Cetaceans: sightings on the rise

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What is happening?

In the previous report (see Cetaceans, Ocean Watch Howe Sound Edition [OWHS] 2017) data up to and including 2015 showed cetaceans (whales, dolphins and porpoises) were making a triumphant comeback to Átl'ka7tsem/Txwnéwu7ts/Howe Sound. This strong comeback persists today.

Harbour porpoise. (Credit: Ocean Wise)

What is the current status?

Since 2016, reports of cetaceans to the B.C. Cetacean Sightings Network (BCCSN) have continued to increase. In 2018, the BCCSN received 335 sighting reports from the Átl'ḵa7tsem/Txwnéwu7ts/Howe Sound area, submitted by 116 volunteer observers (Figure 1).

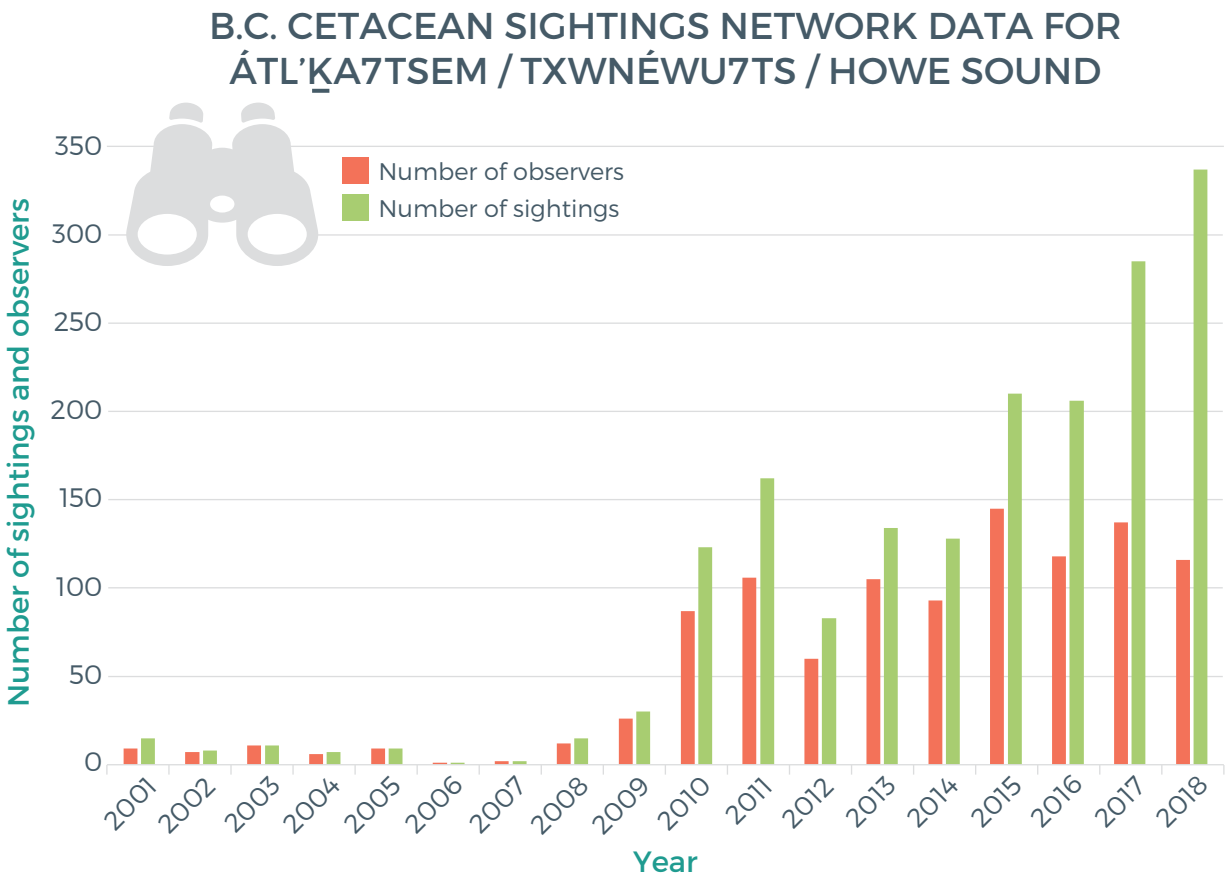

Figure 1. Total number of observers and number of cetacean sightings reported to the BCCSN in Átl'ḵa7tsem/Txwnéwu7ts/Howe Sound by year.

Killer whales (*Orcinus orca)* were the most commonly reported large cetacean in 2018, with 190 reports submitted to the BCCSN. Since 2015, there has been a 60% increase in killer whale sightings in the area, with considerably more sightings reported west of Chá7elkwnech/Gambier and Lhaxwm/Anvil Islands compared to 2015 (Figure 2).

Whenever possible, the BCCSN identifies individual killer whales using photos submitted with sighting reports. In 2018, the majority of sightings where individuals could be identified belonged to the marine mammal-eating Bigg's (transient) killer whale population. The increased presence of Bigg's killer whales could be an indication of a healthy harbour seal (*Phoca vitulina*) population in Átl'ka7tsem/Txwnéwu7ts/Howe Sound. Harbour seals are a major prey item for Bigg's killer whales, making up of over 50% of their diet. Bigg's killer whales will also target other small cetaceans and pinnipeds (i.e., seals, sea lions), and occasionally hunt smaller baleen whales such as minkes (*Balaenoptera acutorostrata*).[1]

By contrast, resident killer whales (both northern and southern resident populations) are salmon specialists. The majority of their diet is comprised of large, nutrient-dense Chinook (*Oncorhynchus tshawytscha*).[2] Fish-eating northern resident killer whales made only a single, brief foray into Átl'ka7tsem/Txwnéwu7ts/Howe Sound in 2018. Chinook salmon runs

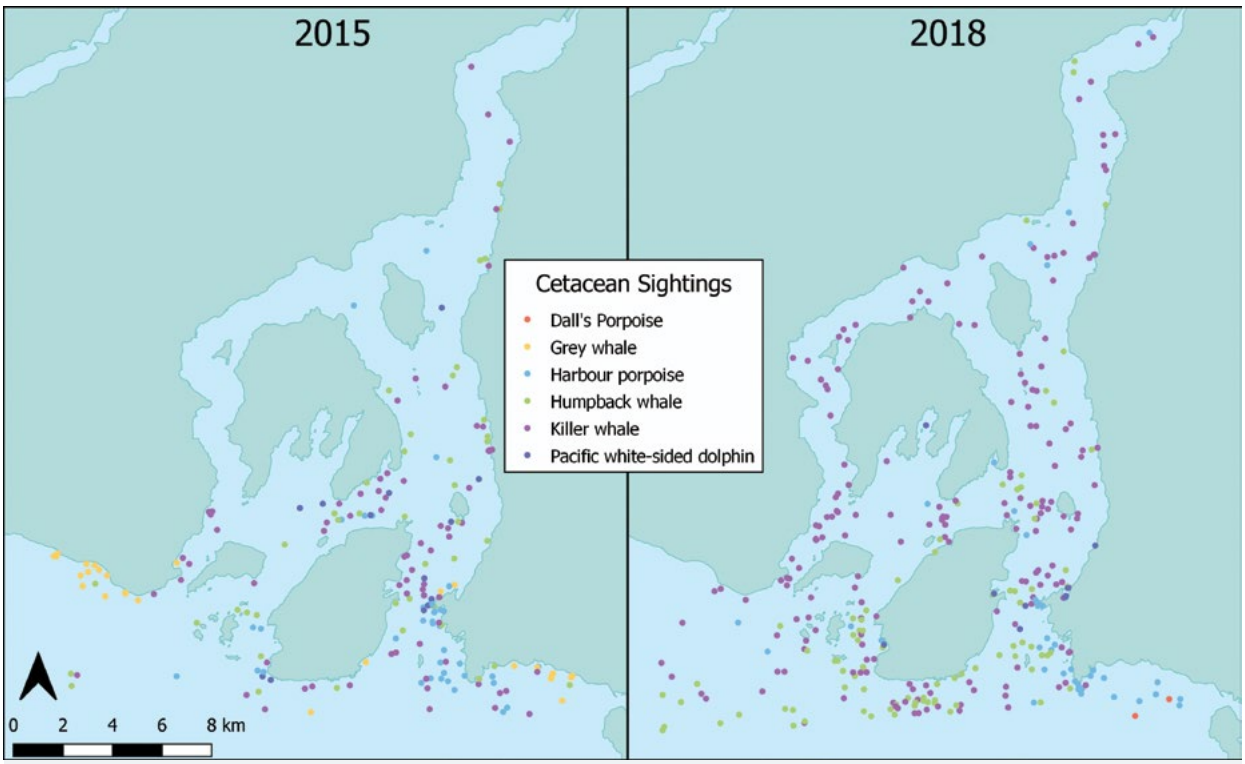

Figure 2. Cetacean sighting reports submitted to the BCCSN in 2015 (left panel) compared to 2018 (right panel), by species. One point on the map is equivalent to one cetacean sighting.

Humpback whale in Átl'ka7tsem/Txwnéwu7ts/Howe Sound. (Credit: Rhys Sharry)

in Átl'ka7tsem/Txwnéwu7ts/Howe Sound have been depleted since the 1970s and 1980s[3] and could explain the near absence of resident killer whales from Átl'ka7tsem/Txwnéwu7ts/Howe Sound waters.

Humpback whales (*Megaptera novaeangliae*) were the second most frequently reported large cetacean, with a total of 87 reports in 2018 (Figure 3). This number has more than doubled since 2015. Historically, the Strait of Georgia was the seasonal home for 100-150 humpbacks. However, this population was eradicated by intensive whaling activities in 1907. Since 1907, humpbacks had been virtually absent from Átl'ka7tsem/Txwnéwu7ts/Howe Sound until 2008 when they began reappearing in large numbers. Humpbacks are now recovering to near historical levels in Átl'ka7tsem/Txwnéwu7ts/Howe Sound. These sightings are likely a reflection of the overall increase in humpback abundance in the Strait of Georgia. In addition, habitat restoration efforts in Átl'ka7tsem/Txwnéwu7ts/Howe Sound have increased the abundance of forage fish such as herring (*Clupea pallasi*) and northern anchovy (*Engraulis mordax*), two major prey items for humpback whales.[4]

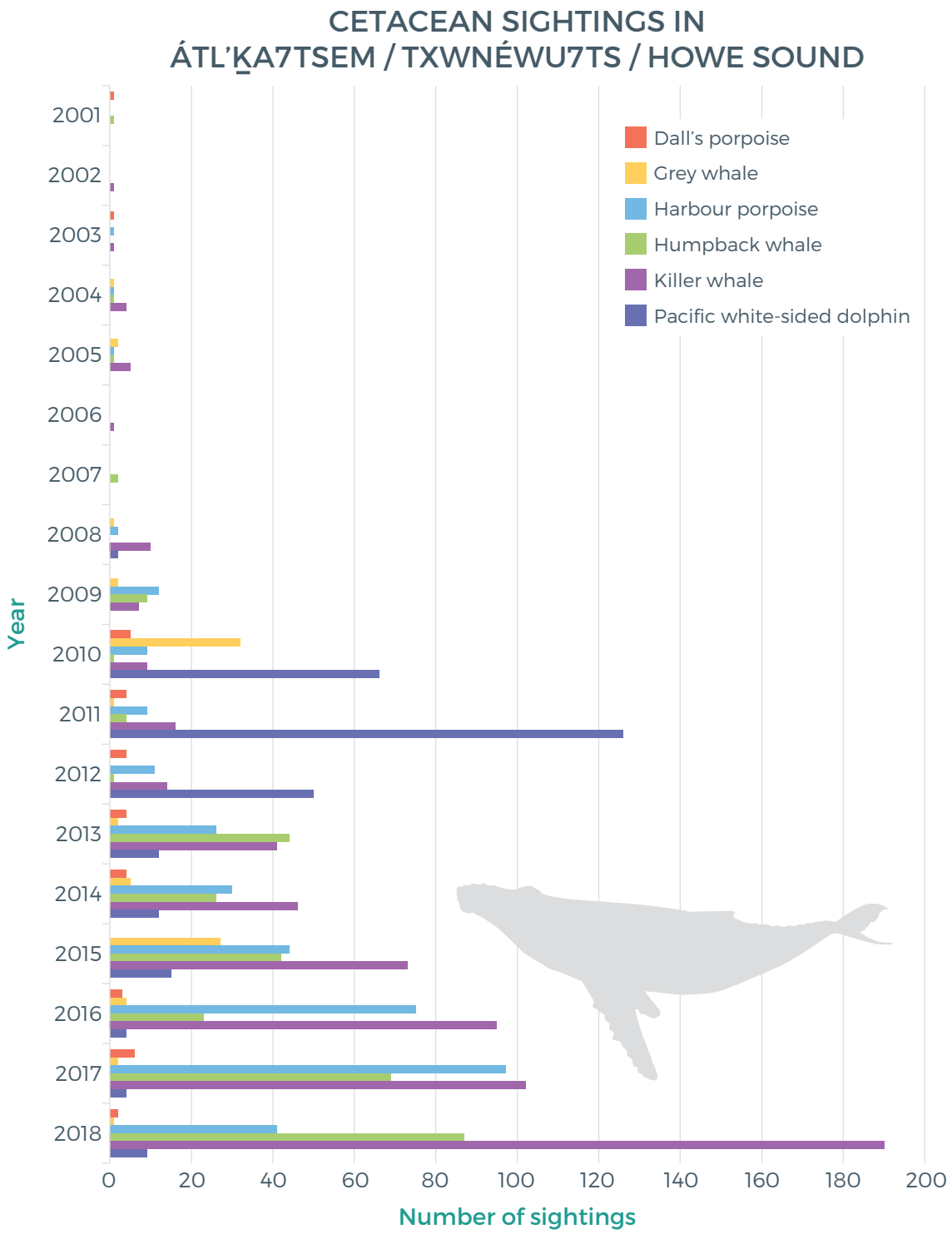

Figure 3. Cetacean sightings in Átl'ḵa7tsem/Txwnéwu7ts/Howe Sound from 2001–2018, by species.

Harbour porpoises (*Phocoena phocoena*) were the most commonly reported small cetacean (i.e., any dolphin/porpoise other than killer whales, typically under six feet in length) in 2018 (Figure 3). However, this number has decreased by 58% from the previous year. There was a surge in Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) sightings between 2010 and 2012, but this trend has not continued (Figure 3). One explanation for the decrease in small cetacean sightings may be the increased abundance of Bigg's killer whales, which are the primary predators of both harbour porpoise and Pacific white-sided dolphins.[1] Additionally, a change in the abundance or distribution of preferred prey for small cetaceans (e.g., forage fish such as Pacific sand lance, *Ammocytes haxapterus*) may be occurring.

Increased melting of the Pemberton icefields in recent years[5] will likely alter forage fish habitat and recruitment by affecting salinity, sedimentation and temperature.[6] Forage fish could also be losing access to critical spawning habitat due to increased shoreline development in Átl'ka7tsem/Txwnéwu7ts/Howe Sound, an issue potentially exacerbated by sea level rise, storm surges, and extreme weather due to climate change.

Residents of Átl'ka7tsem/Txwnéwu7ts/Howe Sound are enthusiastic participants in the BCCSN, and these contributions have created a unique dataset to inform cetacean trends in the area. However, one cannot rule out the possibility that the trends seen in Átl'ka7tsem/Txwnéwu7ts/Howe Sound are reflective of observer effort and not due to changes in species abundance and composition. The area with the highest density of sighting reports is from Sḵ'íẁitsut/Point Atkinson to Ch'axáy/Horseshoe Bay and the surrounding area (Figure 4), one of the areas of highest human population density in Átl'ka7tsem/Txwnéwu7ts/Howe Sound. Although the number of Átl'ka7tsem/Txwnéwu7ts/Howe Sound observers reporting to the BCCSN has remained steady since 2015, it is possible that these observers have improved their ability to detect cetaceans, or have established the habit of reporting more consistently, resulting in an increase in sighting reports. Smaller cetaceans may also be observed less frequently than larger cetaceans such as killer whales and humpbacks due to their small size or elusive nature.

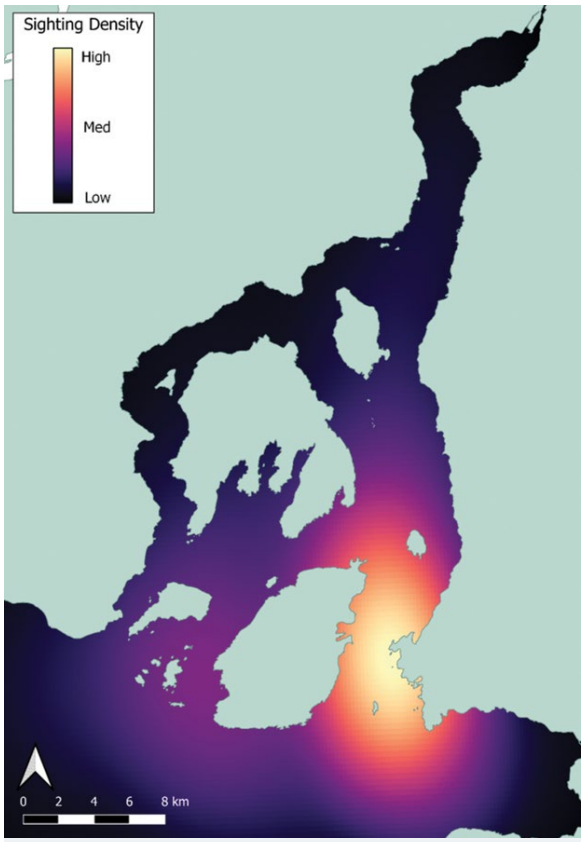

Figure 4. Density of cetacean sightings reported to the BCCSN from 2016 to 2019.

What are the potential impacts of climate change on cetaceans?

Climate-driven weather pattern variations have been linked to massive die-offs and shifts in distribution of plankton, fish and marine mammals.[7] Changes in weather systems and wind patterns off the B.C. coast can cause marked fluctuations in the production of phytoplankton that form the base of many aquatic food webs (see Plankton, OWHS 2017). This can affect the distribution and abundance of zooplankton and forage fish, causing significant changes in the distribution of humpbacks and other baleen whales.[4]

Warmer water temperatures resulting from climate change may disrupt the synchronization between phytoplankton production and zooplankton, the main grazers of phytoplankton, thus affecting growth and survival of animals higher up the food web. Changes due to timing mismatches in the food web are likely to have serious implications for marine mammals.[7] Warmer water may result in a northward shift in both the distribution of marine mammals and their prey.[4] A northward shift in prey distribution will mean longer migration paths for baleen whales that undertake long-distance migrations from their tropical breeding grounds to high-latitude feeding grounds, and therefore increased energy expenditure.[7]

Construction of hard shore armouring (e.g., sea walls, dikes) and other shoreline development in Átl'ka7tsem/Txwnéwu7ts/Howe Sound could reduce coastal refuges for forage fish and degrade spawning habitat by blocking the natural erosion of material that creates spawning substrate.[8] A reduction in forage fish abundance in Átl'ka7tsem/Txwnéwu7ts/Howe Sound would likely result in a decrease in the number of cetaceans and other marine mammals in the area.

What has been done since 2017?

The table below reports on progress made on recommended actions from the previous 2017 article, where identified. Many of these require ongoing action.

2017 ACTION	ACTION TAKEN
INDIVIDUAL AND ORGANIZATION ACTIONS	
Report cetacean sightings using the WhaleReport app, available for iOS and Android devices on the iTunes and Google Play stores.	In addition to contributing to conservation-based research, sighting reports alert mariners of large commercial vessels to the presence of cetaceans in the area so they can take measures to reduce the risk of collision or disturbance (i.e., slowing down or altering their course). As of August 2019, over 1,500 alerts have been generated using sighting reports submitted via WhaleReport.
GOVERNMENT ACTIONS AND POLICY	
Provide large-vessel captains with resources so they can safely transit waters when whales are in the area.	The WhaleReport Alert System now effectively does this.
Legislate against the production and use of single-use plastic.	Canada to ban single-use plastics and hold companies responsible for plastic waste as early as 2021.[9]
Legislate mandatory safe-distance for vessels from cetaceans.	New regulations (2019): • Boats must stay 400 m away from orcas or killer whales in Southern Resident Killer Whale critical habitat. • Boats must stay 200 m away from killer whales in other B.C. waters. • Boats must stay 100 m from all other cetaceans (e.g., humpback whales, harbor porpoises). • Boats must stay out of certain sections of Swiftsure Bank, off the east coast of Saturna Island and south-west of North Pender Island.Visit http://bewhalewise.org/ for more information on regulations.

What can you do?

A detailed overview of recommended actions relating to climate change is included in *The path to zero carbon municipalities* (OWHS 2020). In some cases, no progress was identified on previous recommended actions; these remain listed below.

Individual and Organization Actions:

- When viewing cetaceans from a boat, follow the Be Whale Wise Guidelines to avoid disturbing or displacing them.
- Purchase sustainable ocean wise seafood. In your business, ensure food sold or supplied is sustainable (if applicable).
- Purchase products that do not contain harmful toxins such as Persistent Organic Pollutants (POPs).
- Recycle and properly dispose of garbage to prevent marine debris that can be harmful if ingested, or cause entanglement. Ensure workplaces are equipped with proper disposal options.
- Minimize the use of plastics, especially single-use plastics.

Government Actions and Policy:

- Monitor pollutant levels, enforce and where necessary amend pollution regulations.
- Monitor and when warranted restrict fishing to protect the prey resources of cetaceans in Átl'ḵa7tsem/ Txwnéwu7ts/Howe Sound.
- Continue to update *Species at Risk Act* (SARA) reports on a regular basis to reflect current status of species.
- Continue to aid and support population studies of Species At Risk, or potential Species At Risk.
- Continue to support and facilitate growth of the Marine Mammal Response Network to ensure timely and safe incident responses coast-wide.
- Increase public education regarding species of cetaceans, the risks they face, and how the public can help. Continue to support children and youth educational programs.
- Support citizen science and grassroots initiatives related to cetacean conservation.
- Empower local communities by ensuring they are educated on the proper actions to take in the event of an oil spill. Provide the required resources for communities to safely respond and assist in the event of a spill.
- Facilitate the creation of ecosystem-based species management plans in order to help ensure a sustainable predator-prey balance.

Methods

Our understanding of cetacean abundance and distribution in Átl'ḵa7tsem/Txwnéwu7ts/Howe Sound and other parts of the province is largely based on sightings provided to the BCCSN by a volunteer network of coastal citizens and mariners. Data are collected by observers and reported in a standardized way via phone, email, mailed logbook entry, WhaleReport smartphone application or webform. Committed observers are recruited through educational presentations and training workshops on cetacean and sea turtle identification, natural history and conservation. The data collected are reviewed for accuracy and filtered to remove multiple sightings of the same animal(s) at the same time and location. The BCCSN database, which now contains over 116,000 sightings, enables the protection of essential habitat, highlights areas of high risk to these vulnerable species and allows for targeted outreach and mitigation.

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