogue and status of the northern resident killer whale population in 2014. Can. Tech. Rep. Fish. Aquat. Sci. 3139: iv + 75 p.

Link available here: <http://www.bckillerwhales.com/publications.html>

3) Towers, J. R., McMillan, C. J., Malleeson, M., Hilderling, J., Ford, J. K. B., Ellis, G. M., Seasonal movements and ecological markers as evidence for migration of common minke whales photo-identified in the eastern North Pacific, J. Cetacean Res. Manage., 13(3): 221-119, 2013.

4) Angliss, R. P., and R. B. Outlaw. 2005. Alaska marine mammal stock assessments, 2005. U.S. Dep. Commer., NOAA Tech. Memo. NMFS AFSC-161, 250 p.

Additional Resources and Recent Research Publications

Allen, B. M. and R. P. Angliss. 2015. Alaska Marine Mammal Stock Assessments, 2014. U.S. Department of Commerce, NOAA Technical Memorandum, NMFS-AFSC-301. 313 p.

Carretta, J. V., E. M. Oleson, D. W. Weller, A. R. Lang, K. A. Forney, J. Baker, M. M. Muto, B. Hanson, A. J. Orr, H. Huber, M. S. Lowry, J. Barlow, J. E. Moore, D. Lynch, L. Carswell, and R. L. Brownell Jr. 2015. U.S. Pacific Marine Mammal Stock Assessments: 2014. U.S. Department of Commerce, NOAA Technical Memorandum, NOAA-TM-NMFS-SWFSC-549. 414 p.

Fisheries and Oceans Canada. 2013. Recovery Strategy for the North Pacific Humpback Whale (*Megaptera novaeangliae*) in Canada. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa. x + 67 pp.

Ford, M. J., Hempelmann J., Hanson, M. B., Ayres, K. L., Baird, R. W., Emmons, C. K., *et al.* (2016) Estimation of a Killer Whale (*Orcinus orca*) Population's Diet Using Sequencing Analysis of DNA from Feces. PLoS ONE 11(1): e0144956. doi:10.1371/journal.pone.0144956

Gregg, E. J., J. Calambokidis, L. Convey, J. K. B. Ford, R. I. Perry, L. Spaven, M. Zacharias. 2006. Recovery Strategy for Blue, Fin, and Sei Whales (*Balaenoptera musculus*, *B. physalus*, and *B. borealis*) in Pacific Canadian Waters. In Species at Risk Act Recovery Strategy Series. Vancouver: Fisheries and Oceans Canada. vii + 53 pp.

Houghton, J., Holt, M. M., Giles, D. A., Hanson, M. B., Emmons, C. K., Hogan, J. T., *et al.* (2015) The Relationship between Vessel Traffic and Noise Levels Received by Killer Whales (*Orcinus orca*). PLoS ONE 10(12): e0140119. doi:10.1371/journal.pone.0140119

Veirs, S., Veirs, V., Wood, J. D. (2016), Ship noise extends to frequencies used for echolocation by endangered killer whales. PeerJ 4:e1657; DOI 10.7717/peerj.1657

For a photographic tribute to the Salish Sea, its marine life, and the complexity of its ecosystem, see:

The Salish Sea: Jewel of the Pacific Northwest

A.D. Benedict and J. K. Gaydos

Seattle: Sasquatch Press (2015)

Acronyms

| | |
|---------|---|
| COSEWIC | Committee on the Status of Endangered Wildlife in Canada |
| CWR | Center for Whale Research |
| DFO | Department of Fisheries and Oceans |
| ID | Identification |
| NOAA | National Oceanic and Atmospheric Agency |
| NRKW | Northern Resident Killer Whale |
| SARA | Species at Risk Act |
| SPLASH | Structure of Populations, Levels of Abundance and Status of Humpbacks |
| SRKW | Southern Resident Killer Whale |
| TKW | Transient (Bigg's) Killer Whale |

Citation for the 2015 Whale Sighting Report (May be cited for research and education; Please no commercial use)

Cogan, J. 2015 Whale Sighting Report – Central Salish Sea and Puget Sound, Center for Whale Research, Friday Harbor, WA. 10 p.