

2019 SOUNDWATCH PROGRAM ANNUAL CONTRACT REPORT

Project Title: Soundwatch Public Outreach/Boater Education Project.

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Contract Number: **1305M138DNFFP0011** **Tasks C.2.2.2a & C.6.2**

Contract Date: Extension year of multi-year contract: August 30, 2019 - August 31, 2023



Abstract:

The goal of this project was to provide on-the-water stewardship, public outreach and boater education services by The Whale Museum's Soundwatch Boater Education Program during the 2019 killer whale watching season and to provide a data update to the **RA-133F-12-CQ-0057** and **1305M138DNFFP0011**. Soundwatch Public Outreach/Boater Education Project Final Project Report characterizing general trends in vessel-based whale watching activities associated with Southern Resident Killer Whales in the Haro Strait Region of Washington State and Southern Vancouver Island, British Columbia, Canada.

Executive Summary:

The goal of the Soundwatch Program is to reduce vessel disturbance to killer whales and other marine wildlife through educating recreational boaters on regional guidelines and regulations, to provide systematic monitoring of vessel activities around all cetaceans within the program area, and to present a data update to the 2018 report on whale watching trends in the Haro Strait region to inform future management strategies. The program area includes the north central Salish Sea: the boundary waters of the Canadian Gulf and San Juan Islands, located in northwestern Washington State and southwestern British Columbia in the Puget Sound/Georgia Basin. The Salish Sea includes Puget Sound and the Straits of Georgia and Juan de Fuca.

The objectives of this 2019 project were to: provide boater education services through public outreach and on-the-water stewardship activities, to monitor vessel activity within 0.5 mile radius of whales, specifically killer whales (*Orcinus orcas*) with a priority to Southern Resident killer whales (SRKWs) from May-September, collect data on vessel activities, and conduct analysis on vessel activities in the Central Salish Sea around killer whales and other marine wildlife.

SRKWs have been closely monitored for several decades. Their population peaked at 97 whales in the 1990s and then declined to 79 whales in 2001. NMFS listed the Southern Resident killer whale distinct population segment (DPS) as endangered under the ESA on November 18, 2005 (70 FR 69903). As of December 2019, there were 73 Southern Resident killer whales (Center for Whale Research).

In May 2011, the National Oceanic Atmospheric Administration (NOAA) Fisheries implemented new vessel regulations around all killer whales in the inland waters of Washington State. The regulation included two prohibitions: a prohibition on approaching killer whales within 200 yards and a prohibition on positioning a vessel within 400 yards of the path of killer whales. In addition, Washington State updated the Revised Code of Washington (RCW 77.15.740) on SRKWs in 2012 to match the Federal 200 yard and 400 yard in-the-path approach distances for inland waters. In July 2018, Canada passed vessel regulations for killer whale populations in British Columbia and the Pacific Ocean. The new Canadian regulations stated all vessels should operate 200 meters away from all killer whales.

Vessel regulations were again updated at the beginning of the 2019 season with Washington State revising regulations (RCW 77.15.740) to increase vessel approach distances to 300 yards

and requiring vessel to maintain less than 7 knots within a half mile of SRKW in Washington State waters. This update was put forward in response to a recommendation by the Orca Recovery Task Force to suspend commercial whale watching on SRKW, which was established by Governor Jay Inslee in March 2018. The new state bill was signed May 8th becoming effective July 28, 2019. Similarly, Canada increased vessel approach distances from 200 meters to 400 meters of all killer whales through a Transport Canada interim order effective June 15 – October 15, 2019. Included in the interim order was an agreement signed by most commercial whale watching companies allowing those companies to approach Transient Killer Whales to 200 meters if they did not approach Southern Resident Killer Whales or advertise trips for viewing SRKW to their customers. These actions played a direct role in the education and research efforts of Soundwatch and will be referenced throughout this report.

The 2019 Soundwatch data collection consisted of: counts of vessels within one half-mile of any cetacean by type, location and activity (“vessel counts”), cetacean behavior data: identification, number of animals/groups, location, travel direction and behavior states, vessel contact information (“recreational contacts”) as well as EcoTour (commercial) and private recreational vessel compliance with voluntary guidelines and/or regulations (“vessel incidents”). A brief summary of whale presence in the Central Salish Sea is given in this report. The entirety of Soundwatch data on cetacean identification, number of animals/groups, location, travel direction and selected behaviors is incorporated into The Whale Museum’s long-term Whale Sightings’ database. Soundwatch data specific to SRKWs is compiled into the Museum’s annual Orca Master NOAA Contract Report. All Soundwatch data is available through The Whale Museum’s datasets or upon request.

Data analyzed for this annual update report reflects data collected by The Whale Museum's Soundwatch Boater Education Program in 2019 and includes vessel incidents, behaviors that are inconsistent with current guideline and regulations, definitions related to the Be Whale Wise guidelines and the U.S. Federal, Washington State and Canadian vessel regulations. This update report depicts general trends in vessel-based whale watching activities associated with SRKWs in the Haro Strait region of Washington State and British Columbia, Canada.

This updated report on the disposition of funds from Contract Number RA-133F-12-CQ-0057 & Amendment 1305M138DNFFP0011, Tasks C.2.2.2a & C.6.2, entitled Soundwatch Public Outreach/Boater Education Project, fulfills reporting requirements under the NOAA Administrative Terms and Conditions of the contract.

Note: Included as an additional appendix to this report are copies of the Soundwatch Program 2019 data sets in MS Excel.

Project Goal:

The goal of the Soundwatch Public Outreach/Boater Education Project was to implement The Whale Museum’s Soundwatch Boater Education Program during the 2019 whale watching season and provide data analysis updates to the 2018 report on whale watching trends in the Haro Strait region.

Project Objectives:

The objectives of this project were to:

- 1) Provide boater education services through public outreach and on-the-water stewardship activities during the 2019 whale watch season
- 2) Collect data on vessel activities during the 2019 whale watch season, especially relative to the 2011 U.S. Federal, 2019 Washington State vessel regulations and 2019 Transport Canada Interim Order
- 3) Conduct analysis on current whale watch activities including continued evaluation of 2011 U.S. Federal vessel regulations
- 4) Provide 2019 data updates to the 2018 Soundwatch Public Outreach/Boater Education Project Report

Project Results:

The contract listed several deliverables including:

1305M138DNFFP0011

C.2.2.2a The vendor shall provide a written report summarizing the Soundwatch program activities, patterns of vessel activities around the whales, and compliance with guidelines and regulations. Data will be compiled into an annual data set following standardized protocols to allow for comparison between years which include the following information:

- 11) Total Vessel Incidents by percentage
- 12) Annual Vessel Incident Summary by incident and vessel type
- 13) Top 5 Vessel Incidents by vessel type
- 14) Geographic distribution of Vessel Incidents

C.6.2 Deliverables: For each task or subtask deliverables shall be provided in the form of reports and data to the NWFSC by 15 February for draft reports and data and final reports and data will be due 1 March of each year of the contract for data collected in the previous year.

RA-133F-12-CQ-0057

Task 6.2A: Conduct estimated 50 days on-the-water education and monitoring activities during the months of May through September 2019.

C.6.2A.1 Deliverables for Soundwatch Education and Monitoring Program. Sub-Task 6.2.1.1: Summary of Soundwatch Activities, Patterns of Vessel Activities Around Whales, and Compliance with Regulations and Guidelines.

- 1) Whale Watching Trends in the Boundary Waters of Haro Strait May-September in numbers of visitors to Lime Kiln Point and number of active vessels from U.S. and Canada.

- 2) Growth of Commercial (EcoTour) Whale Watching in the Boundary Waters of Haro Strait May-September in number of vessels.
- 3) Commercial (EcoTour) Whale Watch Platforms in the Boundary Waters of Haro Strait May-September in numbers of vessels.
- 4) Average Number of Vessels with killer whales Per Month May-September in numbers of vessels.
- 5) Annual Average Numbers of Vessels with killer whales at Different Times of Day, May-September in number of vessels.
- 6) Annual Vessel Type Averages and Maximum Vessel Type Numbers of Vessels.
- 7) Mean Annual Daily Average of Number of EcoTour (Commercial) and Private recreational boats with Whales in Haro Strait Region May-September with Standard Deviation in number of vessels.
- 8) Annual Distribution of Vessels within ½ Mile Radius of Whales May-September in percentages.
- 9) Distribution of EcoTour (Commercial) Whale Watch within ½ Mile Radius of Whales in percentages.
- 10) Distribution of Private recreational vessels within ½ Mile Radius of Whales in percentages.
- 11) Total Vessel Incidents by percentage.
- 12) Annual Vessel Incident Summary by incident and vessel type.
- 13) Top 5 Vessel Incidents by vessel type.
- 14) Geographic distribution of Vessel Incidents.

Sub-Task 6.2.1.2: Summary Copy of Vessel Data in Electronic Form.

Task 6.3: Description of vessel activities around Southern Resident killer whales.

C.6.3. A Seasonal and Yearly Trends in Vessel Activities Around Whales.

C.6.3.1 Deliverables for Description of Vessel Activities around Southern Resident killer whales.

Sub-Task 6.3.1.1: Vessel Trends in Proximity to Southern Resident killer whales.

- 1) Whale Watching Trends in the Boundary Waters of Haro Strait May-September in numbers of visitors to Lime Kiln Point and number of active vessels from U.S. and Canada.
- 2) Growth of EcoTour (Commercial) Whale Watching in the Boundary Waters of Haro Strait May-September in number of vessels.
- 3) EcoTour (Commercial) Whale Watch Platforms in the Boundary Waters of Haro Strait by percentage of vessel type.
- 4) Average Number of Vessels Accompanying killer whales per Month May-September in number of vessels.
- 5) Annual Average Numbers of Vessels with killer whales at Different Times of Day May-September in number of boats.

- 6) Annual Vessel Type Averages and Maximum Vessel Type Numbers of Vessels with killer whales in Boundary Waters of Haro Strait May-September in number of vessels and by types of vessels.
- 7) Mean Annual Daily Average of Number of EcoTour (Commercial) and Private recreational vessels with whales in Haro Strait Region May-September with Standard Deviation in number of boats.
- 8) Annual Distribution of Vessels within ½ Mile Radius of whales May-September in percentages by vessel type and activity type.
- 9) Distribution of EcoTour (Commercial) Whale Watch within ½ Mile Radius of whales in percentages.
- 10) Distribution of Private recreational vessels within ½ Mile Radius of whales in percentages.

Sub-Task 6.3.1.2: Shore-based kayak education and monitoring program.

Section I: Summary of Activities

The Soundwatch Boater Education Program reduces vessel disturbance to killer whales and other marine wildlife through educating boaters on regional guidelines and regulations as well as providing systematic monitoring of vessel activities around cetaceans. Soundwatch promotes responsible marine stewardship through the development, distribution, implementation, annual evaluation, and adjustment of guidelines and regulations for marine wildlife viewing by residents, visitors, and commercial users. Soundwatch educates boaters on the current guidelines and regulations before they leave the shore; reinforces the learning experience on-the-water where disturbances take place; and provides a scientific platform to collect observational data on vessel activities around cetaceans. This annual long-term data is primarily used to help evaluate effectiveness of current regulations and guidelines and to determine need for adjusting regulations and/or guidelines (Seely *et al.* 2017 and Farrara *et al.* 2017).

The Whale Museum's Soundwatch Boater Education Program has developed standardized procedures for the training of new and seasonal staff with data collection, data entry, and analysis. Soundwatch data collection procedures are designed to follow protocols using regionally established data parameters for SRKWs. Soundwatch staff and paid seasonal vessel drivers are required to undergo on and off-the-water training using standardized instruction. Training protocol states that vessel drivers observe vessel and cetacean interactions and dictate all data observations to interns and volunteers who record the driver's observations onto data collection forms and help hand off educational materials to recreational boaters. Range finding tools such as laser range finders, electronic radar, and chart plotters as well as high-power binoculars are used to gauge distances. In all cases, drivers are instructed to make conservative estimates when determining distance and recording range encroachment. If an observed vessel's distance to a whale is too difficult to ascertain, the driver did not record it; only vessels observed well within the regulatory or guideline approach distances to whales were recorded as vessel incidents.

Soundwatch has collected data on vessel numbers, types and behaviors around SRKWs since 1998. These findings are provided to the whale watch industry, the public and regional

managers. Vessel trend data has been used as the primary data source to inform SRKW recovery strategies in terms of vessel management decisions as well as aided in the creation and/or implementation of San Juan County, Washington State, U.S. and Canadian Federal vessel regulations for killer whales. The annual and long-term data has also been a valuable tool for the training of Soundwatch staff, commercial (EcoTour) vessel and kayak tour operators, and in planning for education and monitoring program efforts.

From May – September 2019, Soundwatch operated vessel patrols to educate and monitor boaters an average of six days per week under National Marine Fisheries Service (NMFS) research issued permit no. 21114. Soundwatch staff and volunteer crews had a total of 114 days of activity, of which a total of 74 days were on the water with marine wildlife between May 12, 2019 and September 25, 2019, totaling 771.0 on the water hours and traveling 4687.7 nautical miles (Figure 1). Killer whales were present on 66 days (15 days with SRKWs and 51 days with Transients), for 289.8 hours, averaging 6.6 hours per day of on the water effort (Figures 2 and 3). Over the summer seasons (May-September) since 1998, Soundwatch has totaled more than 12,683 observational and outreach hours with vessels and whales in the Haro Strait region.

Soundwatch crew included; one full-time paid program coordinator, one seasonal part-time vessel driver/educator, three full-time summer interns, 43 dedicated on-boat volunteers, and many other community volunteers. Over the season 1445.75 hours of volunteer time was spent participating on Soundwatch vessel patrols, distributing educational materials, vessel maintenance, dock talks, assisting with data entry and photo archiving. Soundwatch staff, the seasonal vessel driver, interns and volunteers, totaled 48.5 hours of off-the-water outreach and education during “Dock Talk” events. Additional off the water training and a thorough knowledge of all data was required before permitted activities were allowed.

The on-the-water crew operated with a minimum of two and a maximum of four crew members. Equipment utilized in 2019 consisted of a 17’ American Eagle rigid hulled vessel, *R/V Raydiance* and a 19’ Safe Boat rigid hulled vessel, *R/V L-98*, operated as a secondary vessel. Funding for this secondary vessel was provided by the National Fish and Wildlife Foundations Killer Whale Conservation and Research Grant. *L-98* operated for 15 monitoring days throughout the 2019 season. Both vessels were fully equipped with safety equipment, VHF radios, and chart plotters. The radar unit on *R/V L-98* is utilized for accurate distance calculations of vessels, and on poor weather condition days. *R/V Raydiance* is not equipped with a radar, but does have a Garmin GPS unit.

Soundwatch and Washington Department of Fish and Wildlife (WDFW) received a Section 6 ESA Grant that has helped provide funding through June 2019, enabling both programs to maintain vessels and operate on the water on a more consistent basis.

In 2019, 648 Vessel Count/Whale surveys were conducted on a variety of cetacean species, the majority being Transient (Bigg’s) killer whales 63% (407 counts), then Southern Resident killer whales 24% (155 counts), and Humpback Whales 13% (86 counts) in the Haro Strait Region of Washington State, U.S. and Southern Vancouver Island, British Columbia, Canada (Figure 3). Soundwatch observed more killer whale groups in the Haro Strait region than in past years. As a result, vessel monitoring was spread over a larger region in the space of a single day. Additional

educational outreach included 101.5 hours of dedicated off the water dock talks, reaching approximately 1,796 guests at local harbors and marine, and 75 local guides taking and passing the Kayak Education Leadership Program (K.E.L.P.).

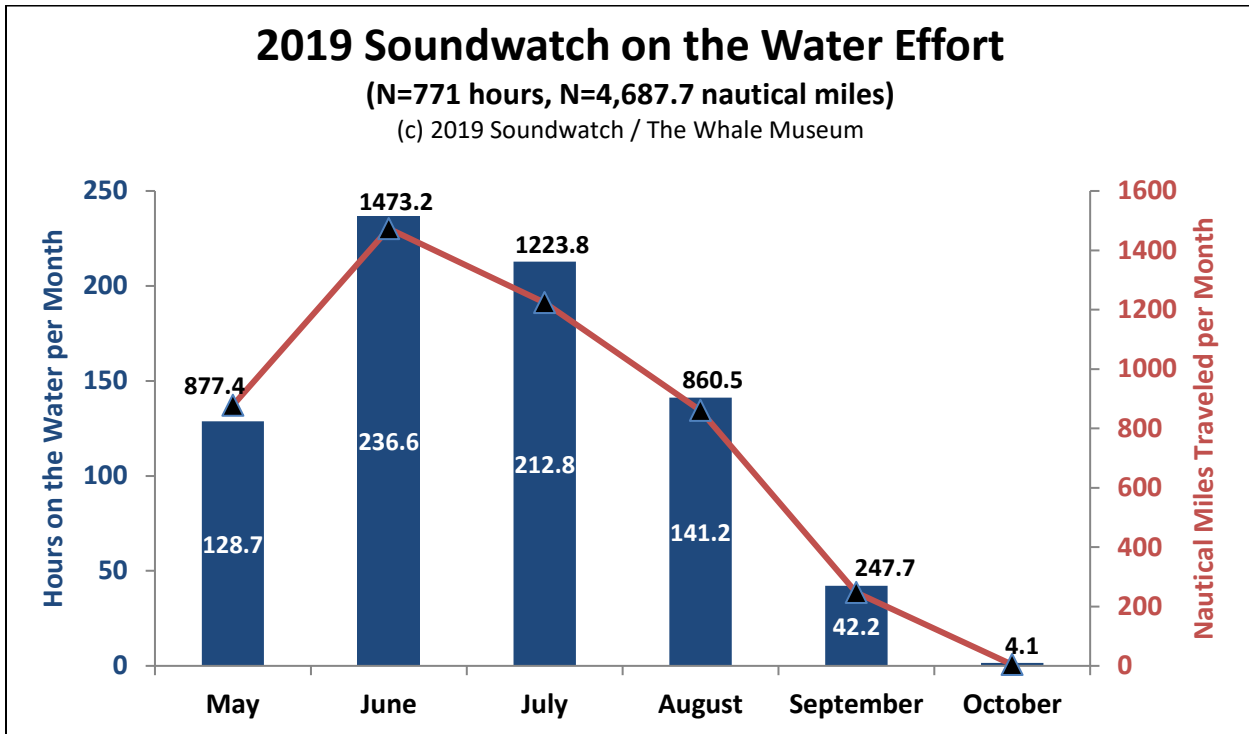


Figure 1: Distribution of Soundwatch vessel hours and miles by month for 2019.

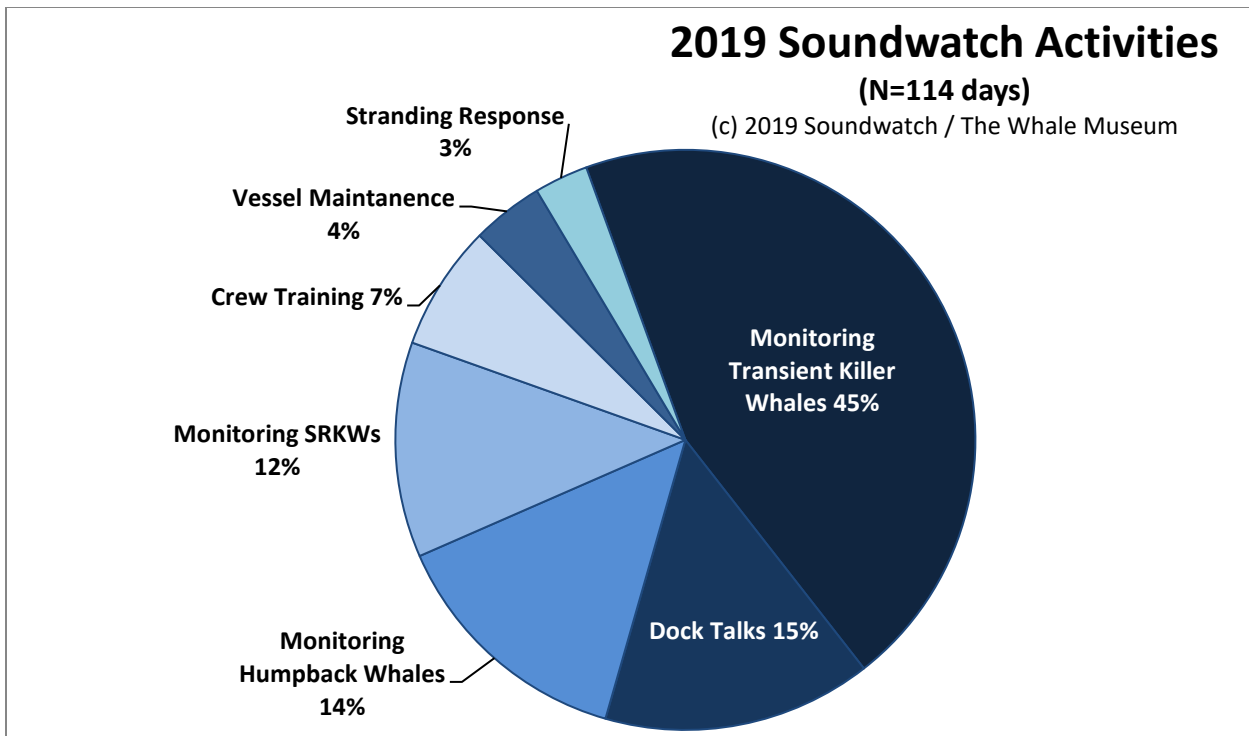


Figure 2: Soundwatch activities during the 2019 season.

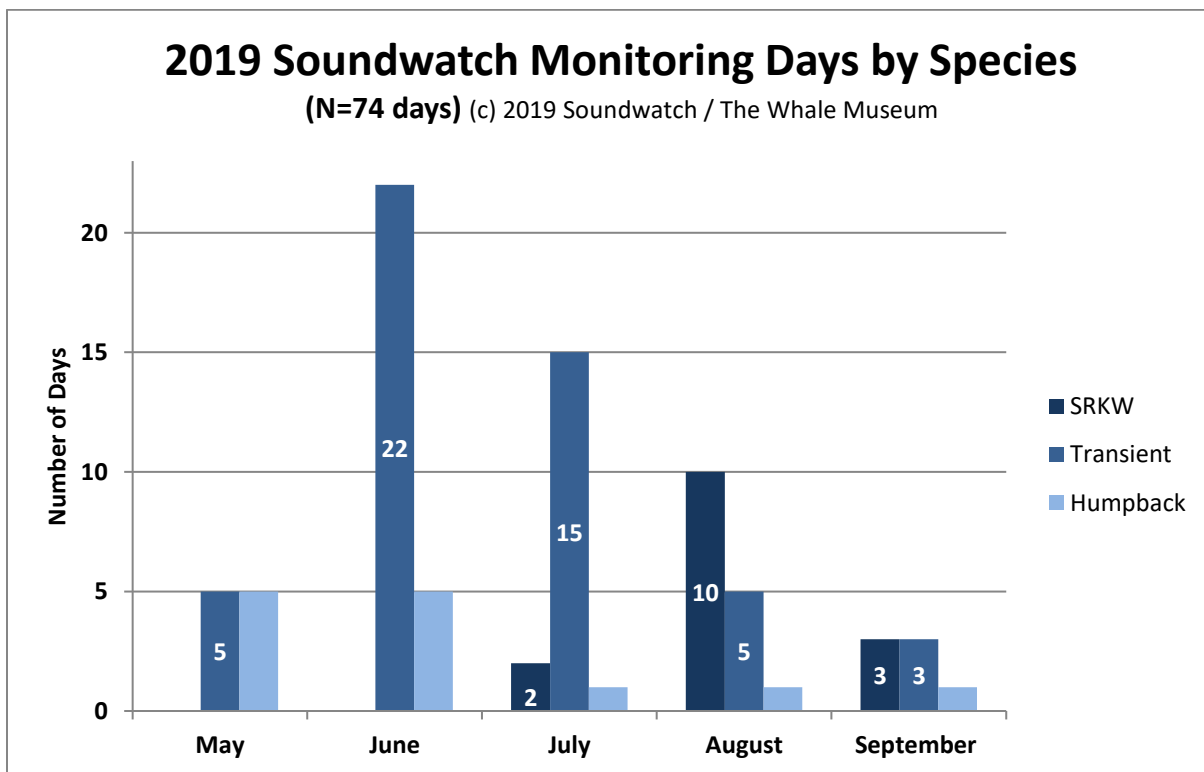


Figure 3: Distribution of Soundwatch monitoring days by species in the summer 2019 season.

Whale Watching Trends

Soundwatch has created an annual vessel catalog with the number of Eco Tour companies, vessels, trip frequency, and homeports engaged in whale watching activities based from on-the-water observations from May-September. On-the-water observations included fishing and overnight charters that were engaged in whale watching, although that may not have been a primary focus of their business. Those companies were placed in either 'occasional' or 'rare' vessel frequency categories. Vessel frequency definitions are: 'active' is greater than one day per week from May-September; 'occasional' is less than one day a week from May-September; and 'rare' is equal to or less than once a month from May-September. For simplicity, all companies that were no longer in operation ('inactive') were not included in total company/vessel counts.

In 2019, 55 total EcoTour whale watch companies offered whale watching trips from 100 'active' vessels in the U.S. and Canadian Haro Strait region and 18 'occasional' vessels and 20 'rare' vessels. In 2016, the highest number of active vessels was recorded at 109 and declining slightly since (Figures 4-5). A combined total of 138 commercial vessels could potentially be on the water at any given time. Notable changes in the composition of the commercial whale watching fleet this year include the addition of a second large high speed catamaran to the Prince of Whales fleet, a few Prince of Whales vessels being moved to the Johnson Strait, Island Adventures sold one of their large vessels, and Mystic Seas Charters closed its doors after 28 years in business.

Since 1998, the majority of U.S. and Canadian EcoTour companies operating in the transboundary waters were members of the Pacific Whale Watch Association (PWWA). PWWA is currently comprised of 31 members, including one dedicated sport fishing charter, one dedicated kayak company, and other eco-tour companies that offer whale watching and kayaking. There are 100 active vessels operating from 30 departure locations by the 14 Canadian and 17 USA PWWA members. Of the Active EcoTour companies on the water, 86% Canadian companies are members of the PWWA and 94% of US companies are PWWA members (Figure 6-8). Historically, Canadian EcoTour vessels mostly smaller rigid hull inflatable (RHIB) style vessels, while the U.S. fleet is made up of larger passenger-style vessels, with a growing number of smaller 6 - 8 person fiberglass vessels. Recently, the trend has been to add larger passenger-style vessels to the fleet. However, three U.S. companies are now operating RHIB style vessels that hold between 10-25 approximate passengers.

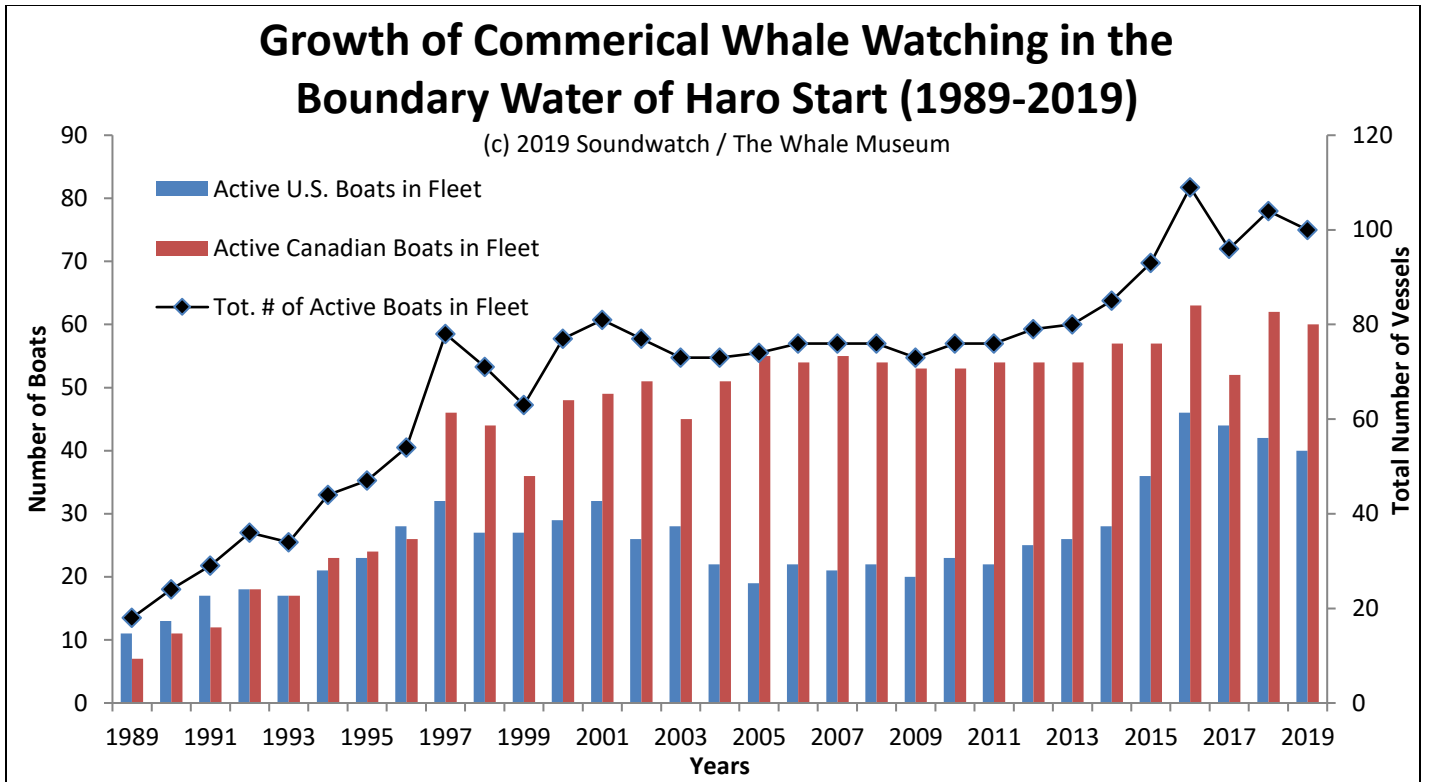


Figure 4: Growth of commercial whale watching in the Salish Sea 1989-2019. Companies

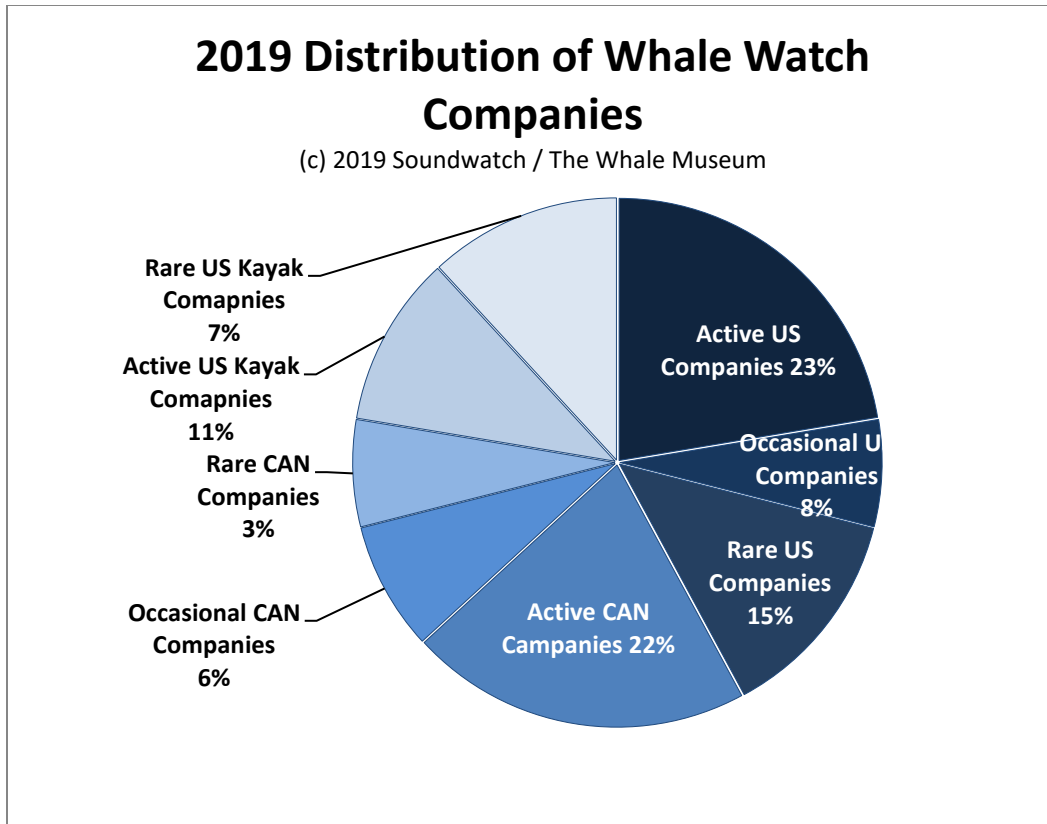


Figure 5: Distribution of whale watch and kayak companies from the USA and Canada in 2019.

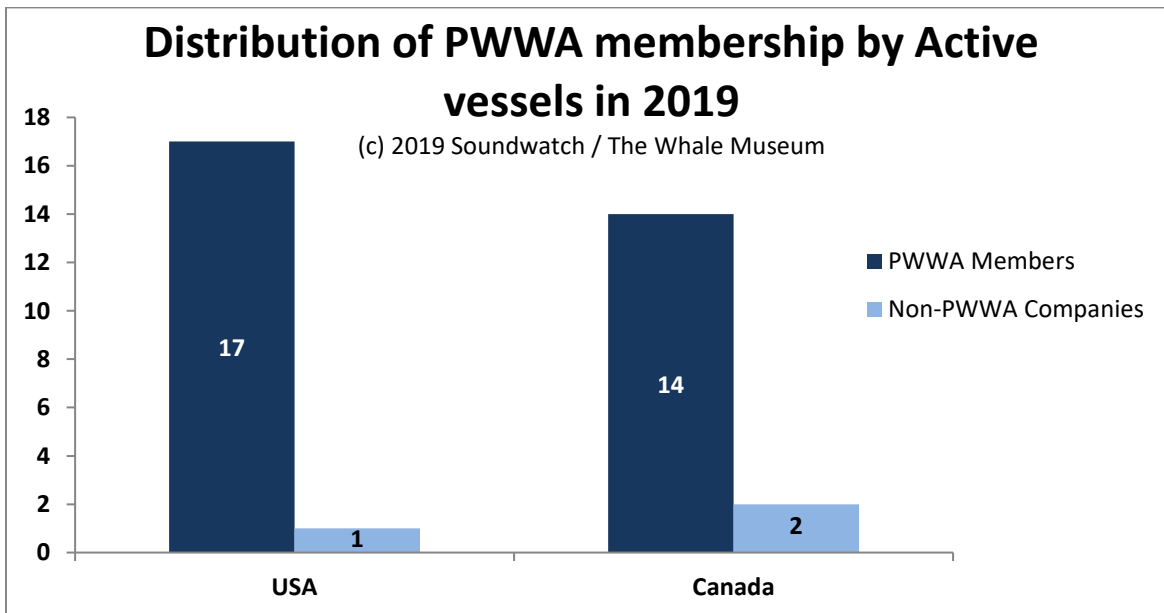


Figure 6: Distribution of Active whale watch companies that are also members of the Pacific Whale Watch Association in 2019.

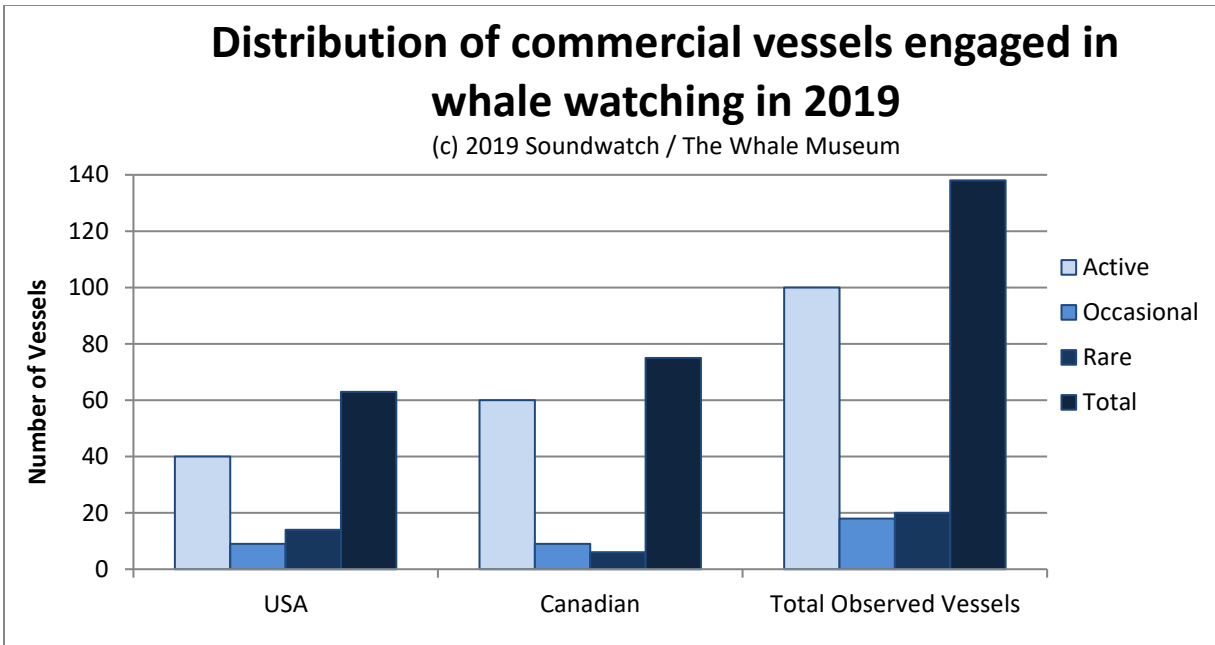


Figure 7: Distribution of total commercial vessels (N=138) engaged in whale watching in 2019.

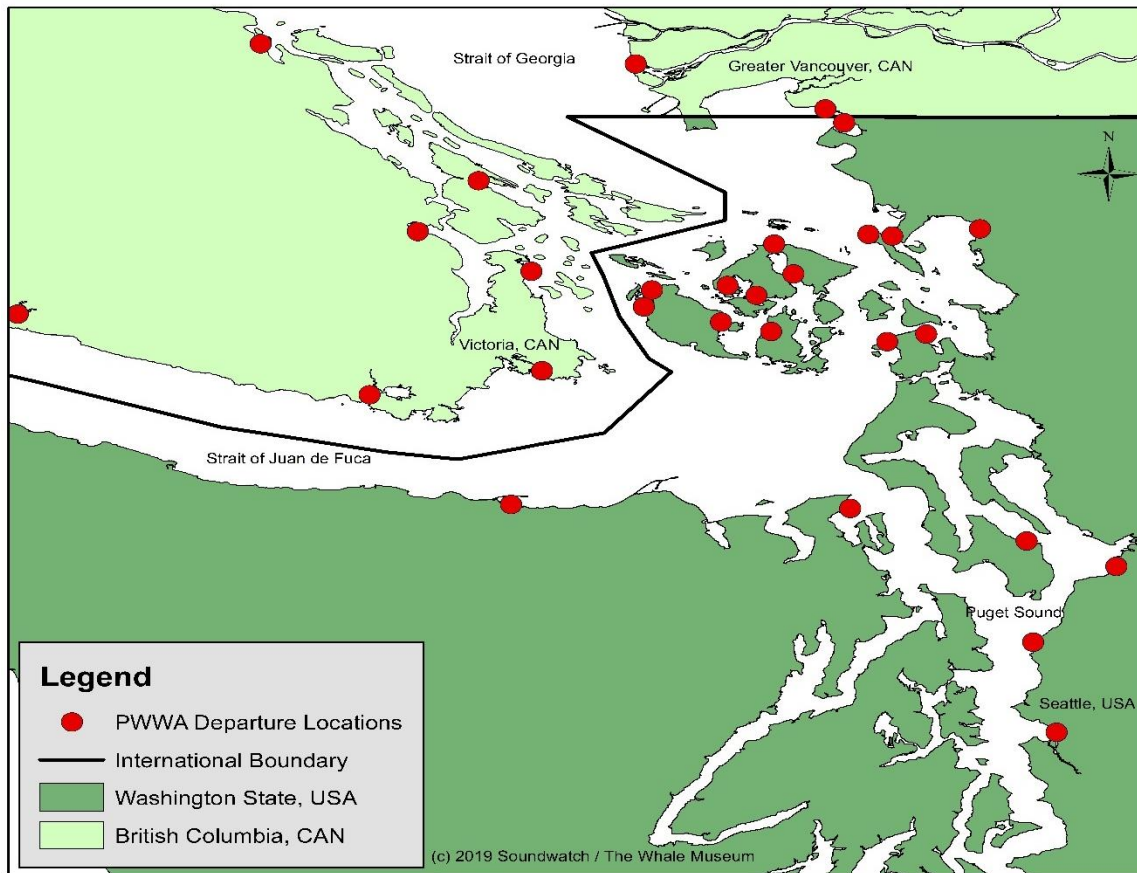


Figure 8: PWWA member vessel departure locations in 2019.

Many shore-based whale watching areas have gained popularity in recent years due in part to the availability of real-time sighting reports using various social media and the efforts of groups. Lime Kiln State Park/Whale Watch Park estimated the total number of visitors in 2019 to be approximately 244,616 people, approximately 17,000 less people than 2018 (Figure 9). Attendance data for Lime Kiln was provided by Washington State Parks Office in Olympia, Washington.

Soundwatch primarily observes commercial kayak presence on the west side of San Juan Island, due to commercial companies launching from San Juan County Park on San Juan Island. Therefore, kayak data is primarily dependent on the location of whales and the Soundwatch vessel during vessel monitoring surveys. The increased presence of Transient (Bigg’s) killer whales resulted in Soundwatch operating further offshore and further from San Juan Island’s west side. Commercial kayaks were present for 23 vessel counts over 12 days in Soundwatch vessel counts along the west side of San Juan Island from May-September 2019. Kayak company activity frequency was updated in the vessel catalog based on San Juan County Park sign-in sheets, company websites, and personal communications (this does not take into account the kayak companies based on other islands within San Juan County that launch from different parks). The number of EcoTour kayaks being launched from San Juan County Park has decreased since 2015 with a large decrease from 2018 to 2019. However, the exact cause of the decrease is unknown, the decrease could be due to companies utilizing alternate launching sites on San Juan Island, such as Friday Harbor (Figure 10).

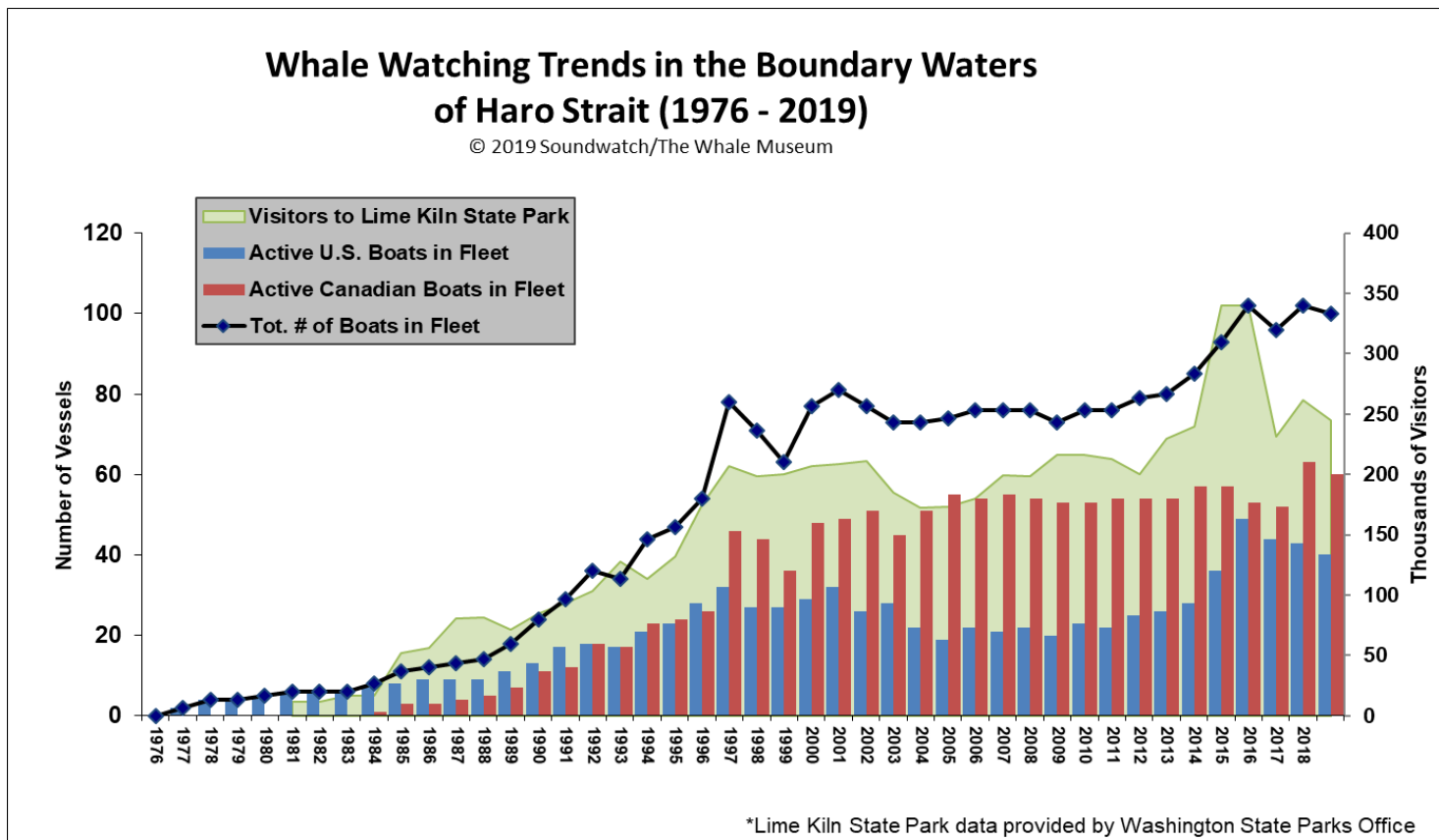


Figure 9: Growth of whale watch industry including Lime Kiln Point State Park visitors in 2019.

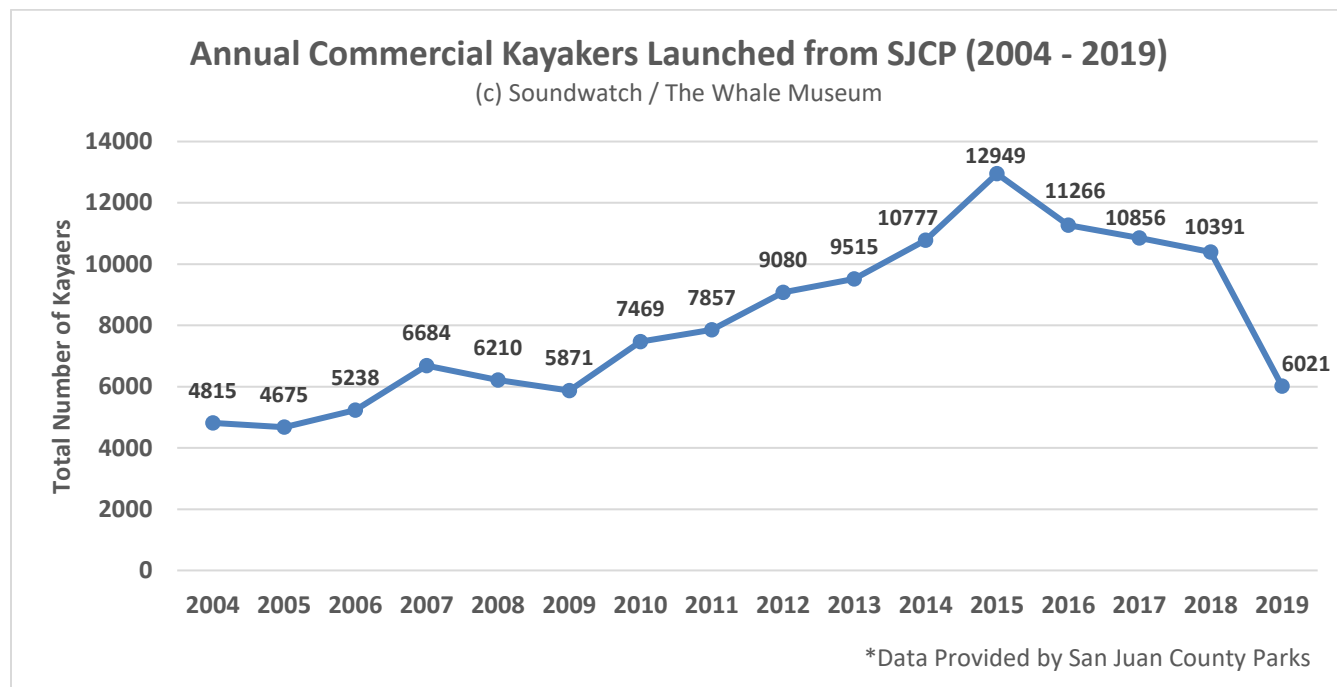


Figure 10: Number of commercial kayakers launched from San Juan County Park on the west side of San Juan Island. The total number represents individual kayakers and not the total number of kayaks launched.

Education & Outreach

When Soundwatch crews encounter recreational vessels traveling in known whale or other wildlife areas, they contact the vessel, provide marine wildlife viewing guidelines and regulations as well as collect data on the interaction. Soundwatch distributed the current *Be Whale Wise Marine Wildlife Guidelines for Boaters, Paddlers and Viewers* that was updated in 2019 to include the *U.S. Federal Vessel Regulations for Killer Whales* (Appendix A1 & A2), updated Washington State code (RCW 77.15.740) and the Transport Canada

In July 2016, The Whale Museum installed a permanent exhibit featuring *Be Whale Wise*, Federal and State regulations for killer whales, and vessel effects on killer whales. The exhibit has been viewed by approximately 104,000 museum visitors and education program participants, 31,000 visitors in 2019 alone. In addition, materials were given to approximately 2,932 people through either The Whale Museum’s Memberships and/or Orca Adoption Program.

The Soundwatch Kayak Education and Leadership Program (KELP) targets outreach to recreational and EcoTour kayakers and includes all other human-powered vessels such as paddle boards and canoes. Since 2010, Soundwatch has been contracted by San Juan County Parks to assist with the planning and implementation of a seasonal vessel launch permit, a Kayak Vessel Code of Conduct education program, and to collect data on kayaker use trends at the San Juan Island County Park (SJCP). The San Juan County Park administered the permit system, implemented the outreach program and reported 6,021 kayakers launched from the park in 2019 (Figure 10). From 2013 - 2019, Soundwatch provided kayak guide training (K.E.L.P.) and the

County Park provided narrated slideshow training for recreational boaters to view before launching. The slideshow at SJCP was updated in 2019 to review more of the *Be Whale Wise* guidelines and updates to the State vessel regulations. Data collection on vessels launching from the park was done through a boater self-reporting system and was administered by the San Juan County Park staff. (Appendix C and D). The 2019 updated *Be Whale Wise* brochures were also distributed at San Juan County Park for recreational boaters.

When kayakers were approached on the water, Soundwatch driver/educators communicated the special concerns for kayakers paddling around marine wildlife and additionally distributed the current *Kayakers Code of Conduct Rack Card* (Appendix F). A *Kayakers Code of Conduct* brochure (Appendix E) was updated in 2016 and distributed to all kayakers who attended the KELP training at San Juan County Park. Returning guides (one year or more of experience in the Salish Sea) were required to pass the online exam with a 90% or higher. New guides were required to pass with an 80% or higher. The idea was to create a greater sense of responsibility and understanding of the regulations and guidelines amongst the guides. Kayak Education and Leadership Training Video can be found using the following link: <https://youtu.be/QOoqcakYc-g>. In 2019, 75 EcoTour guides completed the test under guidance of Soundwatch / The Whale Museum staff. The average test score from 87 attempts was 92%. (Guides were allowed one re-take of the exam if they did not achieve the required score in the first attempt.)

During 2019, Soundwatch delivered *Be Whale Wise* and *U.S. federal/state vessel regulations* for killer whales to 468 recreational vessels reaching 1,469 recreational boaters (Figure 11). Soundwatch contacted an average of 3.23 persons per vessel. The decrease in recreational vessels contacted from 2018 (487 vessels and 1,551 boaters in 2018) is most likely due to the reduced presence of the SRKWs in the central Salish Sea throughout the season. Through shore-based outreach and education Soundwatch conducted 101.5 hours of Dock Talks at Friday Harbor, Roche Harbor, and Deer Harbor, contacting 1,796 people.

Through continuous Soundwatch monitoring, vessels arriving on scene are observed and contacted, as are vessels that Soundwatch previously contacted but require some kind of follow-up. Every time a vessel is contacted, specific contact information is recorded on a *Soundwatch Vessel Contact data sheet* (Appendix G). Soundwatch crews record the date, time, location, type of vessel contacted, the vessel activity, vessel registration, name, port of origin, and number of passengers on board. Soundwatch crews then determine a series of vessel operator attributes using standardized criteria while the Soundwatch driver informs them about the marine wildlife rules. Vessel operator attributes that Soundwatch records include: why the vessel was contacted, whether they took additional *Be Whale Wise* printed materials and, if not, whether they were previously aware of vessel guidelines, what was their reaction to Soundwatch, and whether this vessel had been contacted by Soundwatch before. Additionally, Soundwatch crews record if Soundwatch re-contacted this same vessel again on the same day, if there was a Soundwatch observed vessel incident recorded with this vessel before or after contact. If so, the time of the incident is recorded, if there were photos of this vessel, and any other relevant comments. Dot Density maps represent the number of vessels from ports in the Salish Sea (Figure 12). Registered ports most contacted were Anacortes, Bellingham, Friday Harbor, and Seattle, Washington and Vancouver and Victoria, British Columbia between 9 and 35 vessels contacted by Soundwatch in 2019. Homeports were also recorded from Washington state all the way to the

state of Virginia (Figures 13). Vessels that are not registered through a Coast Guard Agency are registered only by state with a number, 56 vessels were just registered to British Columbia and 120 to Washington State.

Boaters were asked if they were familiar with the *Be Whale Wise* and *U.S. federal/state vessel regulations* for killer whales. Of the vessels contacted, 25% were correctly aware of the guidelines and laws, which is a decrease from 36% in 2018 (Figure 18). This decline could be related to the changes in both the Washington state regulations and the Canadian Interim Order in 2019. To increase this knowledge and compliance with guidelines, Soundwatch is partnering with many organizations to broaden our outreach message, such as the Seattle Boat Show and Whale Warning Flag, which will be discussed in detail later. Of vessels contacted 38% were transiting through the area and 60% were actively engaged or intended to engage in whale watching activities, and 2% of vessels were engaged in fishing in proximity to killer whales (Figures 15 - 17). This breakdown of activity of vessels is very consistent over recent years, for example in 2018 59% of vessels contacted were whale oriented and 38% were transiting.

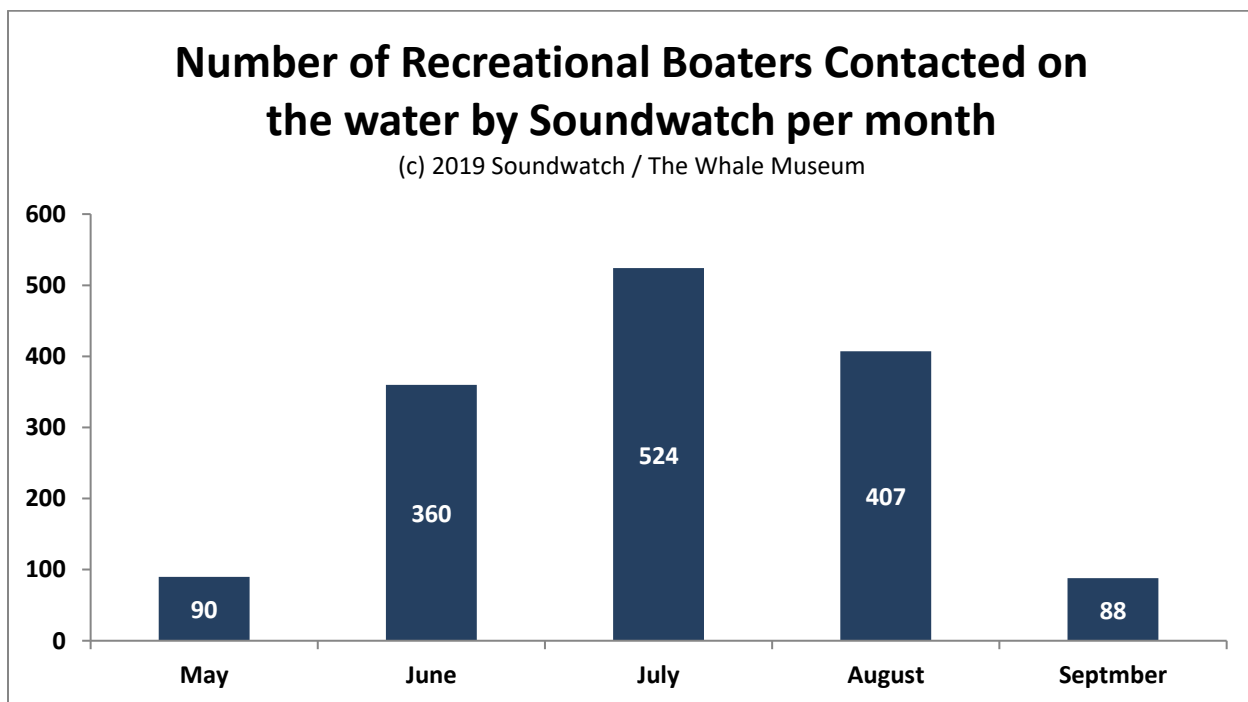


Figure 11: Number of recreational boaters (n=1,469) contacted by month on the water by Soundwatch for either prevention and/or education on vessel disturbance to killer whales in the region.

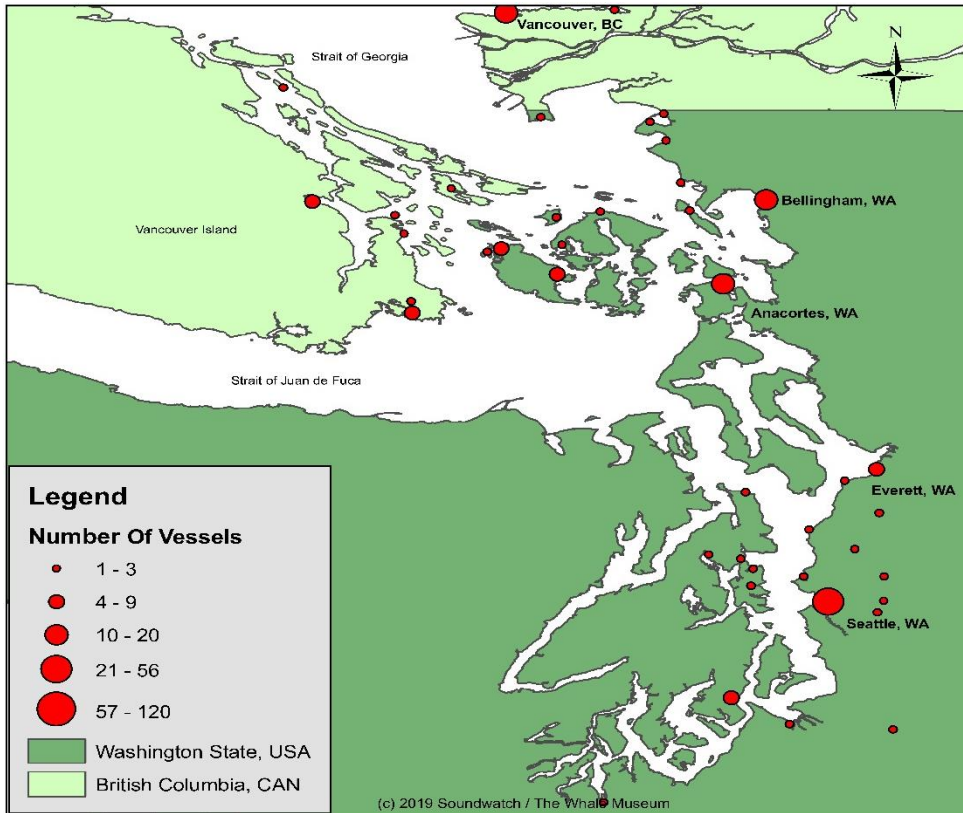


Figure 12: Recreational vessel home ports in the Salish Sea, as recorded by Soundwatch from May – September 2019.

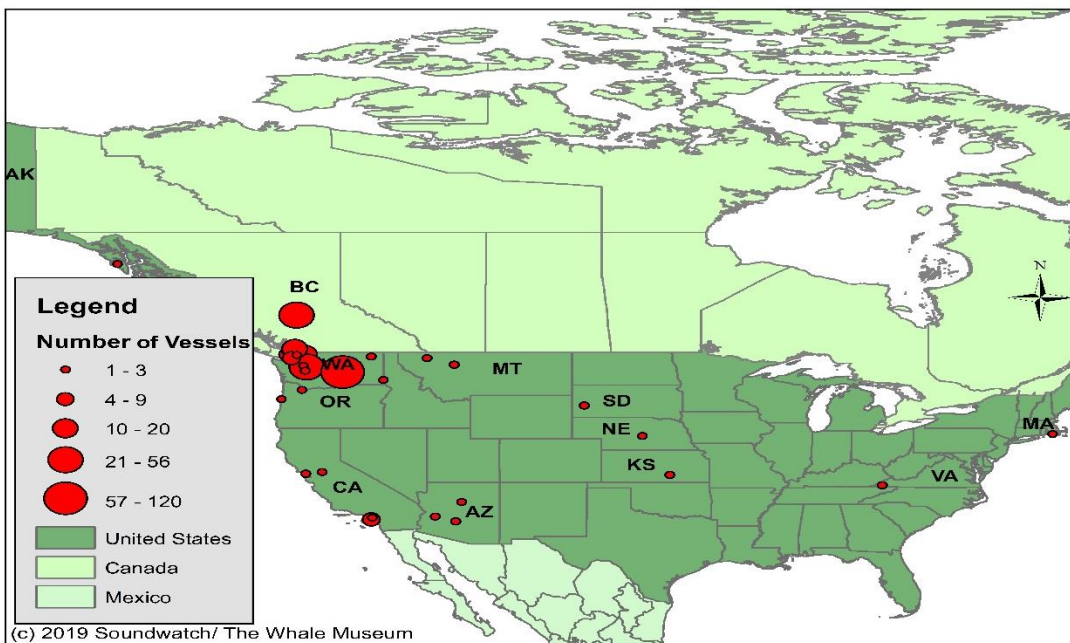


Figure 13: Recreational vessel home ports outside of the Salish Sea within North America, as recorded by Soundwatch from May – September 2019.

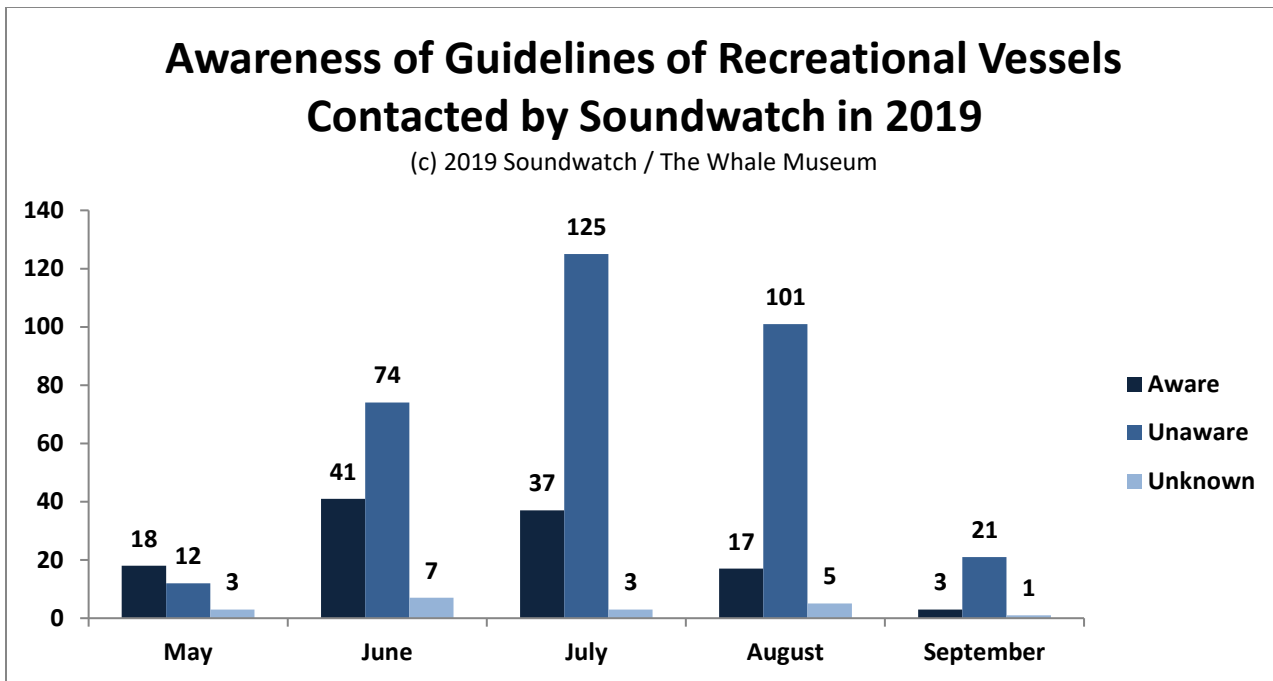


Figure 14: Number of Recreational vessels contacted and the awareness of Be Whale Wise Guidelines by month in 2019.

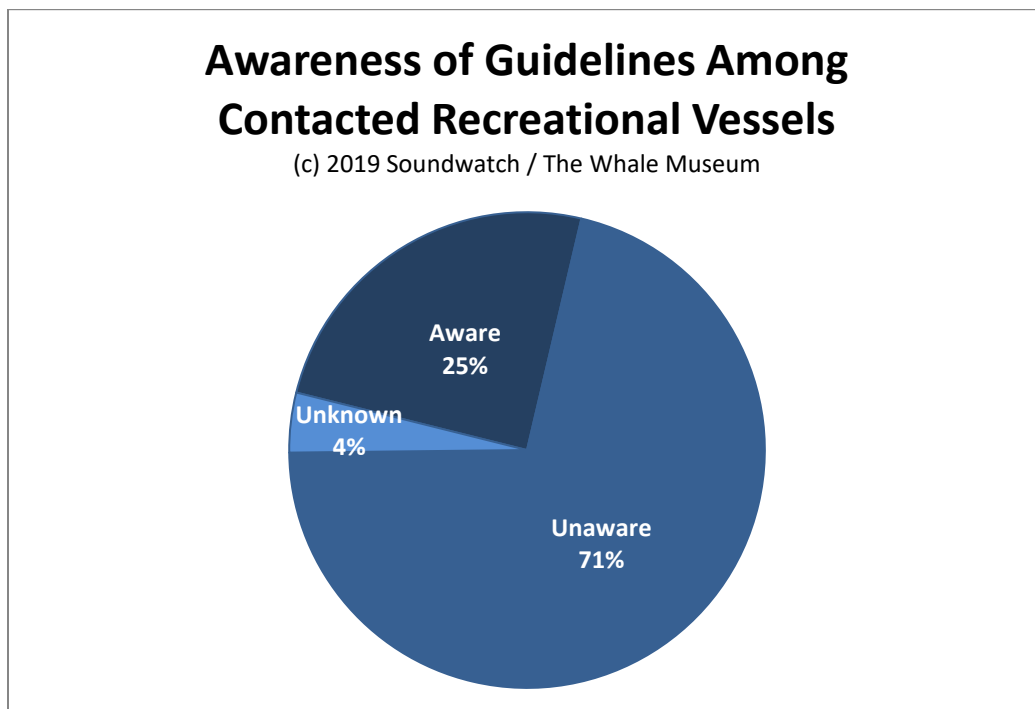


Figure 15: Awareness of guidelines among contacted recreational vessels in 2019.

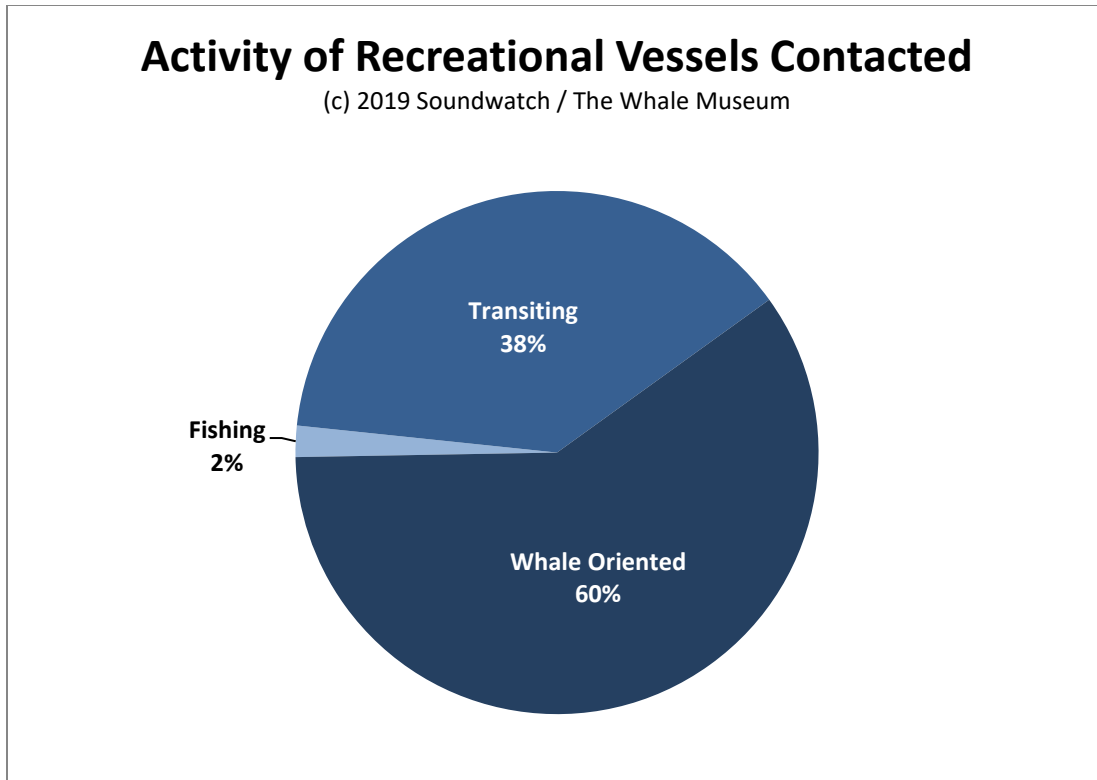


Figure 16: Observed Activity of Recreational vessels contacted by Soundwatch in 2019.

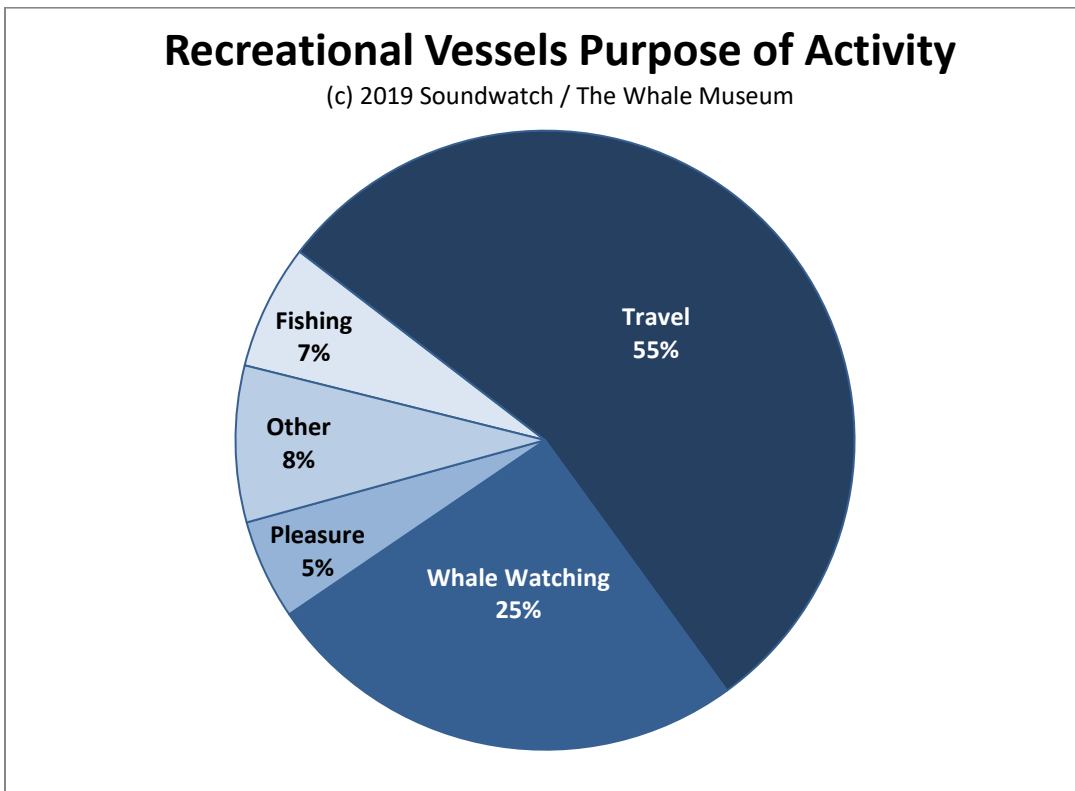


Figure 17: Soundwatch Recreational contact responses to “Reason/purpose for visiting the region?”

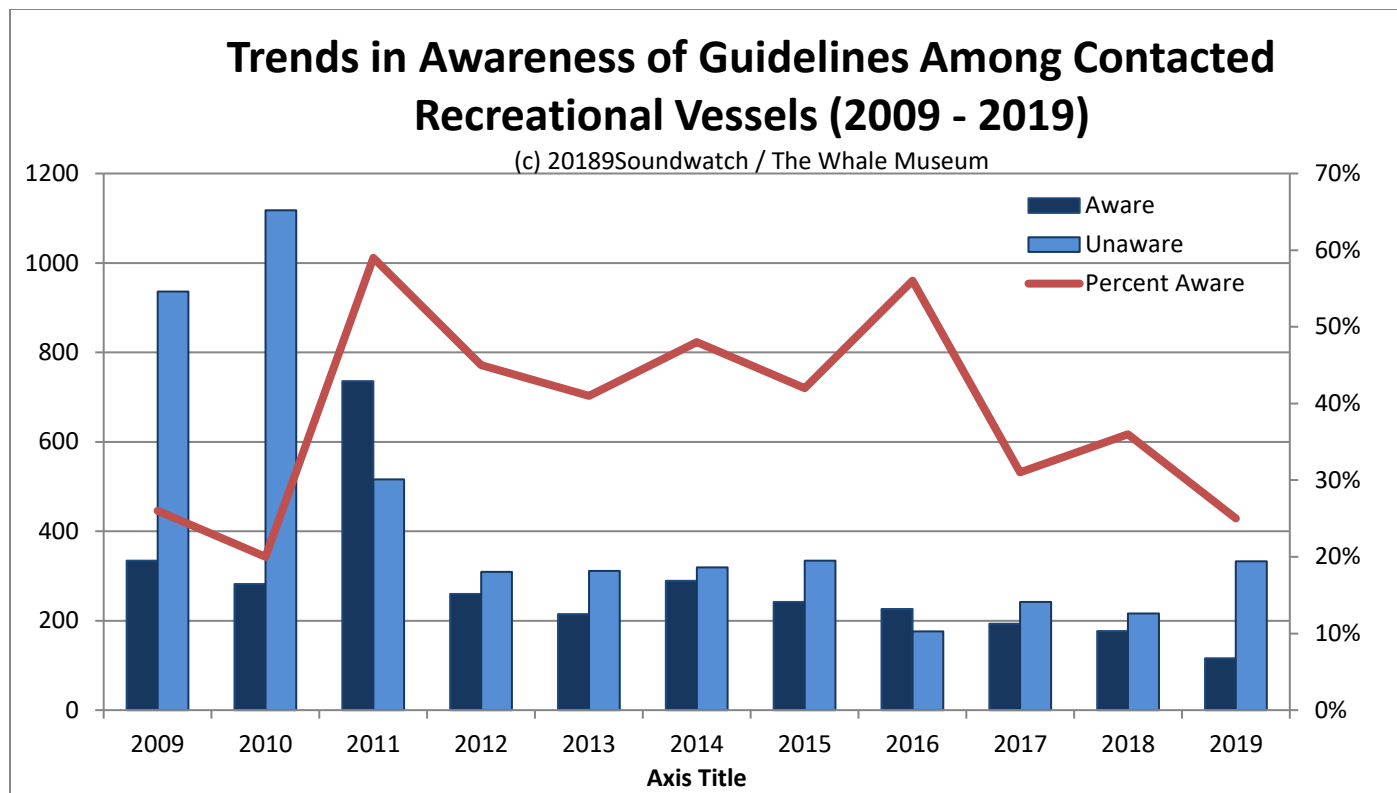


Figure 18: Trends in Recreational Vessels Awareness of Guidelines Contacted by Soundwatch from 2009 – 2019.

Vessel Monitoring

Surveys of whales and a count of vessels within one half-mile of whales are collected every half-hour using a *Soundwatch Vessel Count/Whale Survey data sheet* (Appendix I & J). Soundwatch staff and volunteer crews record whale and vessel data using a set of standardized vessel type and vessel activity definitions as well as whale attributes agreed upon by U.S. and Canadian cetacean researchers (2004 NOAA SRKW workshop) (Appendix K1 & K2). Vessels within one half-mile (880 yards) of all known whale activity are counted according to type and vessel activity (Figure 19). The area of known whale activity is variable and not limited to a half-mile, but rather represents the core of individual whales or groups of whales in the immediate area and can range up to one mile. Often the whales are more spread out than one mile. When visibility and conditions are good, a secondary count is made for the group of vessels and whales beyond one mile that the Soundwatch staff can reliably record beyond the primary count, but that the Soundwatch vessel is not with. A count confidence level is determined by choosing it to be an ‘A count’ (highest confidence and usually the count the Soundwatch vessel is in) and a ‘B count’ still reliable enough to count, but with less confidence and usually the count that the Soundwatch vessel is not in.

Each observed vessel within the count range is categorized according to a vessel type and a specific best-fit vessel activity to describe what the vessel was engaged in (Appendix I). Vessel activity categories include *transiting* (moving through the area within one half mile); *whale oriented* (moving or stationary whale watching); *fishing* (moving or stationary with poles or nets

in the water); *research* (engaged in any type of research, including cetology); *enforcement* (enforcement vessel in pursuit or engaged with a vessel at the time of the count); *acoustic* (outside of the count range one half mile, but in acoustic/visual range); *or other* (which must be described, such as a rescued vessel in tow, etc.).

Vessel incidents, observations of vessels operating contrary to current voluntary guidelines and regulations, are recorded using standard definitions. Descriptions of guidelines and regulations, along with the incident codes used to record incidents of regulation and guideline violations can be found in Appendices J1 & J2. Incidents are recorded opportunistically as they are observed using a *Vessel Incident datasheet* (Appendix H). Soundwatch staff are conservative in recording incidents.

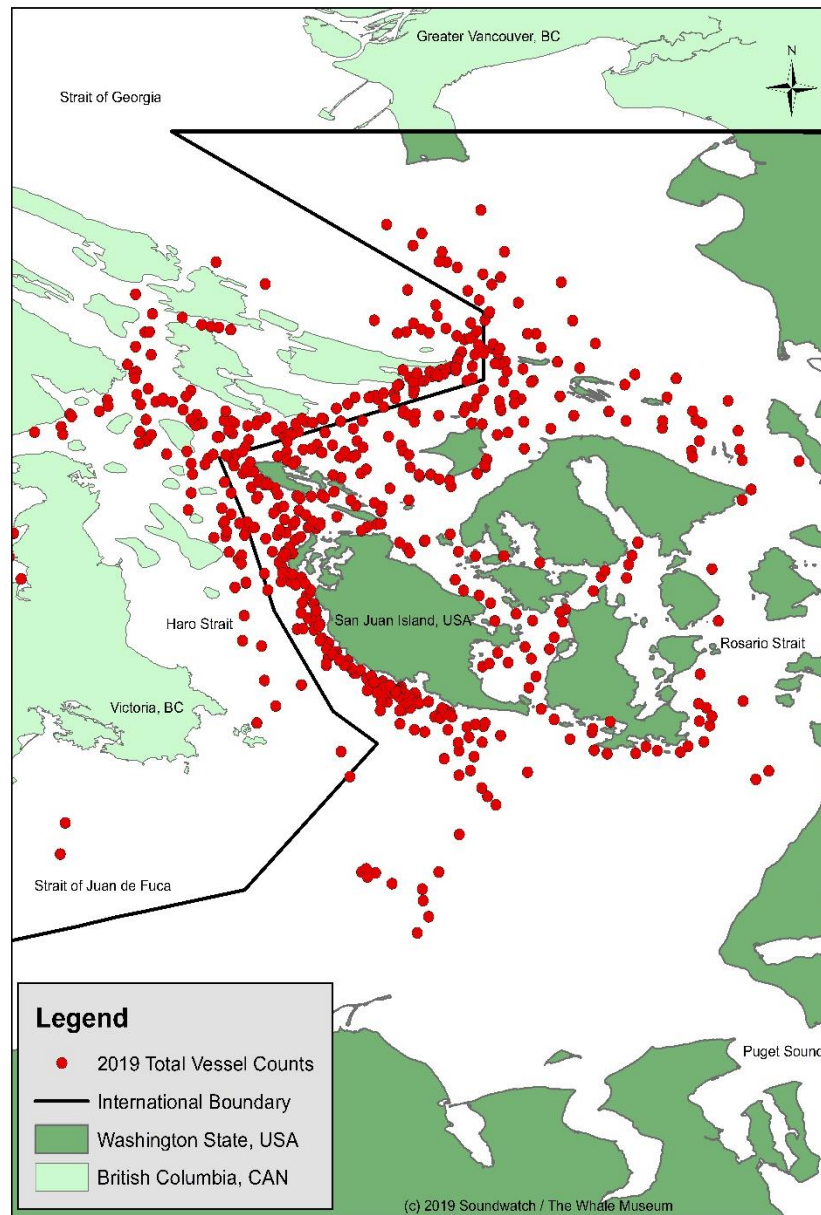


Figure 19: 2019 Soundwatch 648 Vessels Counts by location.

Soundwatch Vessel Count Trends

Plotting annual locations of Soundwatch vessel counts can be used as an overall indicator of Soundwatch effort and can be compared to annual and long term SRKW habitat use maps generated by The Whale Museum's annual Orca Master Program and presented in annual NOAA Contract Reports (Appendix N). Comparing annual SRKW sightings data with Soundwatch vessel monitoring effort confirms that the Soundwatch program targets effort where the majority of SRKW sightings occur and where the largest concentrations of vessels and whales are likely to be found.

Soundwatch totaled 70 vessel/whale days and 648 vessel counts. U.S. EcoTour vessels were observed 70 days and in 542 vessel counts, Recreational 68 days and 496 counts, Canadian EcoTour 64 days and 424 counts, Research 28 and 142 counts, Enforcement 22 days and 85 counts, and kayaks (ecotour and recreational) 19 days and 32 counts.

The Soundwatch study area is separated into zones based on the TWM data quadrants and marine fishing zones for the U.S. and Canada. Soundwatch was able to concentrate surveys on locations of vessels engaged in whale watching activities. This year most vessel counts were taken in northern Haro Strait off the west side of San Juan Island and in Boundary Pass (Figure 20 and 21). In 2018, and historically, Haro Strait had the highest number of vessel counts within a half mile of San Juan Island shoreline (Figure 22). However, with decreasing presence of SRKWs and increased sightings of Transient killer whales the west side of San Juan Island is less frequented by whale watching vessels (Figure 23).

There are obvious trends of overlap in overall whale habitat use and vessel activities within a half mile of the whales, including whale watching, fishing, transiting as well as acoustic influence from large vessels transiting greater than a half mile from whales. The majority of vessel counts by Soundwatch in 2019, tended to be within north Haro Strait (Zones 2 and 5), the waters surrounding the San Juan Islands (Zone 4), and Rosario Strait (Zone 8). These areas are also the areas frequently used by Transient killer whales, which may explain why the west side of San Juan Island was not the highest vessel count zone in 2019. The Southern Residents were seen in the inland waters of Washington state and British Columbia the least out of any year that data has been collected, with all pods being absent from the inner Salish Sea during the month of June.

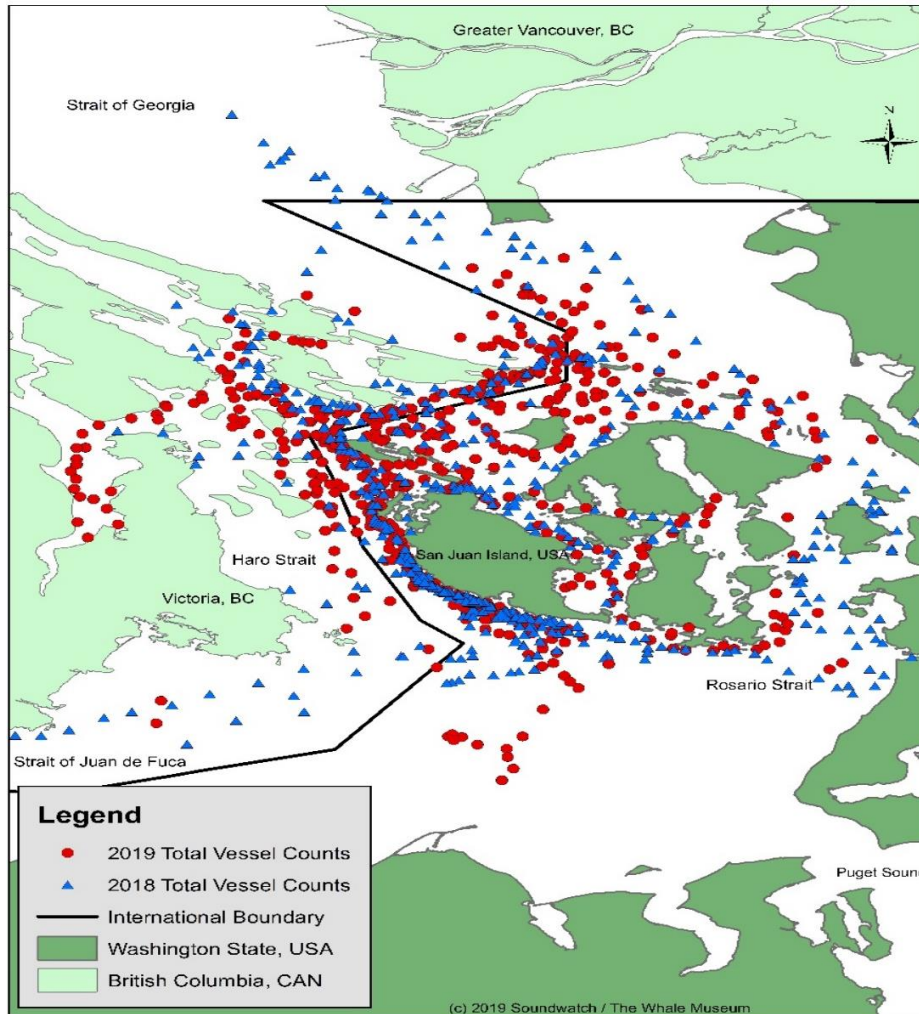


Figure 20: Total Vessel Count Locations from 2018 and 2019, displaying differences in survey locations and distributions.

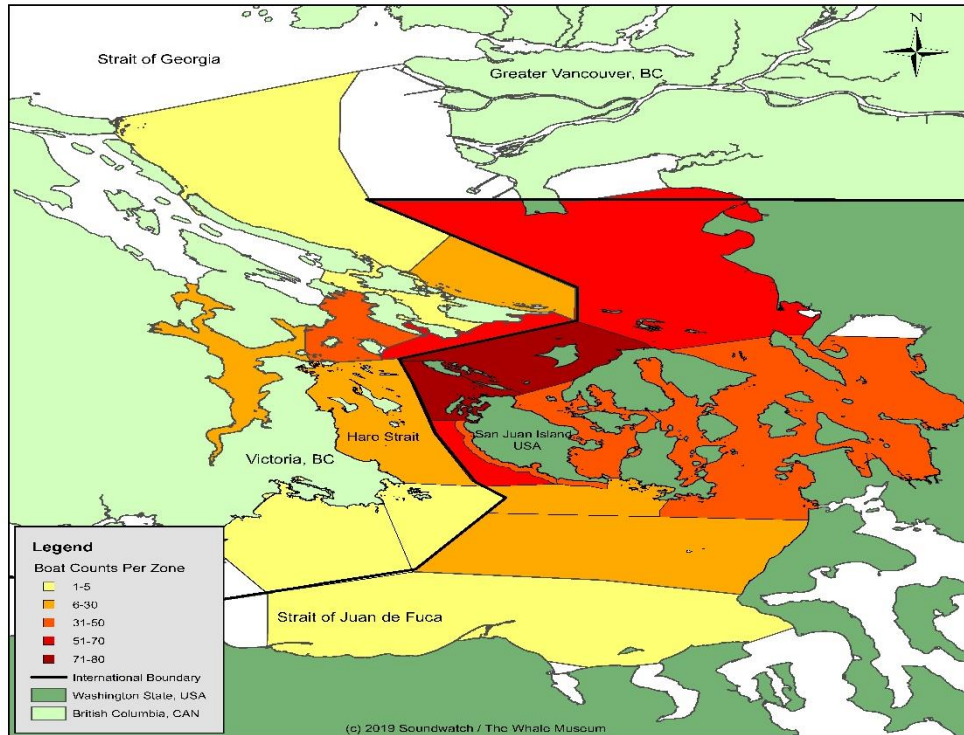


Figure 21: 2019 Soundwatch Total Vessel Counts by Numbered Zone.

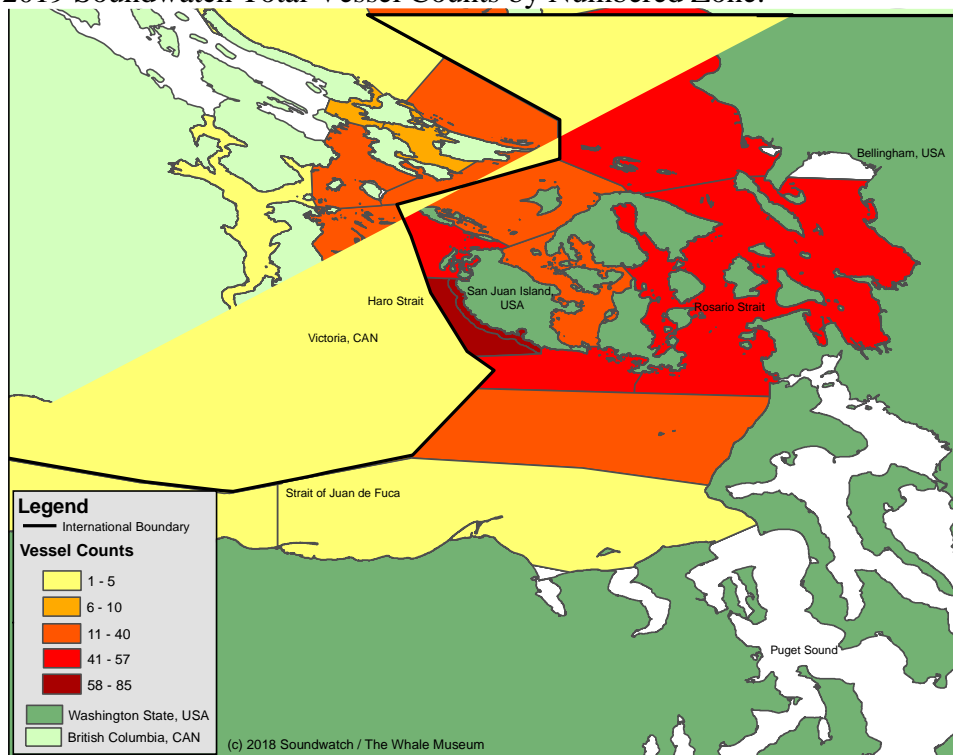


Figure 22: 2018 Soundwatch Total Vessel Counts by Numbered Zone for reference.

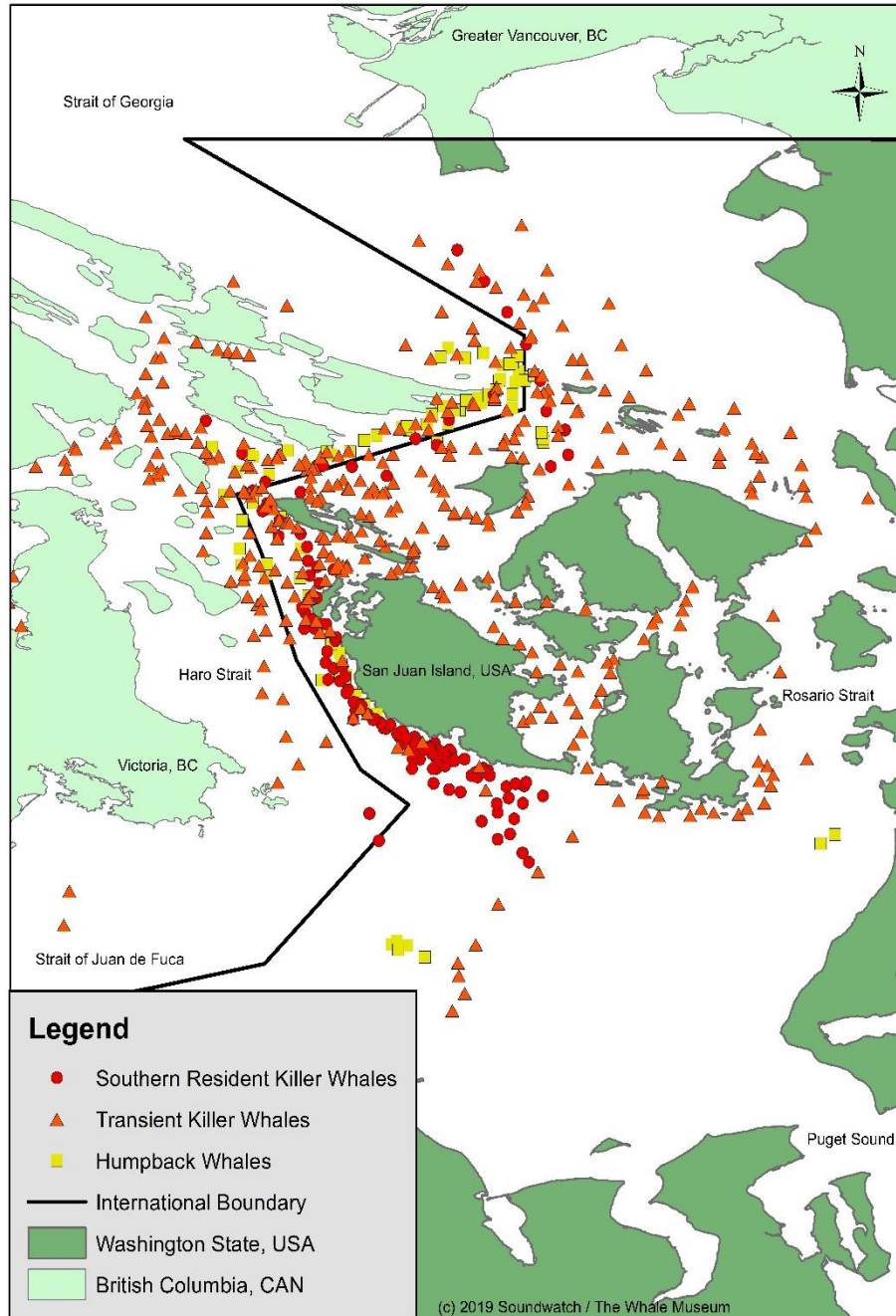


Figure 23: 2019 Vessel Counts by species of cetacean observed within the count.

Section II: Patterns of Vessel Activities around Whales

Figure 24, displays the type and number of vessels around whales in 2019. U.S. EcoTour and Recreational vessels had the greatest presence around whales with Canadian EcoTour coming in third highest. Numbers of Canadian Eco Tour vessels decreased throughout the summer, potentially due to the Transport Canada Interim Order and greater number of groups of Transient killer whales closer to vessels home ports. This will be discussed later. EcoTour (Canadian and

U.S. commercial wildlife tours) vessel category accounted for 56% and Recreational accounted for 17% of vessels ‘whale oriented’ in 2019 Soundwatch vessel counts (Figure 25). Soundwatch and Straitwatch accounted for the second highest presence (after combined U.S. Eco Tour and Canadian Eco Tour vessels) in vessel counts, an increase from 2018 showing how much effort the monitoring programs put in during the season, and potential decreases in other types of vessel presence. Vessel presence was 68% whale oriented within one-half mile of the whales (Figure 26).

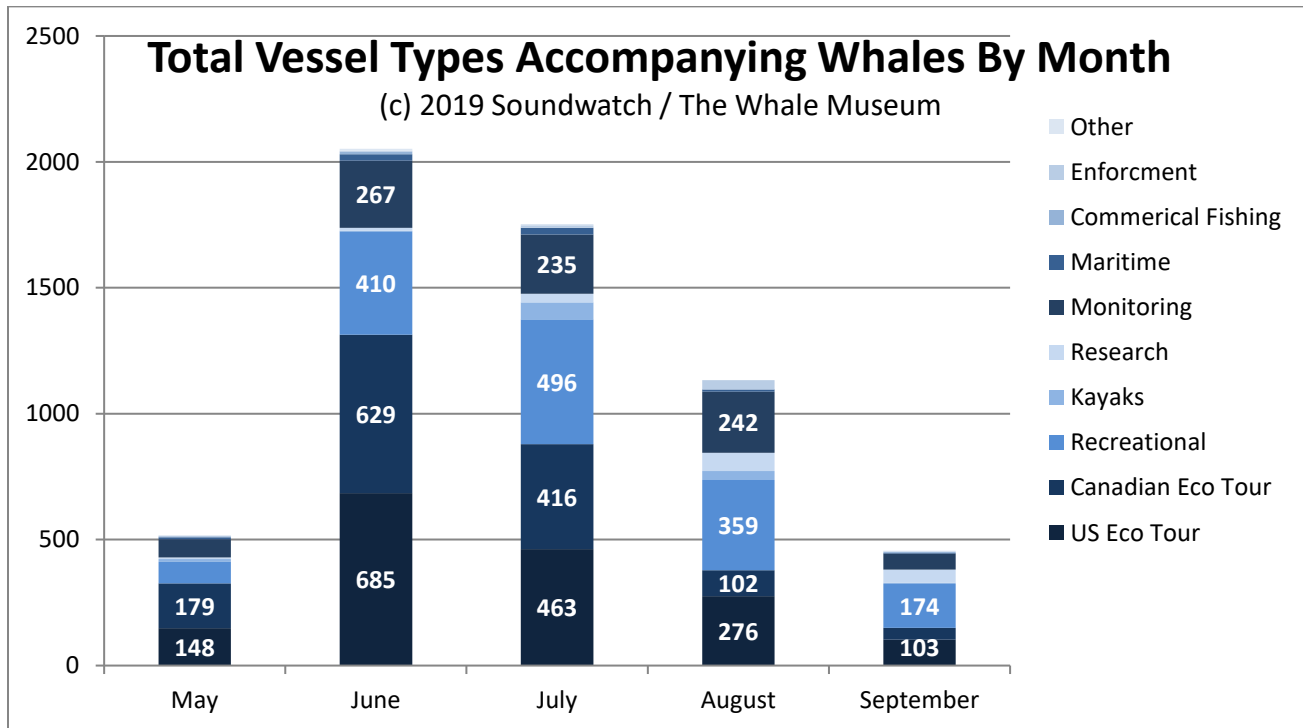


Figure 24: Total number of observed vessels by vessel type and month recorded in 2019.

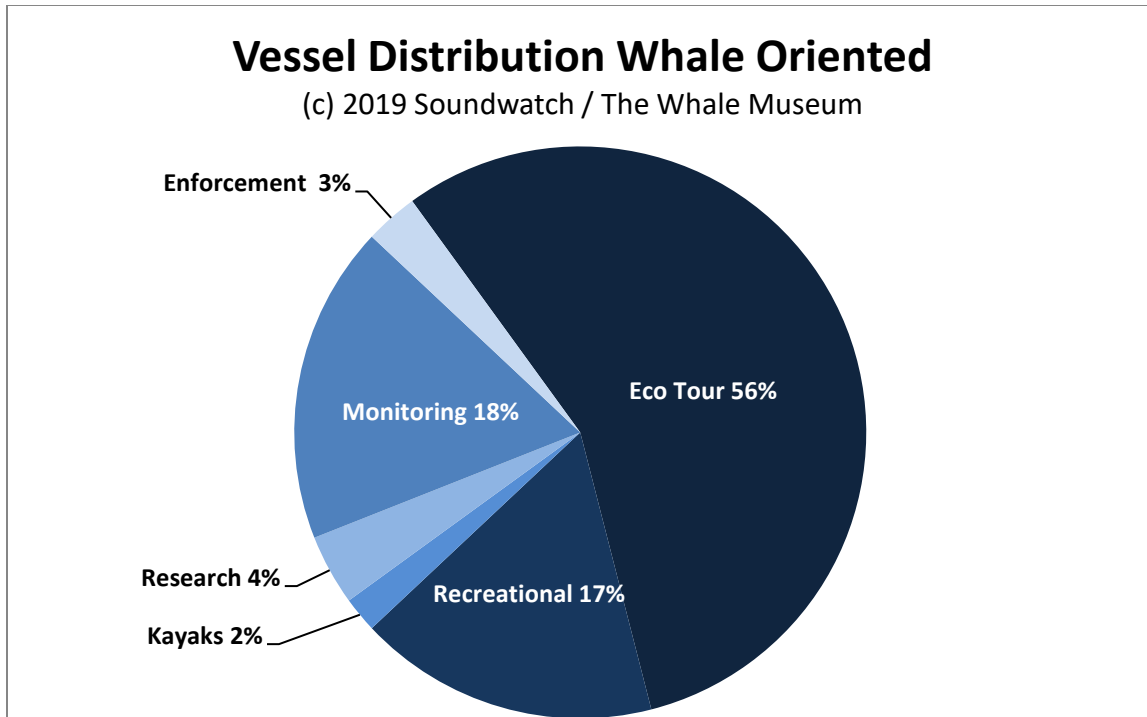


Figure 25: Percentage of vessel distribution by vessel categories and ‘whale oriented’. The ‘Other’ category includes aircraft and vessels not included within the other categories that became ‘whale oriented’.

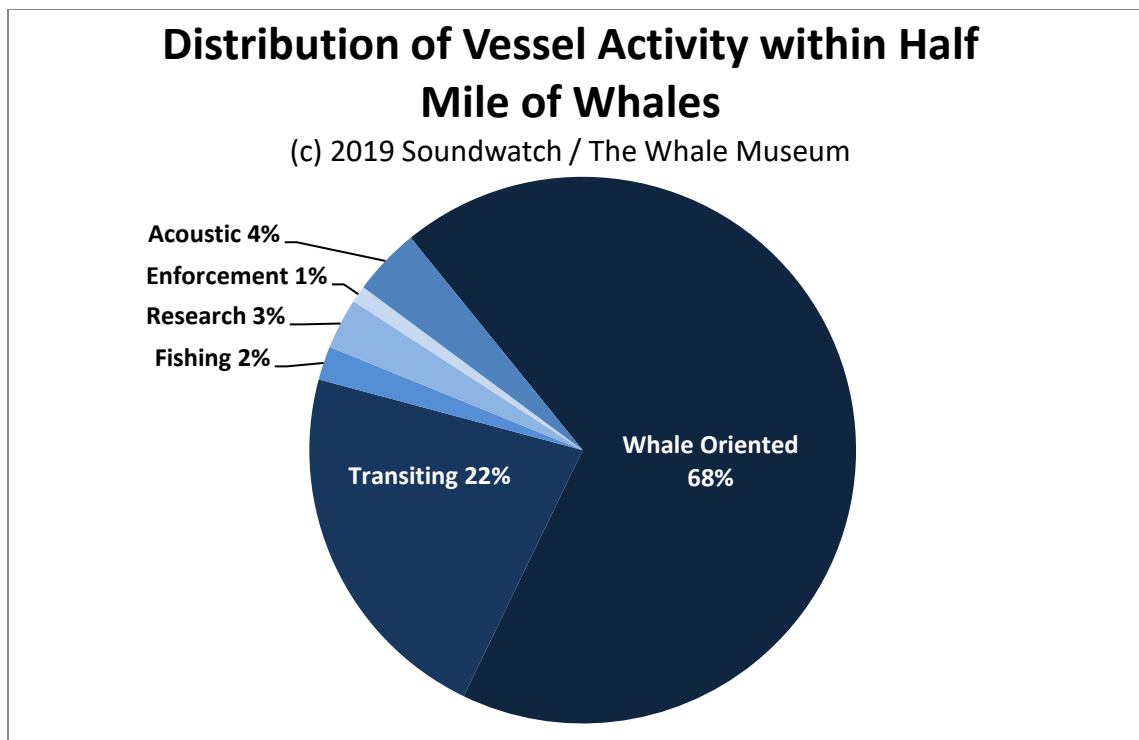


Figure 26: Distribution percentage of vessel activity within one half-mile of whales based on three-minute vessel counts by Soundwatch from May – September 2019.

Number of Vessels Accompanying Killer Whales

During May-September 2019, the average number of vessels observed within one half-mile of whales was 9.4, rounded down to the whole number 9, which is the lowest ever recorded by Soundwatch (Figure 27). The observed decrease in vessel traffic around whales since 2014 could be due to the heightened awareness of the plight of the SRKW population. In addition, in 2018 the PWWA updated their guidelines to limit the amount of viewing time to a maximum of 30 minutes in the vicinity of whales on days when there are more than 9 PWWA vessels within 1 km of that particular group of whales. In 2017-19, the average number of kayakers was lower than previous years likely due to fewer Soundwatch vessel counts/whale presence on west side of San Juan Island, Washington where a large number of kayaker’s tour (Figure 28). Whale watching activities, and vessels in general, had the highest average in July in 2019 of about 11 vessels within a half mile of whales and 8 of those vessels engaged in whale watching (Figure 29 & 30). Vessels engaged in whale watching activities (whale oriented) had a greater average than other vessel activities (Figure 30).

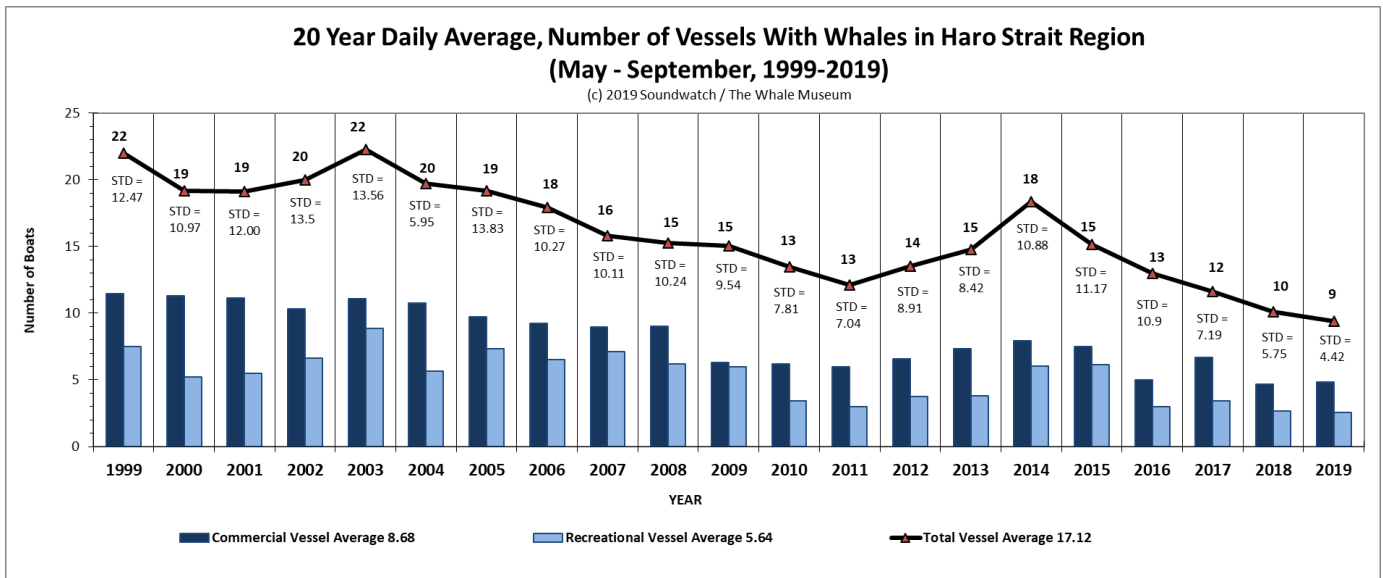


Figure 27: Average number (of recreational, EcoTour (commercial)) and a total of all vessels with killer whales in the last twenty years year in Haro Strait Region (May-September 1999-2016, 2018, 2019 and **June-September 2017)

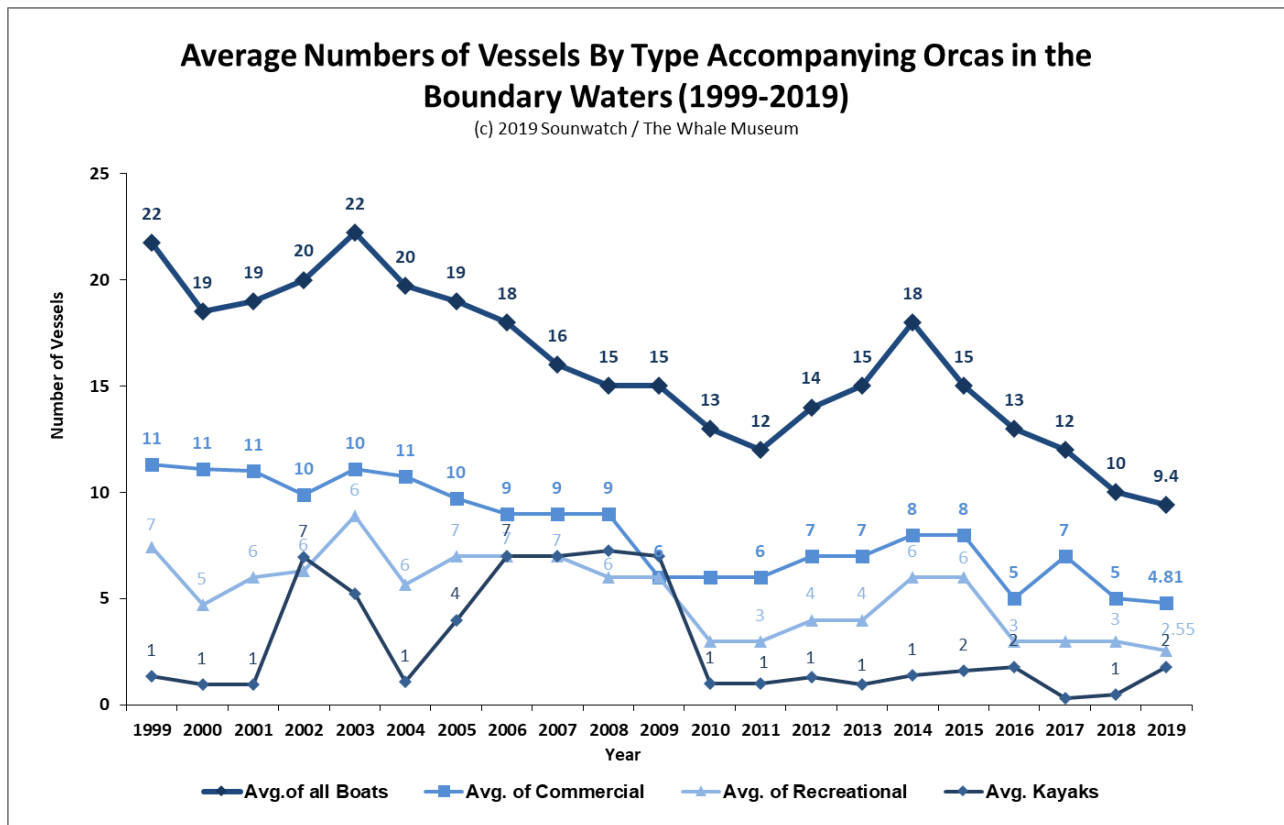


Figure 28: Average number of vessels by vessel category within one half-mile of killer whales

from 1999-2019 in the Salish Sea. Average numbers have decreased in each category since 2014, following whale dispersion throughout the Salish Sea.

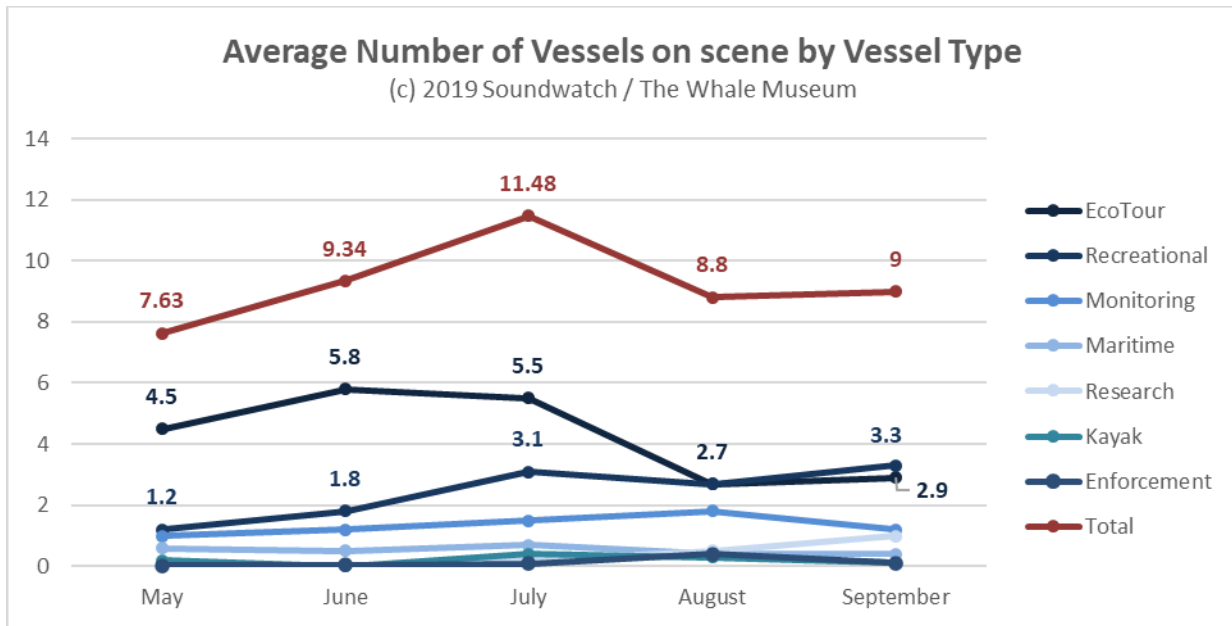


Figure 29: Average number of vessels within one half-mile radius of killer whale by vessel categories and month in 2019 Soundwatch vessel counts.

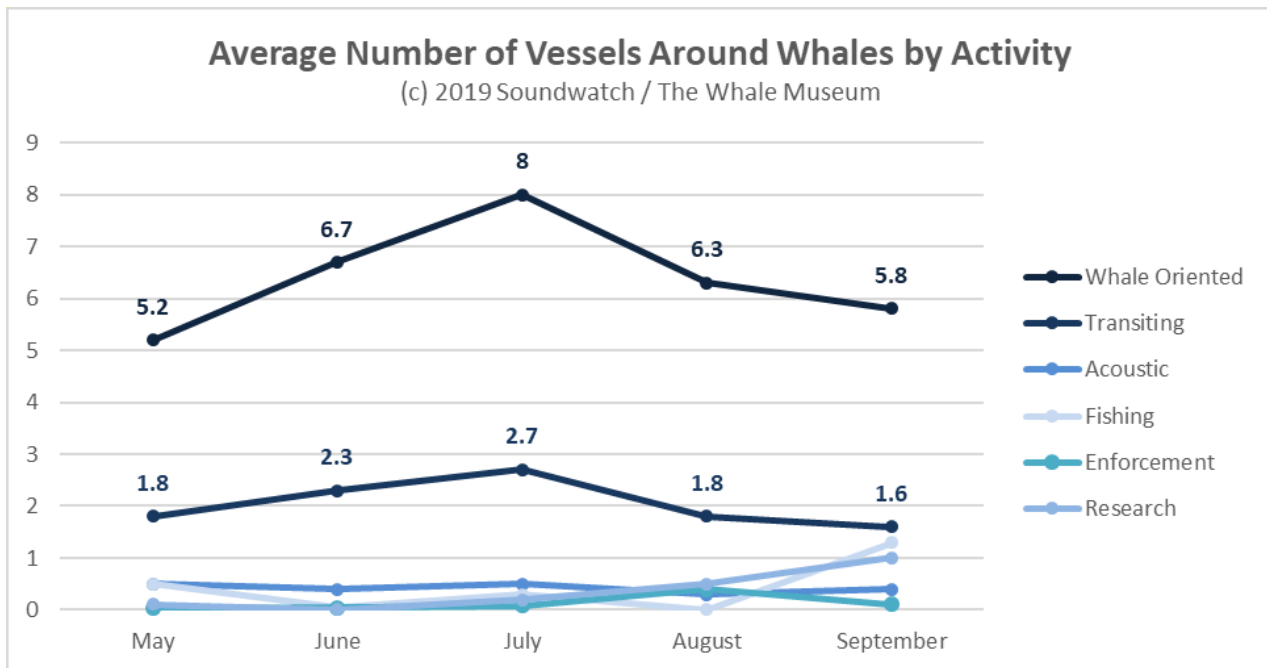


Figure 30: Average number of vessels within one half-mile radius of killer whales by vessel activity and month in Soundwatch 2019 vessel counts.

The 2019 annual maximum number of vessels observed with whales was 29. This is the lowest maximum number of vessels recorded by Soundwatch within a half mile of killer whales. This decrease in maximum vessels is believed to be attributed to the recent updates to the Pacific Whale Watchers Association (PWWA) guidelines, which limit the maximum number of commercial vessels around a single group of whales. This decrease could also be linked to increased dispersion by the whales, limited or closed fishing seasons, increased sightings of Transient killer whales, and heightened awareness of the plight of the SRKWs, as well as the agreement between the PWWA and Transport Canada to restrict viewing of SRKWs in the whales Critical Habitat in Canadian waters. However, the majority of maximum vessel counts occur on the west side of San Juan Island in Haro Strait near Eagle Point. This is a highly utilized and trafficked fishing area where recreational and commercial fishing vessels occupy the same space and time as killer whales. The maximum monthly number of EcoTour vessels in 2019 was 18 (Figure 31), which is the same as 2017's maximum of 18.

Variations in the maximum number of recreational vessels are dependent on three variables: 1) fishing season, 2) the presence of killer whales in popular fishing locations and 3) location of the Soundwatch vessel. From 2018 to 2019, data collected from May-September by Soundwatch indicates a decline in kayak presence (Figure 31 and 32) around killer whales. The appearance of a decline is likely related to the decline in killer whale days on the west side of San Juan Island, where a high percentage of kayakers launch from San Juan County Park. As well, the Whale Warning Flag was introduced to the area in 2018 by the San Juan County Marine Resources Committee; this will be discussed in greater detail in the Discussion section.

Not only is there variability in vessel averages and maximum by month and activity, but also by time of day. In 2019 (May-September), the 'peak times of day' was between 10:00 a.m. - 12:00 p.m. (Figure 33). Whale presence and EcoTour whale watch schedules contribute to monthly variation. The 2019 average shows a flattening trend over the 22-year mean with 'peak times of day' in the morning and mid-afternoon with a mid-day lull during trip turnaround times. This may be a reflection of EcoTour companies altering their departure times to decrease the number of vessels on scene with killer whales, or altering their schedules to adjust for sunset trips. It was noted by Soundwatch during extended hours of operations that there may be an increase in vessel traffic accompanying whales at dusk that has been unable to be observed by Soundwatch in recent years due to lack of funding. Soundwatch recently was awarded the National Fish and Wildlife Foundation's Killer Whale Conservation Grant in which resources will be allocated to extend Soundwatch operations into later hours of the day to fill this data gap. Adjustments to data protocol or operations will be outlined in the Discussion section at the end of this report.

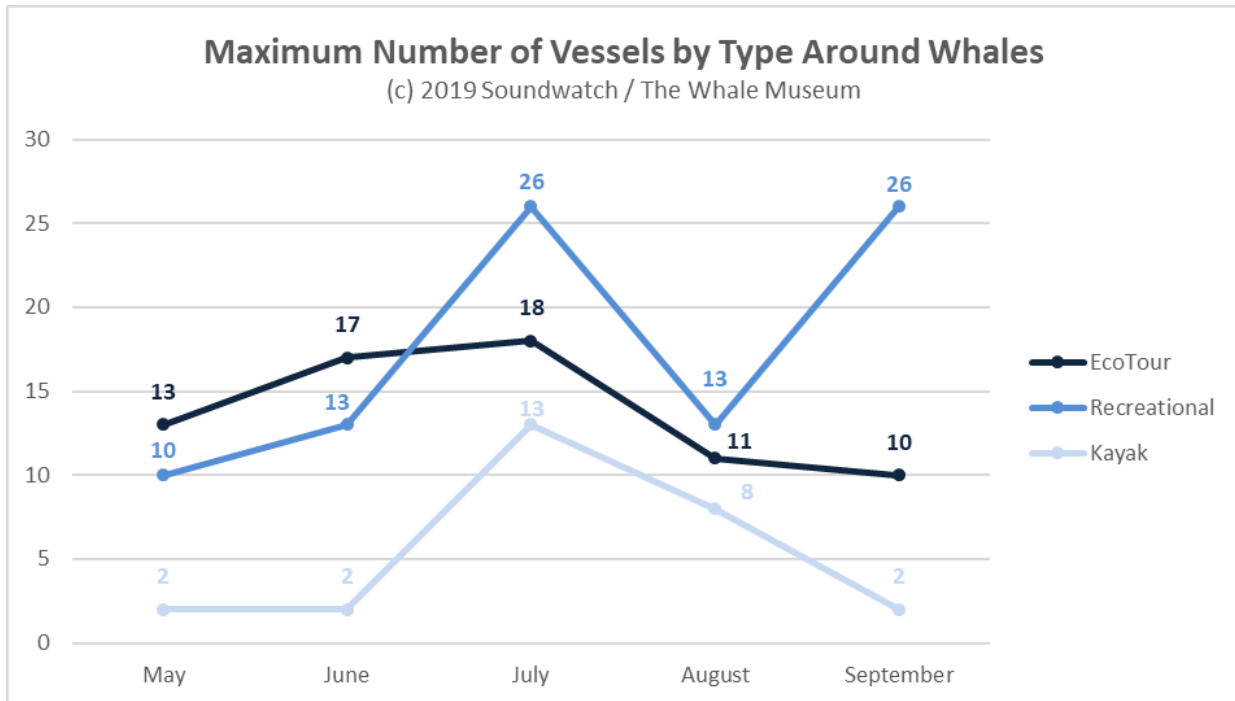


Figure 31: Maximum number of vessels by category and month around killer whales from May-September 2019.

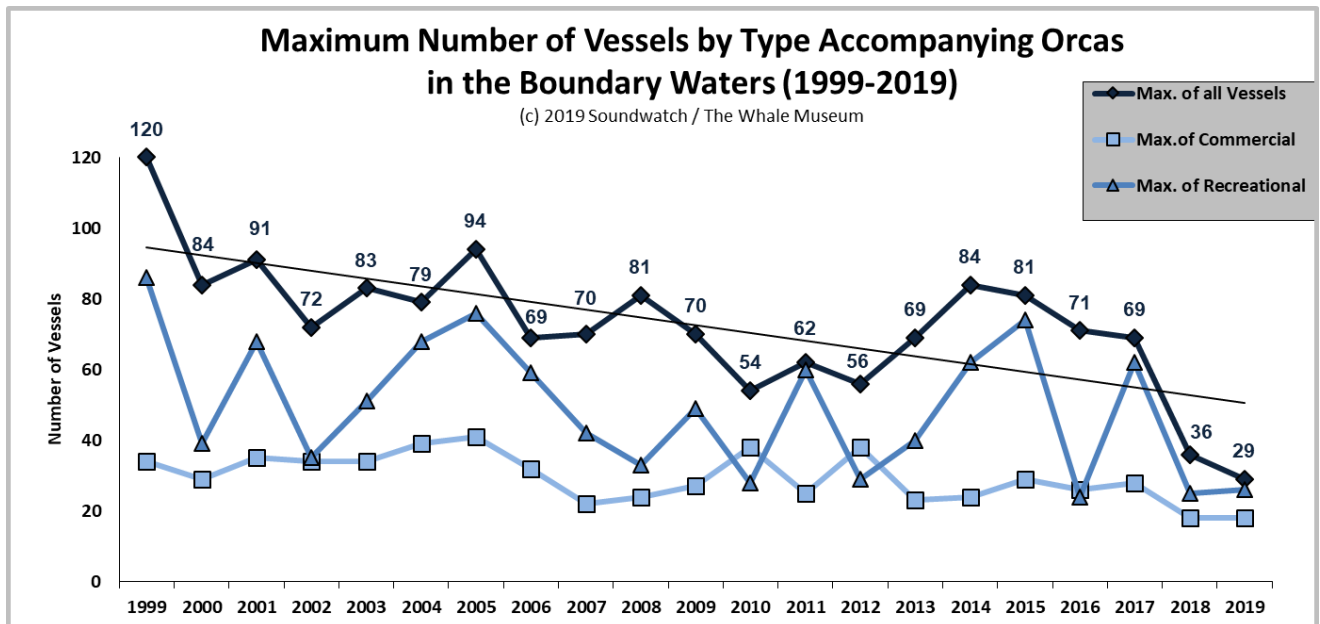


Figure 32: Maximum number of vessels within one half-mile of killer whales in the Salish Sea by vessel category from 1999-2019.

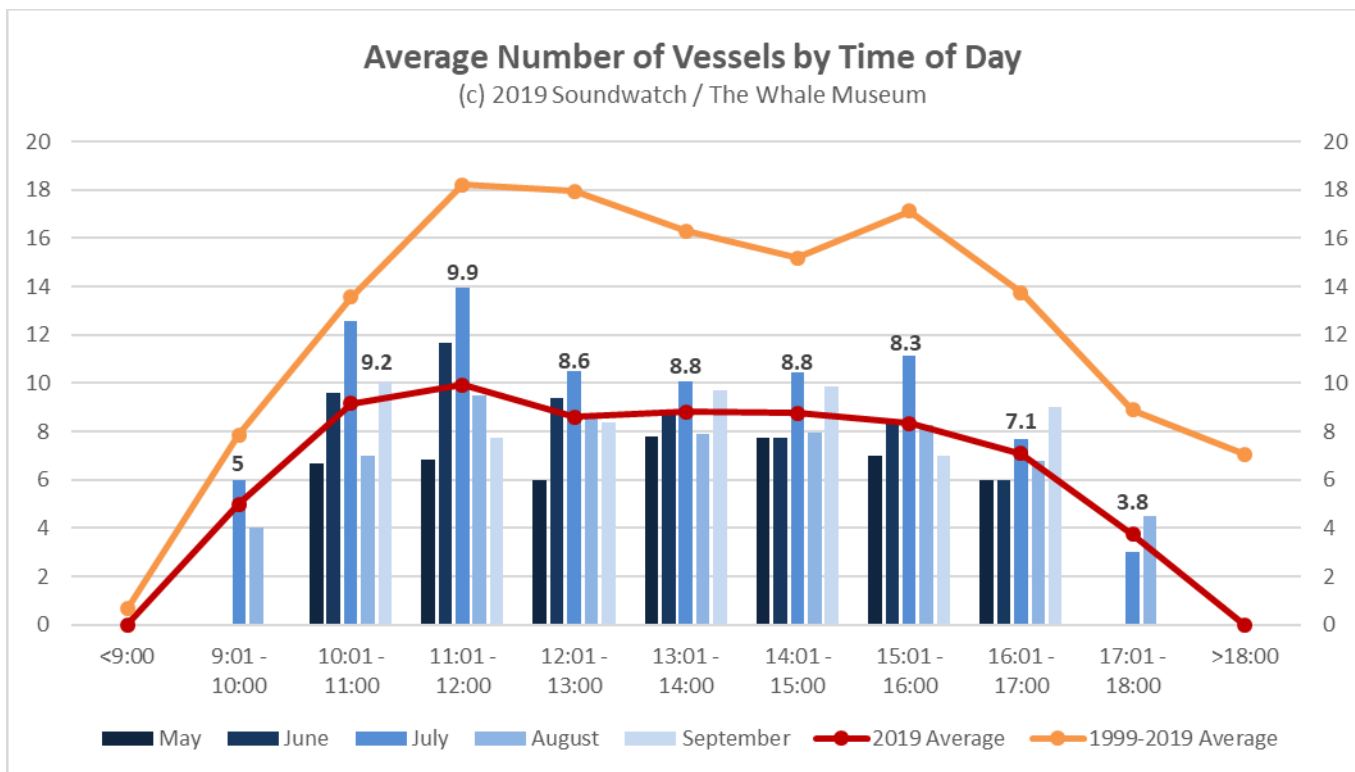


Figure 33: Average number of vessels by time of day includes all vessel categories, the average for 2019 and the 20-year average.

Compliance with Regulations and Guidelines

Soundwatch *Vessel incident* data can be utilized to characterize types of vessels, types of vessel incidents, and geographic locations where vessel incidents are most commonly observed. The incident data can be used to generate future strategies for commercial and recreational whale watching and targeted outreach efforts. With U.S. Federal and Washington State vessel regulations (established in 2011 and updated in 2019, respectively), current and long-term Soundwatch vessel incident trend observations lay the foundation for evaluating the effectiveness of the vessel regulations and regional *Be Whale Wise* guidelines (Ferrara, *et al* 2017).

Soundwatch monitors commercial (EcoTour) whale watch operators, private recreational boaters, and other vessel operators, and records behaviors that are inconsistent with current best practice guidelines and/or vessel regulations as a *vessel incident*. A *vessel incident* is specifically defined as a driver of an EcoTour vessel, recreational boat operator, kayaker or other vessel operating contrary to current voluntary *Be Whale Wise Guidelines*, the *Kayakers Code of Conduct*, the San Juan Marine Stewardship Area (including close proximity to National Wildlife Refuges, Voluntary No-Go Zones, etc.), the PWWA Commercial Whale Watch Guidelines and/or federal and state vessel regulations. Only trained Soundwatch staff driver/educators make the determination of an observation of a potential *vessel incident*.

A set of standardized *incident descriptions* was established in 2007 and updated in 2019 to include the vessel regulations (Appendices J1 & J2). This standardized set of definitions is used by the U.S. and Canadian federal governments, Straitwatch of British Columbia, and Soundwatch of Washington State. In the same fashion that the vessel type and vessel activity categories for the vessel counts were designed to be multi-tiered, the vessel incident categories are tiered broad to specific and are recorded as vessel incidents at a fine scale. For analysis, they are sometimes lumped into the broad incident categories, but also can be looked at more closely to better understand the incident type. Some older incident terms are used in this report when discussing vessel types and vessel incidents because they are more commonly used outside of the monitoring and enforcement programs.

Vessel Incident Trends

Soundwatch uses summary statistics to analyze annual vessel incident data. Since its inception in 1993, Soundwatch has used an adaptive management approach (i.e., changing guidelines annually to meet changing vessel/whale conditions), and there have been many shifts in the types and numbers of vessel incident categories over the years. This makes comparing overall vessel incident numbers from year to year somewhat difficult. While annual Soundwatch vessel incident summaries (Table 34) are useful tools to evaluate vessel trends, especially with the implementation of vessel regulations, some diligence is needed to accurately interpret the year-to-year changes. Soundwatch began collecting vessel behavior data in 1998, shortly after the development of the initial Be Whale Wise guidelines. The federal regulations were developed out of those guidelines in 2011, codifying the previously voluntary prohibition on parking in the path of the whales within 400 yards and increasing the voluntary approach limit from 100 yards to a mandatory limit of 200 yards. Consequently, the number of incidents of vessels close to the whales increased in 2011, when those vessels between 100 and 200 yards were first included in those counts. The regulatory environment changed again in 2019 when Washington State updated its vessel regulations, through Governor Inslee's Orca Recovery Task Force, by expanding approach distances to Southern Resident killer whale to 300 yards on the side and 400 yards in the path and behind the whales, further increasing the recorded number of incidents of vessels in close proximity to the whales compared to previous years. However, Washington's regulations only apply to Southern Residents, not transients, as with the federal regulations. Washington State also began requiring that vessel remain under 7 knots within a half mile of SRKW in 2019. In 2019, over 7 knots within a half mile of SRKWs was the most frequent vessel incident recorded.

To further complicate matters, it is difficult to measure the true effectiveness of guidelines and regulatory measures when they were not consistent on both sides of the U.S./Canadian border (transboundary) prior to July 2018 when Canada updated their federal guidelines to coincide with the United States. In 2019, vessels in Canadian waters were governed by an interim order restricting approach distance to 400 meters of all killer whales, approximately 100 meters further than the requirement alongside the whales in WA State. Commercial whale watch operators, however, signed an agreement with the Canadian government allowing them to approach Transient killer whales to 200 meters and not viewing SRKWs. Additionally, the WDFW, San Juan County, PWWA, and NOAA recognized and promoted a voluntary No-Go-Zone on the west side of San Juan Island from Mitchell Point to Cattle Point extending a quarter of a mile

from shore and a half mile from the lighthouse at Lime Kiln State Park. This extended the previous voluntary No-Go-Zone from Eagle Point to Cattle Point starting in 2018, which includes more of the popular fishing grounds near Eagle Point. As a result, in 2018 there were more vessels operating within this expanded No-Go-Zone than in previous years and this may have driven the higher percent of incidents of vessels within the zone. However, in 2019 with limited recreational salmon fishing openings, greater zone awareness and reduced presence of the SRKWs, vessels operating within the no-go-zone was lower than 2018 at 1% of all recorded incidents in 2019. All of the incidents recorded in the “Other” category were vessels fishing within 300 yards and 200 yards of whales.

There are obvious overlapping trends of whale use and boating activities within a one half-mile of whales including whale watching, fishing, and transiting. The areas with the most vessel incidents observed by Soundwatch in 2019, were within one half-mile near shore along the west side of San Juan Island (Zone 1 and 2), San Juan Channel (Zone 4), Spieden Channel (Zone 5), and Boundary Pass (Zone 13) (Figure 36-37). The increase of observed incidents in Spieden Channel and Rosario Strait is most likely due to the observed increase in Transient killer whales in those locations.

Behavior Category	Yearly Incident Percentages																						
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
None Categories Not Used During All Years																							
Lea Progrepping	37%	31%	23%	1%																			
Under power within 0-100 yards of whales	6%	4%	5%	4%	5%	12%	9%	10%	12%	15%	12%	13%	12%	8%	4%	10%	9%	7%	9%	9%	2%	5%	
Stopped within 0-100 yards of whales														17%	8%	7%	13%	11%	12%	10%	2%	1%	
Under power within 100-200 yards of whales														12%	10%	15%	12%	8%	14%	16%	9%	9%	
Stopped within 100-200 yards of whales														18%	15%	6%	14%	13%	15%	14%	7%	1%	
Within SJI No-Go-Zone	39%	26%	17%	17%	7%	13%	4%	8%	4%	5%	6%	8%	10%	6%	6%	2%	0%	2%	2%	<1%	15%	7%	
Within 880 yards of Lime Kiln	2%	2%	2%	1%	2%	5%	1%	2%	1%	3%	4%	3%	4%	1%	2%	1%	1%	2%	<1%	<1%	<1%	0%	
Crossing path of whales	4%	3%	5%	2%	4%	7%	6%	4%	5%	8%	4%	5%	5%	2%	7%	10%	8%	3%	0%	0%	<1%	0%	
Chasing/pursuing whales	3%	1%	3%	2%	<1%	4%	3%	1%	2%	3%	3%	3%	3%	1%	<1%	<1%	0%	0%	0%	0%	4%	2%	
Inshore of whales	5%	29%	24%	25%	19%	16%	22%	18%	17%	16%	21%	24%	17%	13%	10%	10%	9%	9%	4%	3%	<1%	7%	
Airplane within 1000 feet	4%	2%	4%	7%	14%	6%	6%	4%	6%	8%	8%	6%	4%	3%	<1%	8%	2%	2%	<1%	1%	<1%	<1%	
Within 200 yards of National Wildlife Refuge	0%	1%	3%	1%	2%	2%	1%	0%	<1%	1%	1%	<1%	1%	0%	1%	<1%	0%	0%	0%	0%	3%	1%	
Other	1%	1%	3%	3%	14%	5%	15%	11%	10%	3%	2%	1%	1%	0%	1%	1%	0%	0%	0%	0%	13%	3%	
Within 220 yards of shore; whales present			4%	4%	2%	<1%	4%	1%	2%	2%	<1%	<1%	1%	1%	2%	1%	0%	0%	<1%	1%	<1%	0%	
Repositioning within 100 yards in the path (formerly Parked in the path of whales)			7%																				
Past within 1/2 mile				26%	24%	17%	19%	27%	26%	17%	25%	19%	23%	11%	16%	18%	17%	26%	23%	23%	21%	12%	
1st Approach head on, behind, or on shore				3%	3%	4%	9%	10%	11%	16%	13%	13%	6%	9%	8%	9%	8%	11%	6%	6%	7%	35%	
Kayaks spread out																							
Kayaks with whales outside 1/4 SJI Zone																							
Kayaks paddling w/in 100-200 Yds																							
Kayaks paddling on headland																							
Within 300 yards of SRKWs (Washington 2019)																							
Within 400 yards of Miller whales (Canada Interim order 2019)																							
Total %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Total Observed Incidents	398	791	653	553	259	378	761	957	1,281	1,085	1,419	2,572	1,067	2,500	2,621	2,234	2,509	1,635	1,847	2,257	1,117	749	
Estimated Annual Observation Hours	426hr	510hr	462hr	486hr	378hr	312hr	486hr	564hr	516hr	420hr	540hr	420hr	442hr	573hr	306hr	331hr	425hr	393hr	451hr	689hr	547hr	290hr	

Table 34: Summary of vessel incidents as defined by *Be Whale Wise* Guidelines and federal/state vessel guidelines in U.S. and Washington State from 1998-2019.

Incident Type	PA	CA	EC	EK	EU	GW	MF	MM	PK	PM	PS	R	Total
100 yards under power			2		6		1			22	5		36
200 yards under power			6		6		1		3	42	8		66
300 yards under power (SRKW WA)				10	4		1		1	52	10		78
400 yards under power (T CAN)										10	1		11
400 yards in the path			9	10	7		1		1	54	11		93
inshore of whales			3	10	7		2		2	30			54
drone violation										3			3
fast approach within 400 yards					1					8	3		12
fast departure within 400 yards			3		1					15	1		20
over 7 kts within half mile of whales			8		6		7	3		195	2		221
fishing within 100 yards										10			10
fishing within 200 yards							2			25			27
paddling within 100 yards of whales				13					7				20
shutdown within 100 yards			1							2	1		4
shutdown within 200 yards			2	1						3			6
SJI No-Go-Zone			1	3	3					46	1		54
spread out kayaks with whales				7									7
traveling behind whales 100-400 yards			1							12	4		17
within eighth mile of shore										1			1
within half mile of Lime Kiln Lighthouse			1							6			7
within 200 yards of a Wildlife Refuge			1							1			2
Total	0	0	37	54	41	0	15	3	14	537	47	0	749

Figure 35: Summary of vessel incidents in 2019 by incident type and vessel involved in the incident. (PA=Private Aircraft, CA=Commercial Aircraft, EC=Eco Tour Canada, EU=Eco Tour U.S., EK=Eco Tour Kayak, GW=WDFW, MF=Commercial Fishing, MM=Monitoring, PK=Private Kayak, PM=Private Motor, PS=Private Sail, R=Research)

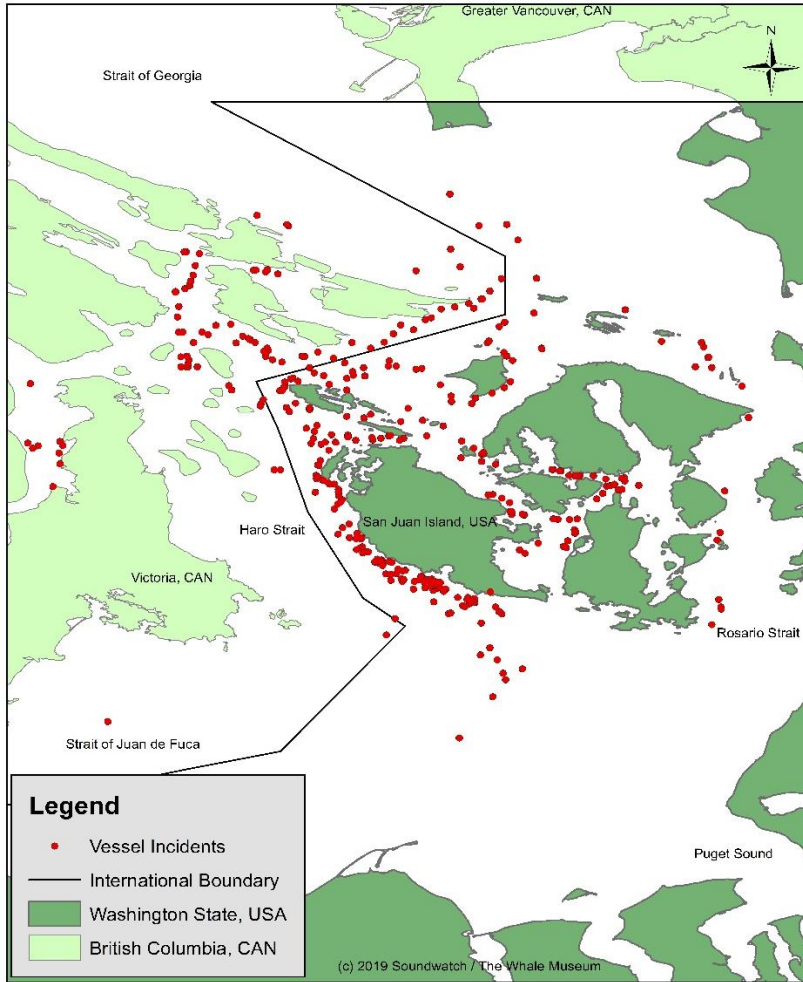


Figure 36: Total vessel incident locations observed by Soundwatch from May – September 2019. Points can be multiple incidents, $N=749$ incidents.

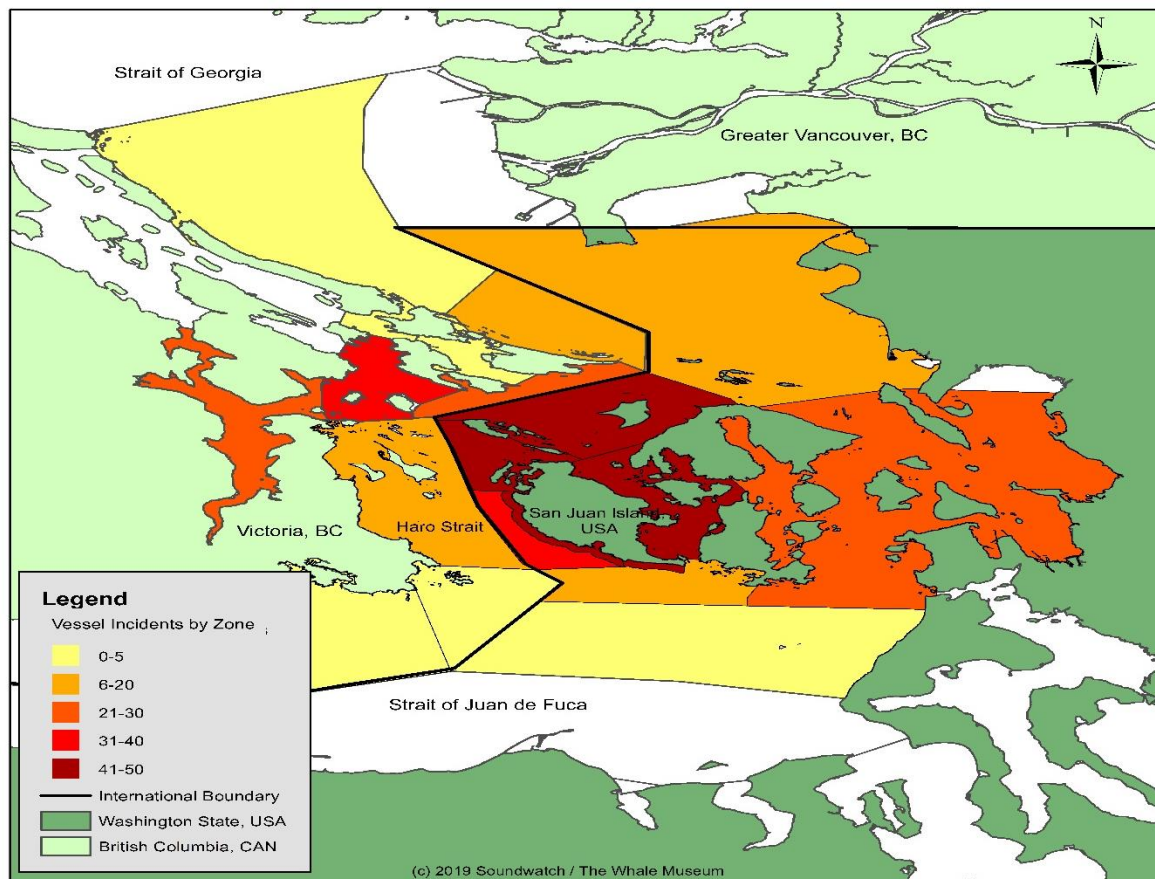


Figure 37: Vessel incidents by zones, with lighter colors having fewer total incidents than zones in darker colors. Locations can be multiple incidents, $N=749$ incidents.

In 2019, there were a total of 749 vessel incidents observed and recorded by Soundwatch staff. Of the incidents recorded 35% were U.S. Vessel Regulation violations; **Vessels Within 200 Yards of Whales** were 23% and **In the Path of Whales** were 12%. The greatest number of incidents recorded was under the new Washington State Law of **Under 7 knots within a half mile of SRKWs** at 30% (Figure 39).

In 2019, **Vessels within 200 Yards of Whales** incidents (23% of all incidents) were broken down by; Vessels Stopped within 0-100 yards (<1%) Vessels Stopped 100-200 Yards (1%) Vessels Under Power Within 100 Yards (5%) were made by 75% recreational vessels, 5% Canadian commercial vessels, 17% U.S. commercial vessels and 3% commercial fishing vessels. Vessels Under Power Within 200 Yards (9%) were made by 80% recreational vessels, 9% Canadian commercial vessels, 9% U.S. commercial vessels, and 2% commercial fishing vessels. Fishing Within 100 Yards (1%) were made by 100% recreational vessels. Fishing Within 200 Yards (44%) were made by 1% commercial fishing vessels and 99% recreational vessels. Under Power Following Whales Within 400 Yards (2%) were made by 94% recreational vessels, and 6% Canadian commercial vessels. **In the Path of Whales** incidents (12% of all incidents) were made by 71% recreational vessels, 10% Canadian commercial vessels, 8% U.S. commercial vessels, 11% commercial kayaks, and 1% commercial fishing vessels. **Under 7 knots within a half mile of whales** incidents (30% of all incidents) were committed by recreational vessels

(89%), Canadian commercial vessels (4%), U.S. commercial vessels (3%), commercial fishing vessels (3%), and enforcement vessels (1%).

In 2019, 72% of all incidents were committed by private/recreational motor vessels, 6% private sailing vessels, 7% commercial kayaks and 2% private kayaks, 5% Canadian commercial vessels, 5% U.S. commercial vessels (10% EcoTour) and 2% by commercial fishing vessels. (Figure 40). The changes in ratios of incidents committed by recreational vessels and commercial vessels, and the lower overall number of incidents recorded by Soundwatch, can be attributed to the unique season and heightened awareness and concern over the Southern Resident killer whales. Another contributing factor to reduced incidents by commercial vessels could be the PWWA updated industry guidelines and pressure from the public in light of heightened awareness of the plight of the Southern Residents.

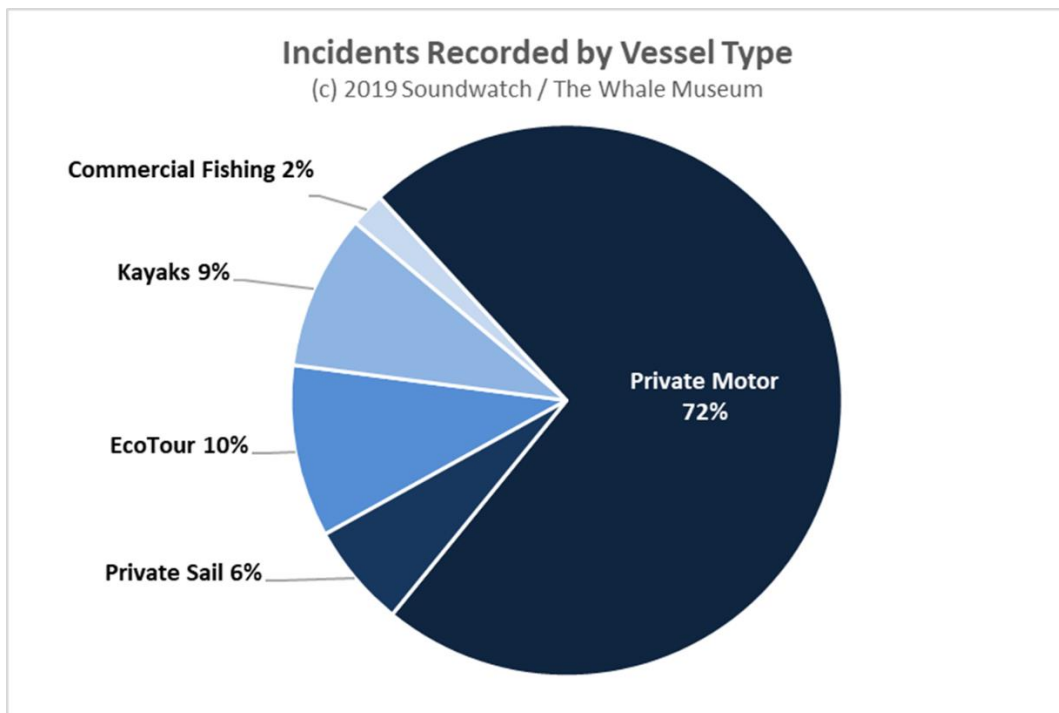


Figure 40: Percentage of all vessel incidents ($N=749$) recorded by Soundwatch from May – September 2019 by vessel type.

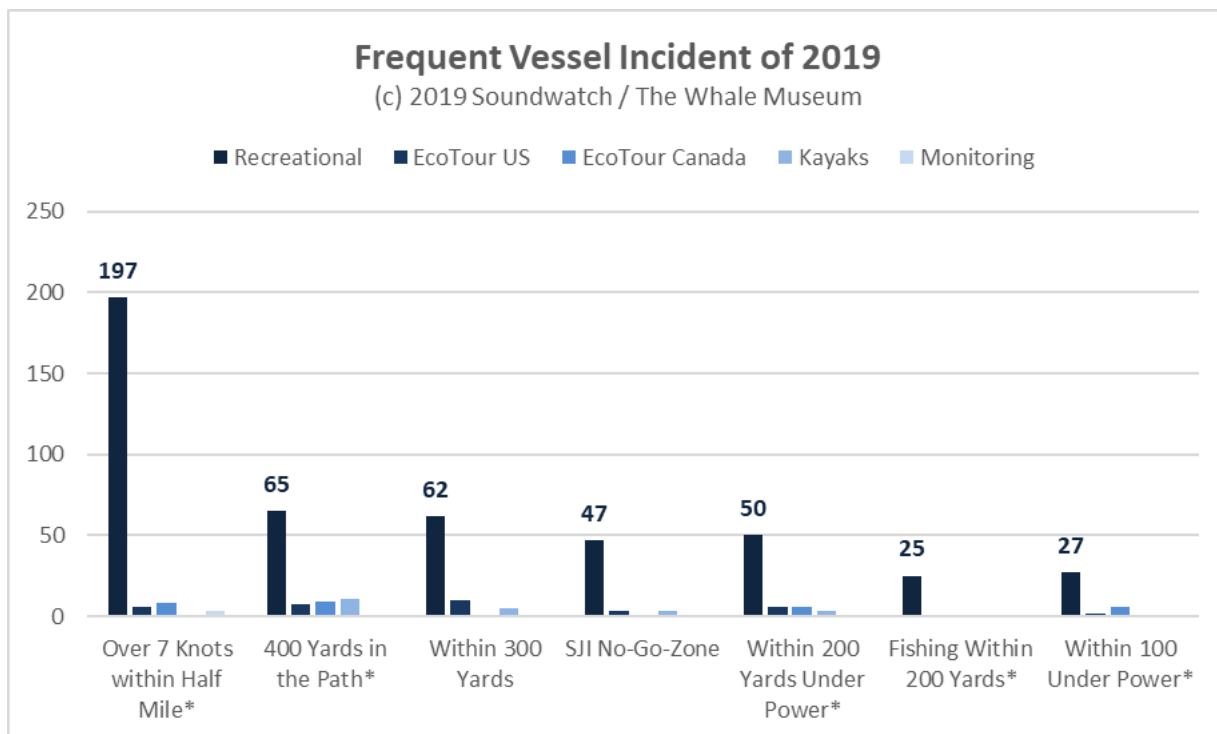


Figure 39: Most frequent vessel incidents observed by Soundwatch from May – September 2019 by incident and vessel categories. *Indicates Federal/State Vessel Regulations.

Private recreational vessels ranked the highest number of incidents in all of the frequent incident categories when comparing vessel categories. Canadian EcoTour and US EcoTour vessels tied for the second highest number of incidents in Federal/State vessel regulations: **Stopped within 100 yards** (22%) and **200 yards** (18%) of killer whales, second highest in **In the Path** (17%), **200 yards under power** (7%), and **100 yards under power** (25%) of whales.

Whale watching activities (‘whale oriented’) accounted for 30% of vessel incidents when comparing vessel activities, while vessels transiting recorded more incidents (57%) around whales (Figures 41 and 42). Increased vessel incidents by transiting vessels is likely due to Washington State updating vessel regulations in 2019 to include a speed limit of under 7 knots within a half mile of SRKWs. It can be seen in the data that whale oriented vessels still committed violations, such as **Under power within 200 yards** and **High Speed within 400 yards**, within known presence of whales. These incidents are hypothesized to create the most disturbance and risk, such as vessel strike, to whales.

Variations in maximum vessel numbers and average vessels on scene are likely due to annual variation in whale presence, social cohesion, and awareness. These factors can reduce the number of incidents recorded by Soundwatch. Soundwatch operations are limited by time, resources, weather, and other research or education activities on-the-water. Therefore, incident numbers recorded by Soundwatch are not a full representation of the whale watching scene on the water over the course of the season, and fewer recorded incidents does not necessarily mean improved boater behavior. Even though there are variations in the vessel numbers, many of the incident percentages are the same as previous years (Figures 43 and 44). From 2018 - 2019, an

overall decrease in incidents was recorded, which is likely due to lower observational hours due to reduced presence of the SRKWs.

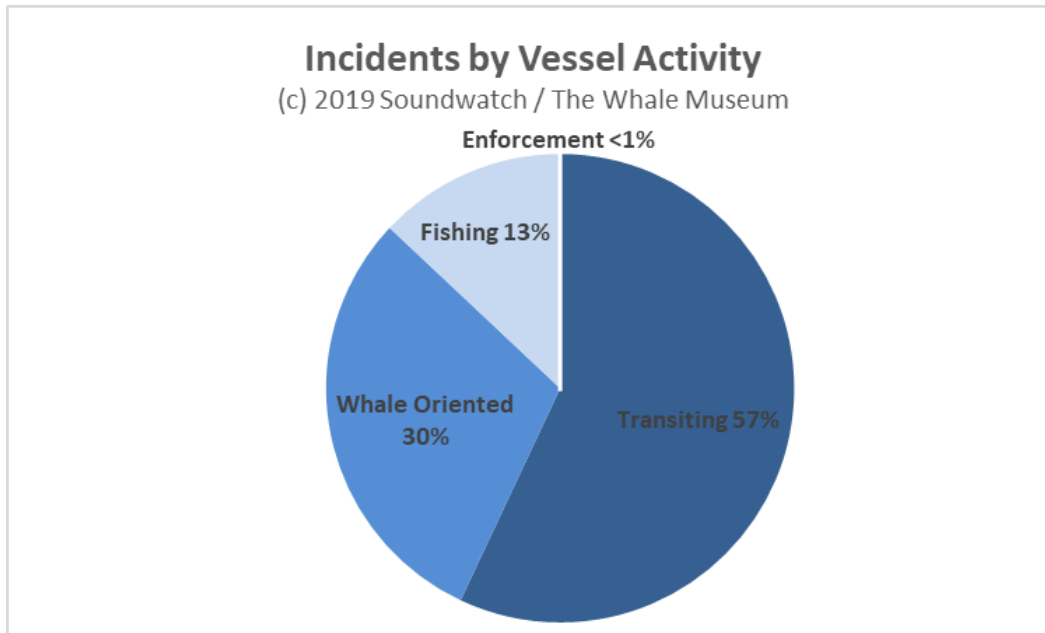


Figure 41: Percentage of all vessel incidents by vessel activity observed by Soundwatch May-September 2019.

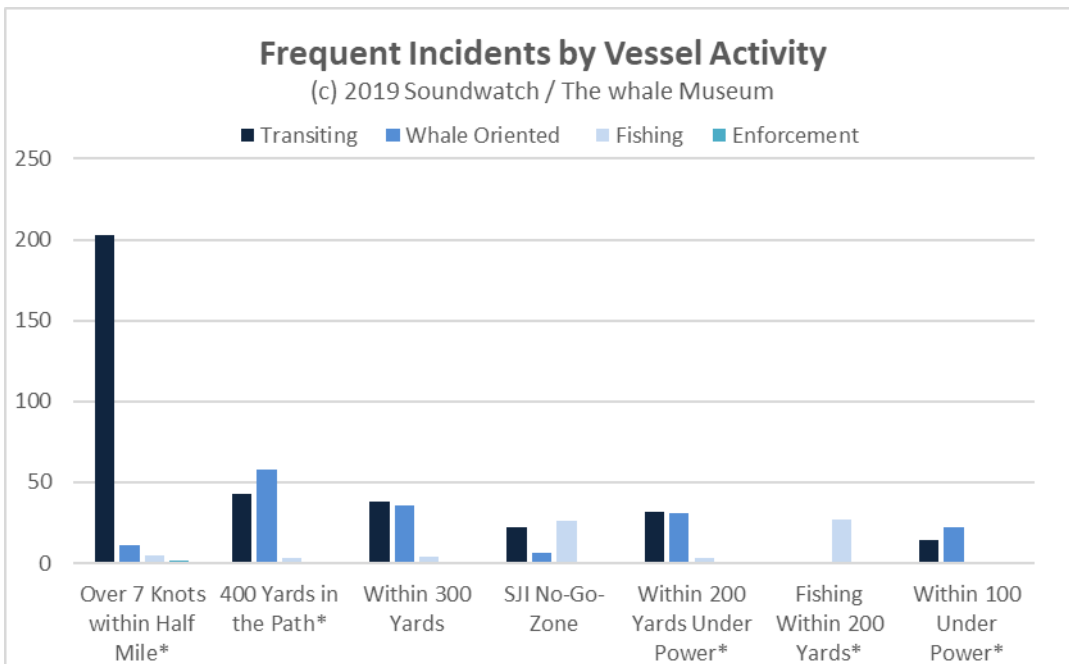


Figure 42: Most frequent vessel incidents observed by Soundwatch from May – September 2019 by incident and vessel activity. *Indicates Federal/State Vessel Regulations.

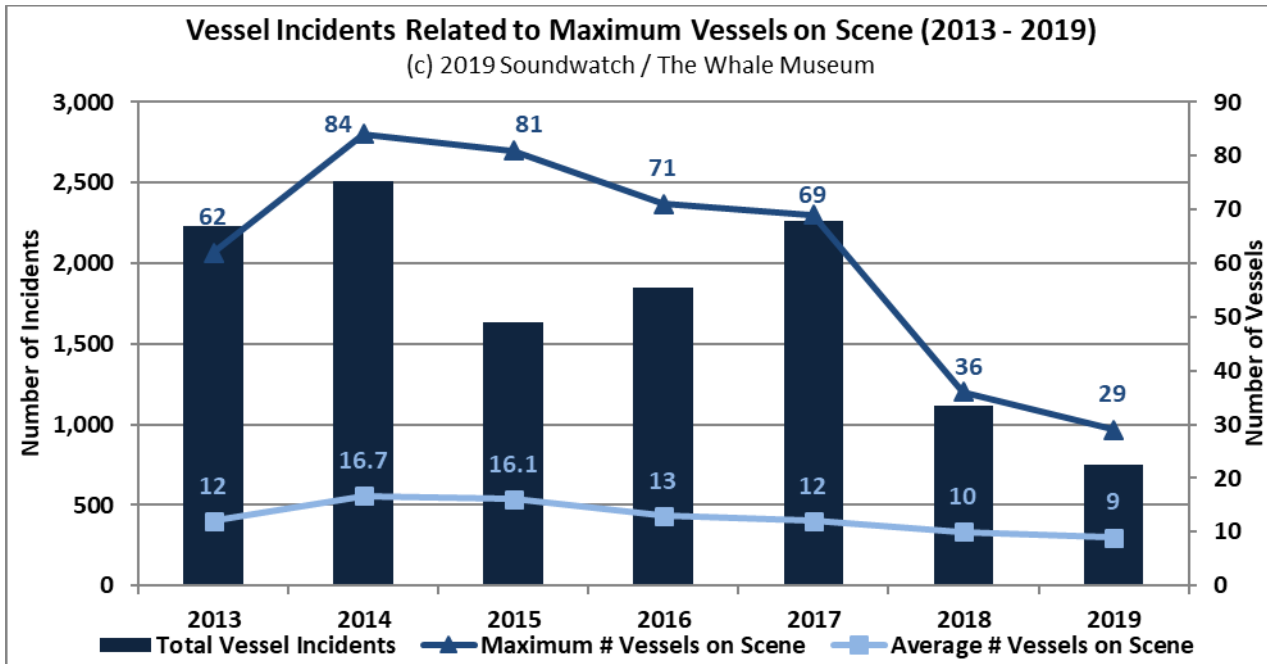


Figure 43: Average, Maximum, and Total number of vessels on scene with killer whales plotted with number of vessel incidents from May-September 2013-2019 observed in the Salish Sea by Soundwatch.

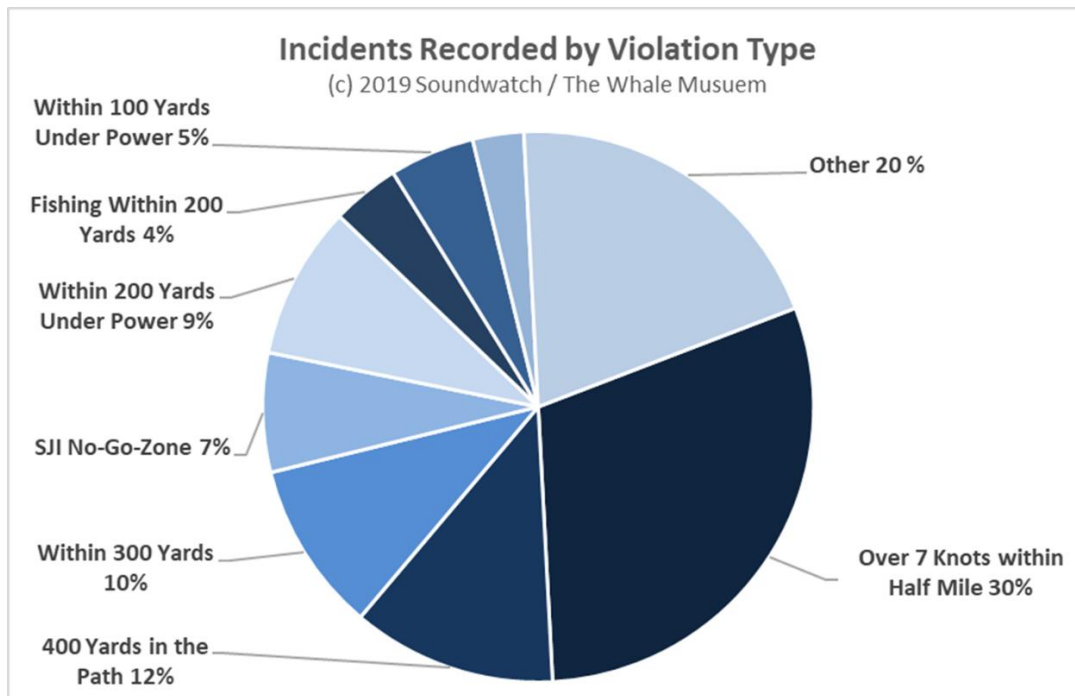


Figure 44: Percentage of all incidents in 2019.

Vessel Type Incident Rates

In 2019, data was recorded by Soundwatch for 289.9 hours and 648 vessel counts. Therefore, the overall 2019 incident rate is: $2 \times 749/648$ resulting in an annual number of 2.3 total incidents per hour (Figure 46-48). Incident rates per hour were calculated for only the top three vessel categories, Recreational, Canadian EcoTour, and U.S. EcoTour vessels. To determine vessel incident rates per vessel type: $2 \times$ the annual number of incidents per vessel category were divided by the annual number of 30 minute vessel counts in which those vessel types were recorded. Recreational incident rates significantly higher than the EcoTour rates (Figure 45).

U.S. Federal and Washington State vessel regulations incidents are 200-400 yards in the path of killer whales, less than 200 yards shutdown or under power near killer whales, and over 7 knots within a half mile of SRKWs within Washington State Inland waters. In 2019, less than 400 meters shutdown or under power was an incident with respect to Canadian regulations (except for PWWA vessels with signed agreements). In addition to the regulations, additional incident categories are based on the *Be Whale Wise Guidelines*, KERP, and the No-Go Zone. *Be Whale Wise Guidelines* are used in all locations of the Salish Sea, where monitoring is conducted unless otherwise noted.

Over the past thirteen years 2006-2019, recreational vessels remain the most likely vessel type to commit all incidents. Incident rates by hour in 2019 were as follows: Private recreational vessels had a high incident rate of 2.12, U.S. EcoTour vessels 0.13, Canadian EcoTour vessels 0.12, EcoTour Kayaks 0.31, and all other vessel types were less than 0.1 incident per unit of time in 2019 (Figure 47). EcoTour Kayaks typically operate on the west side of San Juan Island within the voluntary no-go-zone. This is the area in which kayakers are most likely to come across killer whales, particularly SRKWs. With reduced presence of the SRKWs we saw a reduced presence of kayakers in our observations, but an increase in incident rates. This is most likely due to private kayakers or multi-day commercial kayak trips interacting with Transient killer whales in area they are not expecting to see whales. Private recreational vessel incident rates increased throughout the season, which may be linked to fishing activities. Presence of SRKWs increased in the month of September in close proximity to sport fishing areas compared to other months, which could also contribute to the increased incident rate.

Over 7 knots with a half mile had the highest rate of incidents at 0.68. **In the Path** incidents had the second highest incident rate of nearly 0.29 incidents per hour, followed by **300 yards under power and shutdown** at approximately 0.21 incidents per hour. The higher incident rate in **less than 200 yards of whales** incident category may be attributed to operators staying in close proximity to the whales, shutting down their engines versus attempting to remain at a greater distance by engaging their engines. Soundwatch noted EcoTour operators announcing over VHF radio they were shutting down their engines when killer whales were less than 200 yards from their vessel in efforts to reduce engine noise (Figures 48-51). This occurs when whales change direction, possibly associated with foraging, and vessels do not have appropriate time or distance to react. Announcing over the radio is probably for the benefit of Soundwatch and law enforcement displaying the vessel operator is aware of the situation.

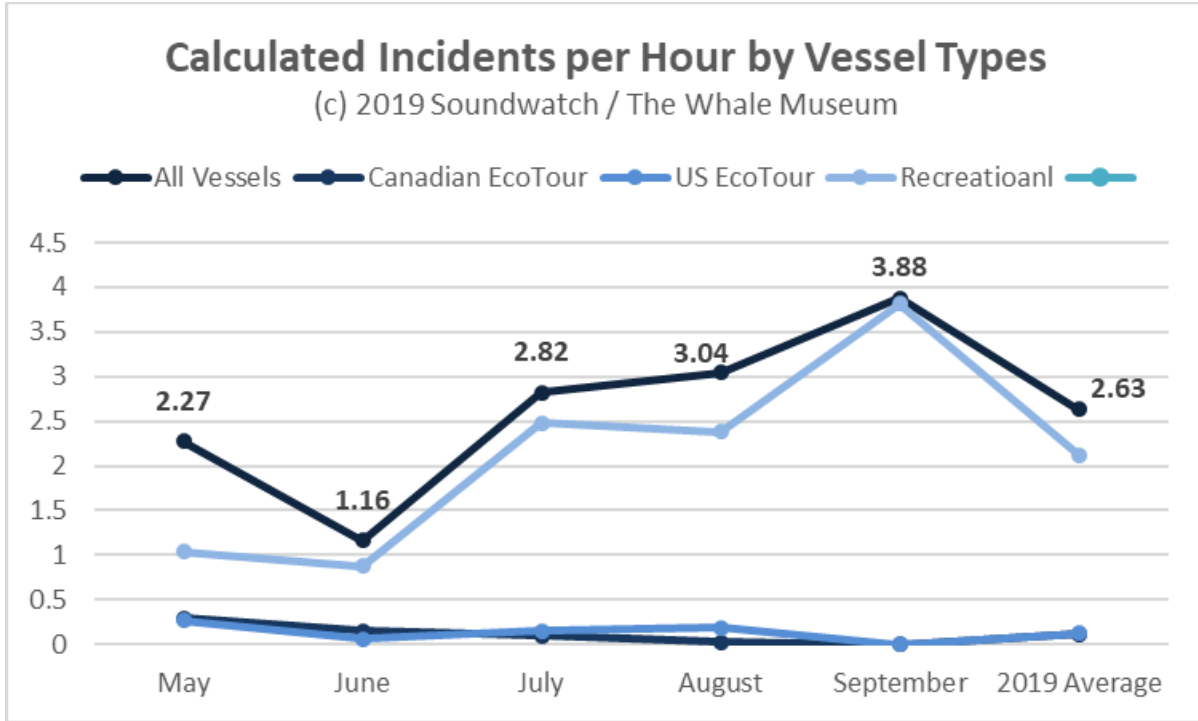


Figure 45: Calculated incident rates per hour by vessel type and month.

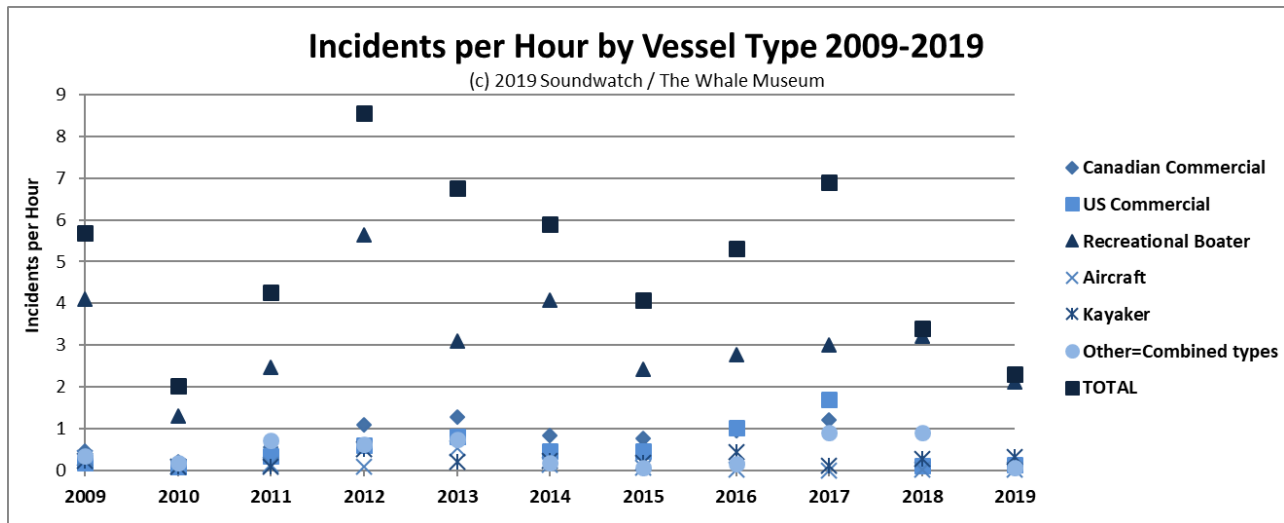


Figure 46: Trend from 2009 – 2019 Guideline and Regulation vessel incidents by type.

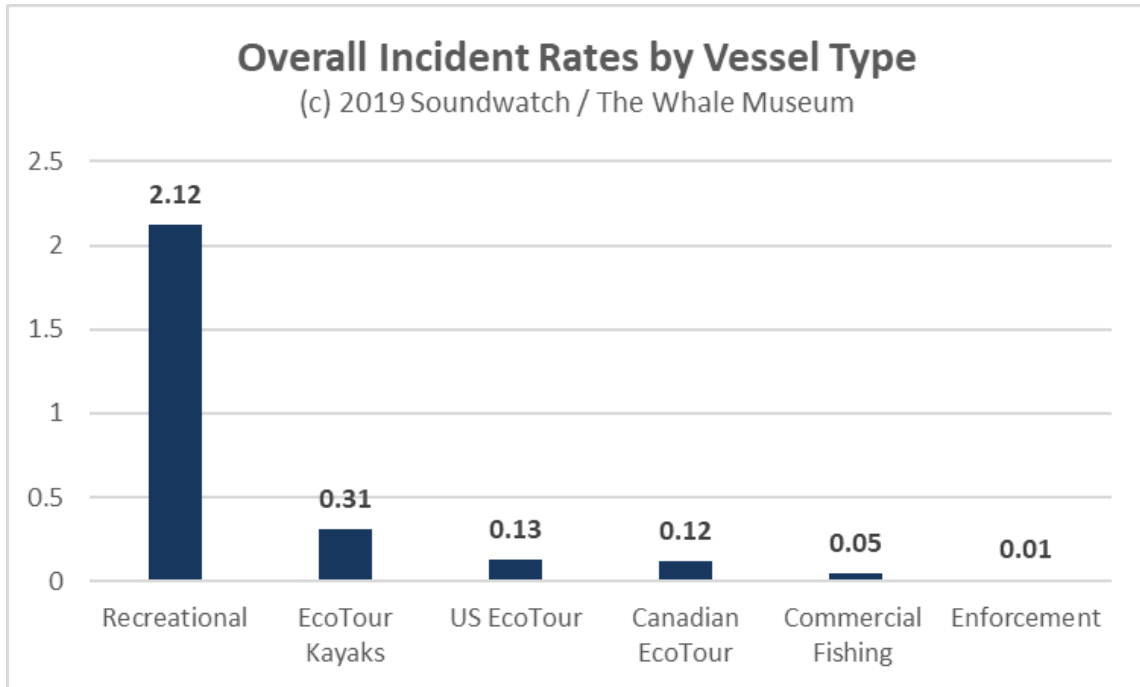


Figure 47: 2019 vessel incidents per hour by all vessel types.

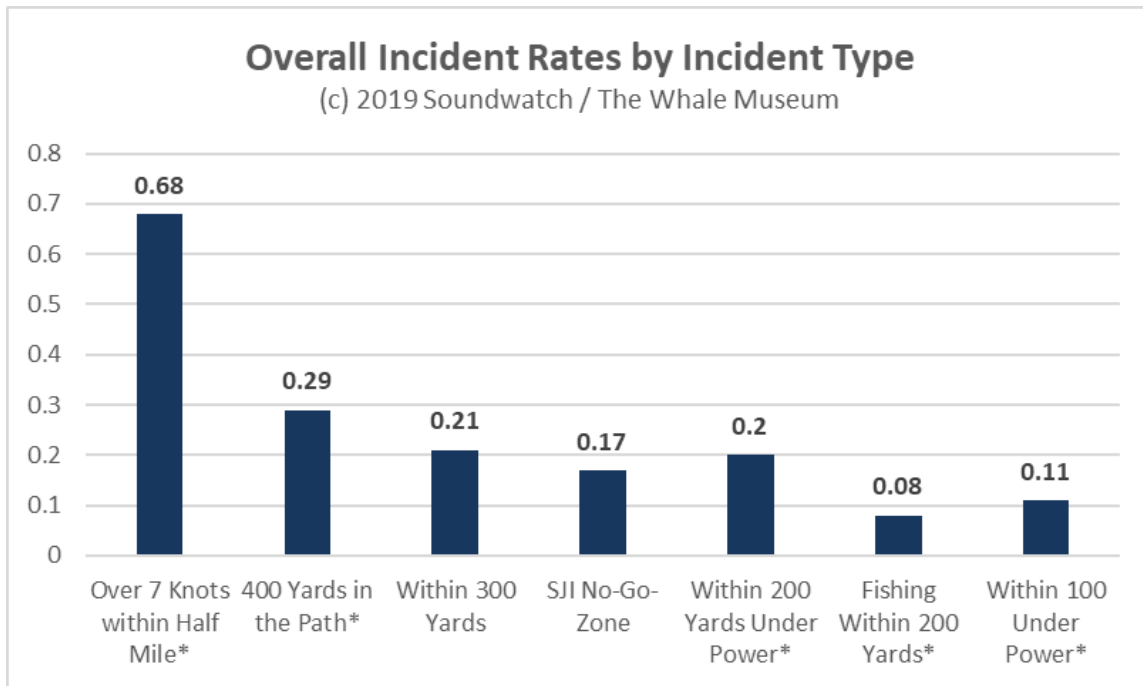


Figure 48: 2019 vessel incident rates per hour by incident type. **Indicates Federal/State Vessel Regulations.*

In 2019, WDFW Law Enforcement was present during 55 of the 648 vessel counts (within one half-mile radius of whales) over 14 days in *U.S. waters* only due to state jurisdiction. Figure 49 and 50 display a greater level of compliance when law enforcement was monitoring ‘whale oriented’ activities. Figure 49 is a simple ratio of all incidents with WDFW on scene or off scene. Figure 50 is time corrected since WDFW was only present for 8% of vessel counts. Incident rates were calculated using number of incidents by hours WDFW was present or not in the top three vessel categories per Soundwatch vessel count. Department of Fisheries and Oceans Canada were present in 4 Soundwatch vessel counts in 2019, as well as some presence by NOAA Office of Law Enforcement, United States Coast Guard, and San Juan County Sheriff.

Across all vessel categories, besides EcoTour, vessel incidents were actually increased with the presence of WDFW (Figure 50). This is the first year in which incident rates have been higher with WDFW present, and this is believed to be due to sampling error. Soundwatch was on scene with killer whales collecting data for 289.9 hours and WDFW was present in Soundwatch data for 34.4 hours. However, WDFW was present with whales more than is reflected in the Soundwatch data. Due to increased coordination between Soundwatch and WDFW, multiple vessels were intentionally spread out to increase education and monitoring of vessels near multiple groups of whales. Due to the increased presence of Transient killer whales and greater dispersion of the Southern Residents, Soundwatch and WDFW frequently communicate to avoid being in the same place with the same whales. Even when present with the same group of whales, Soundwatch and WDFW position vessels at either end of the group to reach more boaters. Therefore, the impact of the presence of enforcement on vessel behavior was not as closely observed by Soundwatch in 2019. Soundwatch is working on adjusting data collection procedures, methods, and operations to reduce this sampling bias and error. With additional resources two Soundwatch vessels could be used simultaneously, with one focused on further investigating some of these specific questions that the larger Soundwatch dataset cannot tease out.

The Whale Museum has operated under a NOAA Research permit since 2012 (NMFS Permit No. 16160/21114). This allows for close approaches in some unavoidable circumstances and these are reported via permit conditions and annual reporting requirements. As part of receiving a research permit, a full review of program methods was completed and any impacts of Soundwatch activities are fully analyzed under MMPA/ESA. The permit carries with it annual reporting obligations that are submitted at the end of each year. In 2019, Soundwatch committed no direct takes against the SRKW.

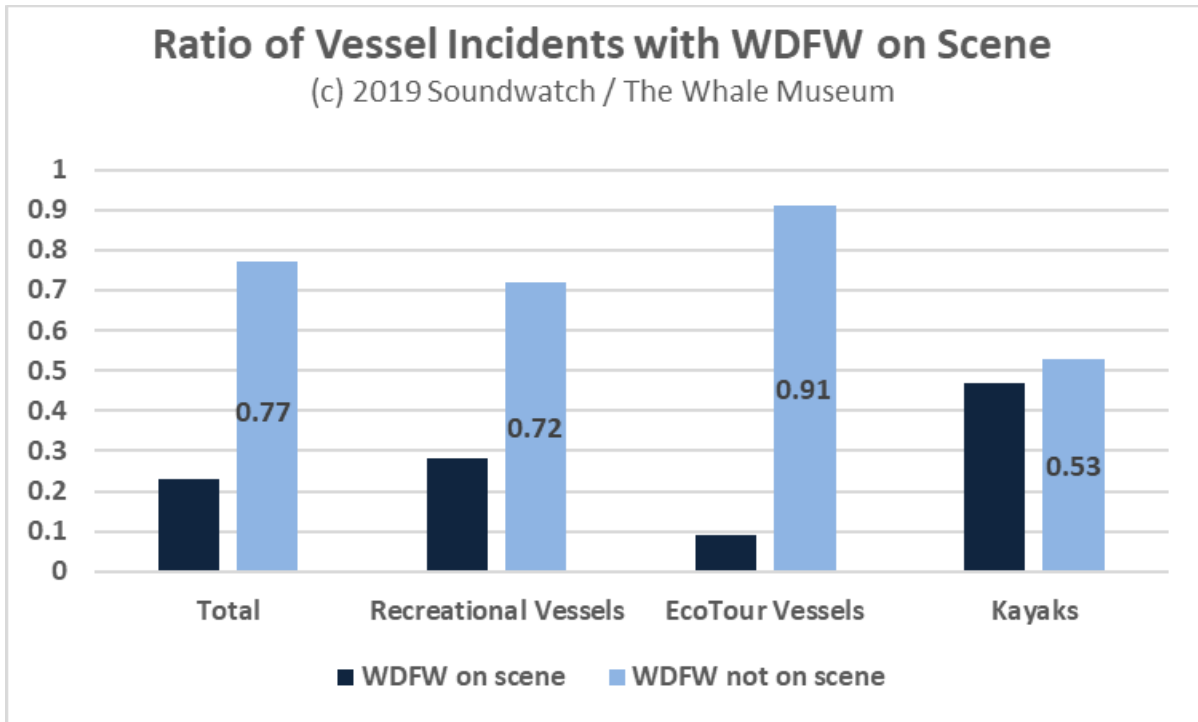


Figure 49: Ratio of incidents recorded with WDFW Enforcement on scene versus WDFW not on scene.

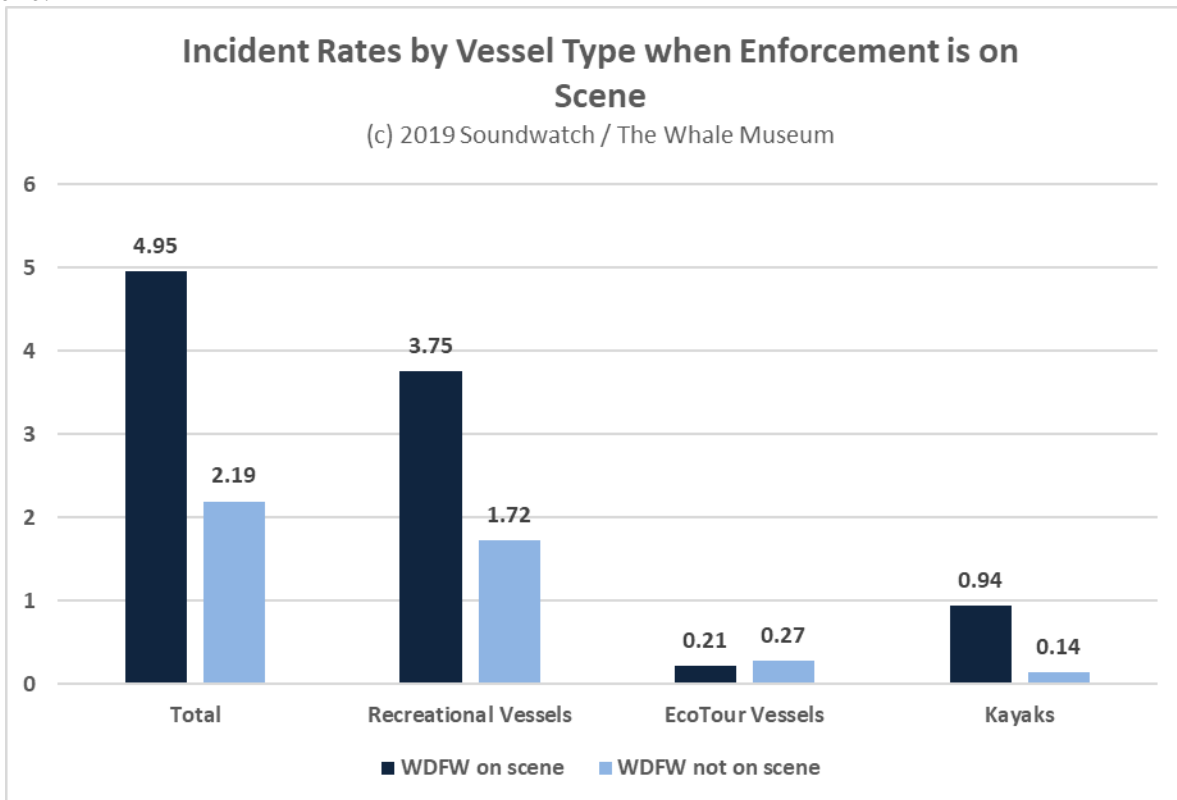


Figure 50: Incident rates per hour by vessel types with WDFW on scene and with WDFW not on scene with whales.

Killer Whale Attribute Data

Soundwatch collected killer whale behavior on the hour and half hour, totaling 289.9 hours or 562 killer whale behavior counts. Behavioral categories (Appendix K1 & K2) were Modified Rest, Traditional Rest, Milling, Socializing (surface active), Travel, and Forage. Evidence of prey was necessary to classify ‘foraging’ behavior. It is important to note that Southern Residents were not present in the sampling area in May and June, as they have been in previous years. Travel was the predominant behavior in all months and across both ecotypes. Figure 51 summarizes behavioral data collected on SRKW and Transient killer whales from May-September 2019. Positive foraging events were only observed five times in Southern Residents and Transients. Traditional resting behavior was observed only once whereas modified rest was seen by both ecotypes in July and August. Foraging/Milling behavior for the SRKWs was mainly observed on the west side of San Juan Island. Transient killer whales were observed to be Foraging/Milling across the Salish Sea, and in noted areas of pinniped haul-outs.

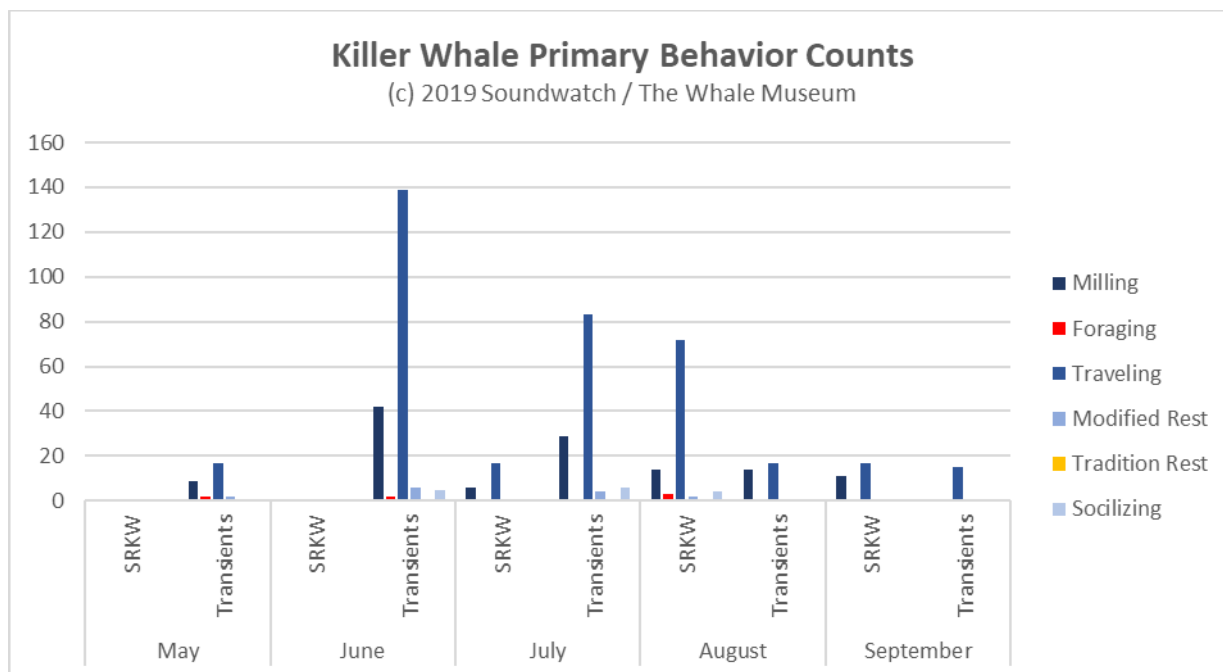


Figure 51: Southern Resident and Transient killer whale behavior counts from May – September 2019 conducted near the hours and half hour by Soundwatch.

Discussion and Recommendations

Whale Warning Flag

In 2018, the Whale Warning Flag was introduced by the San Juan County Marine Resources Committee. Flags were distributed to research, monitoring and private boaters early on in the boating season. Flags were provided to commercial whale watch vessels in 2018 in mid-June, after the start of the boating season, so use of flags was limited by these operators. This led to an inconsistent presence of Whale Warning Flags and inability to analyze their effectiveness. Throughout the winter 2018, and before the summer season in 2019, the commercial whale watch fleet, enforcement vessels and more private boaters were outfitted with flags. Targeted education on the proper use and meaning of the flag was increased through the Be Whale Wise campaign during this time as well.

Over the past six years there has been an overall decrease in average and max number of vessels presence with whales (Figure 52). This could be due to decreased presence of SRKWs, increased presence of multiple groups of Transient killer whales, heightened awareness of the plight of the SRKWs, and other factors. This data also suggests that the Whale Warning Flag did not act as an attractant to recreational vessels to draw them to the presence of whales. Observationally, the Soundwatch crew noted that transiting vessels tended to move away or slow down as they continued to proceed through the area when witnessing the Whale Warning Flag versus stopping to view the whales. However, there are cases of recreational vessels arriving on scene with whales when Whale Warning Flags are present, but these are limited.

In 2019, the average number of whale warning flags within a half mile of all whale species was 2.45 flags with a max of 10 flags. Ecotour (Canadian and U.S. commercial wildlife vessels) had the highest average and max of any vessel type at 1.92 and 7 flags, respectively. Recreational vessels flew an average of 0.73 flags and a max of 2 flags, and other vessels averaged 1.25 flags and max of 4 (Figure 53). Other vessels include Soundwatch, which always flew a whale warning flag and research permit flag when on scene with whales, and other monitoring and research vessels. In 30% of boat counts Soundwatch was the only vessel flying a whale warning flag (Figure 54).

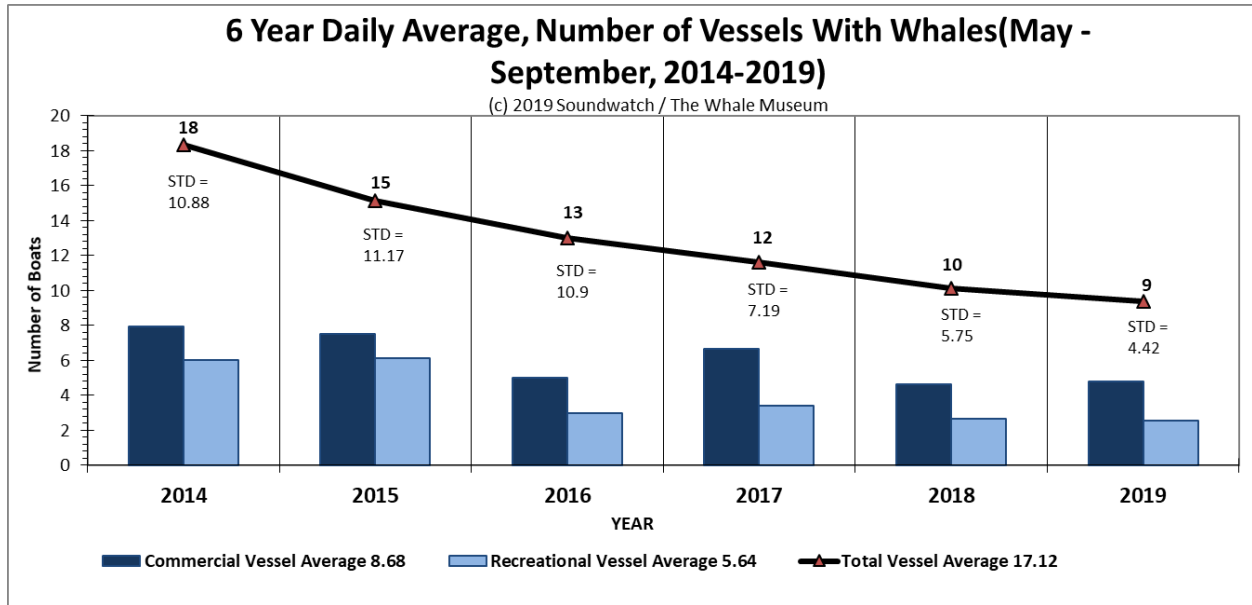


Figure 52: Average number of vessels with whales from 2014 – 2019 displaying a 6-year decreasing trend in average number of vessels with whales, suggesting the Whale Warning Flag did not impact or draw vessels towards the presence of whales.

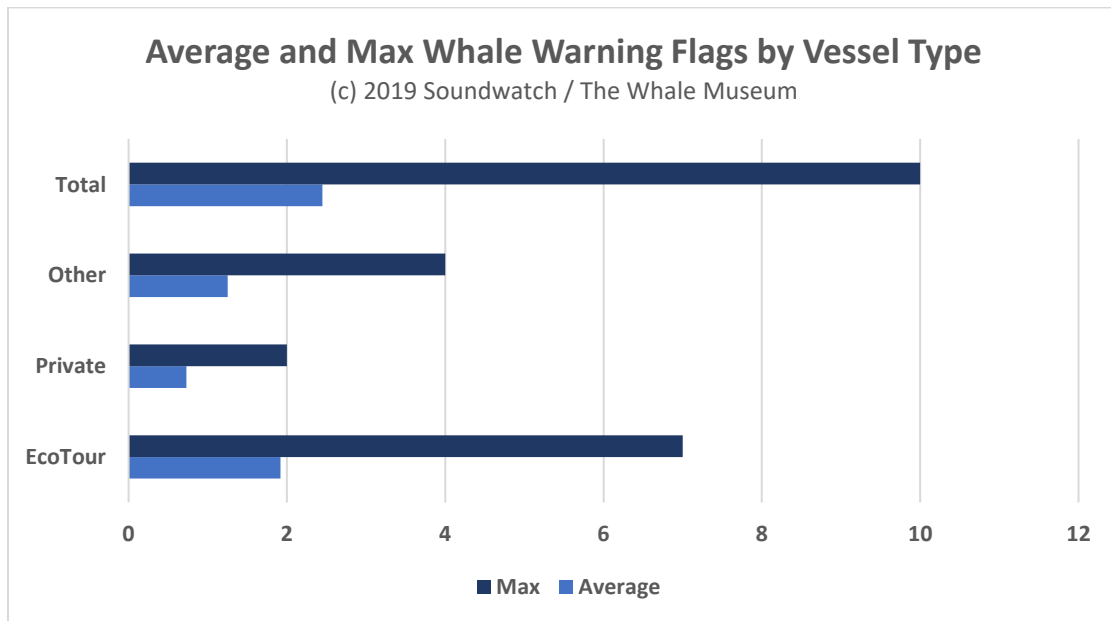


Figure 53: Average and max of Whale Warning Flags within a half mile of whales by vessel type in 2019.

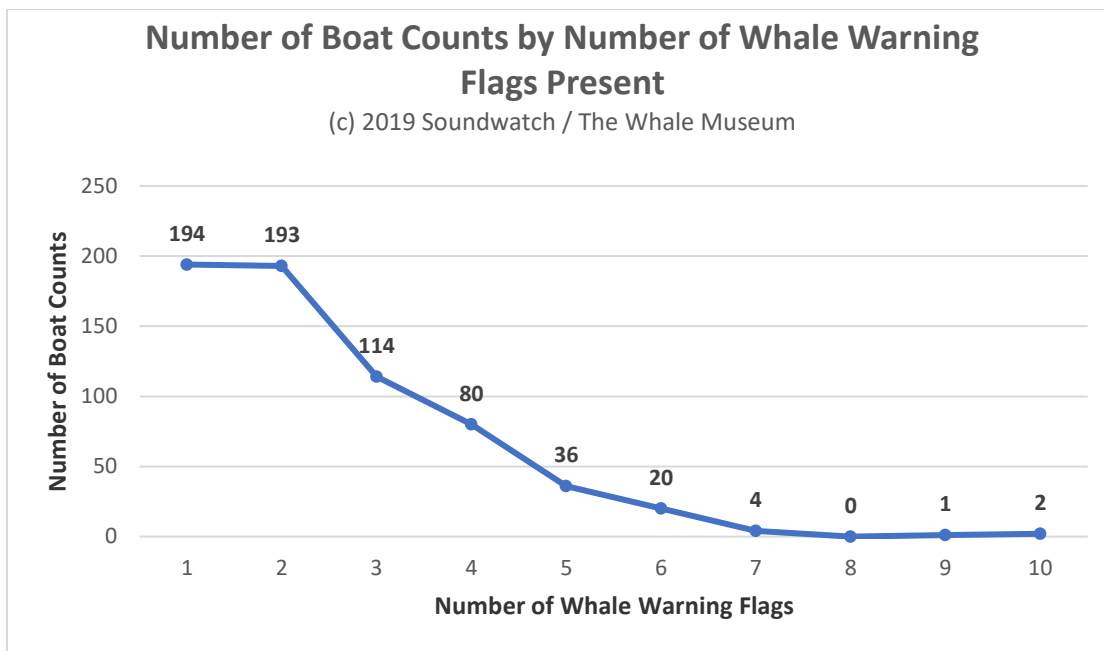


Figure 54: Number of Boat Count with number of Whale Warning Flags present.

As stated earlier, Soundwatch recorded 749 vessel incidents in 2019. Since Soundwatch flew a whale warning flag at all times when present with whales, all incidents recorded were when a flag was present. There were 503 (67%) incidents recorded when there was at least one other flag besides Soundwatch flown. When vessel incidents are displayed graphically against the number of Whale Warning Flags present one might assume that fewer incidents would be observed in the presence of more flags. This may be true, but when compared to boat counts by number of flags present the trend is very similar in that there are less vessel incidents when there are more flags due to the fact there were fewer boat counts with higher numbers of flags (Figure 56). When plotted, the negative relationship between number of vessel counts and vessel incidents is comparable with similar negative slopes (-29 and -24) and strong trends ($R=0.77$ and $R=0.84$) (Figure 55). This further suggests that the reduction in vessel incidents as number of Whale Warning Flags increase is due to the smaller sample size of boat counts with >6 Whale Warning Flags present.

However, when there were greater than 6 flags present no incidents were recorded. This could be due to higher recognition and awareness of whales' presence by boaters due to the sheer number of vessels present. It could also be due to the high proportion of ecotour companies present in these scenarios, which are historically responsible for fewer incidents overall (Figure 57).

Overall, the total number of vessel incidents have decreased over the past two years, but this trend has not been consistent over the last six years (Figure 58). This is due to many variables, including the number of hours on scene with killer whales, presence of Southern Residents, location of killer whale sightings, and other factors. This is why the total number of vessel incidents is not useful in comparing between years. A more useful metric to analyze is the rate of vessel incidents (Figure 58). This is calculated by vessel incidents recorded per hour, but it is also impacted by all the same factors listed above for total number of incidents.

Commercial whale watch vessels are responsible for fewer incidents and are more likely to fly Whale Warning Flags. Therefore, only in rare cases were commercial whale watch vessels flying Whale Warning Flags while they were observed committing incidents of noncompliance. Out of the 749 incidents recorded by Soundwatch, 78 were committed by EcoTour vessels, and of those, 18 were flying Whale Warning Flags. There was only one case in which a private vessel flying a Whale Warning Flag was observed in violation (Table 1).

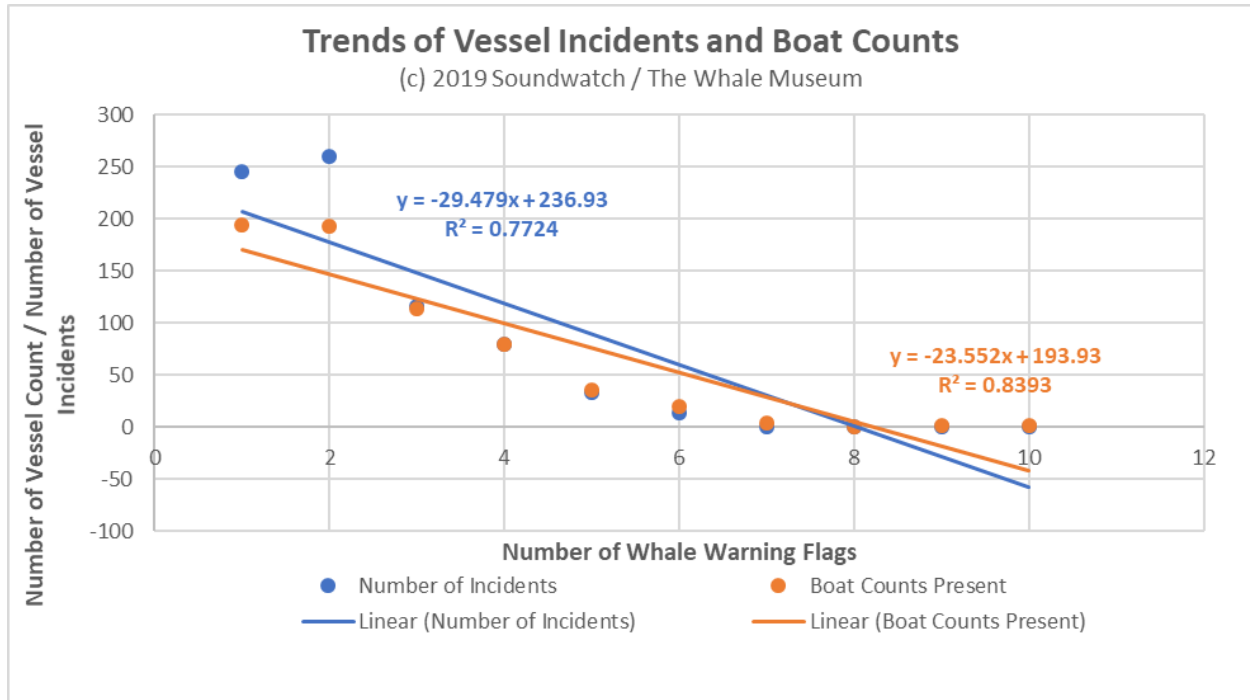


Figure 55: Displays the negative trends of vessel incidents and boat counts as related to number of Whale Warning Flags present.

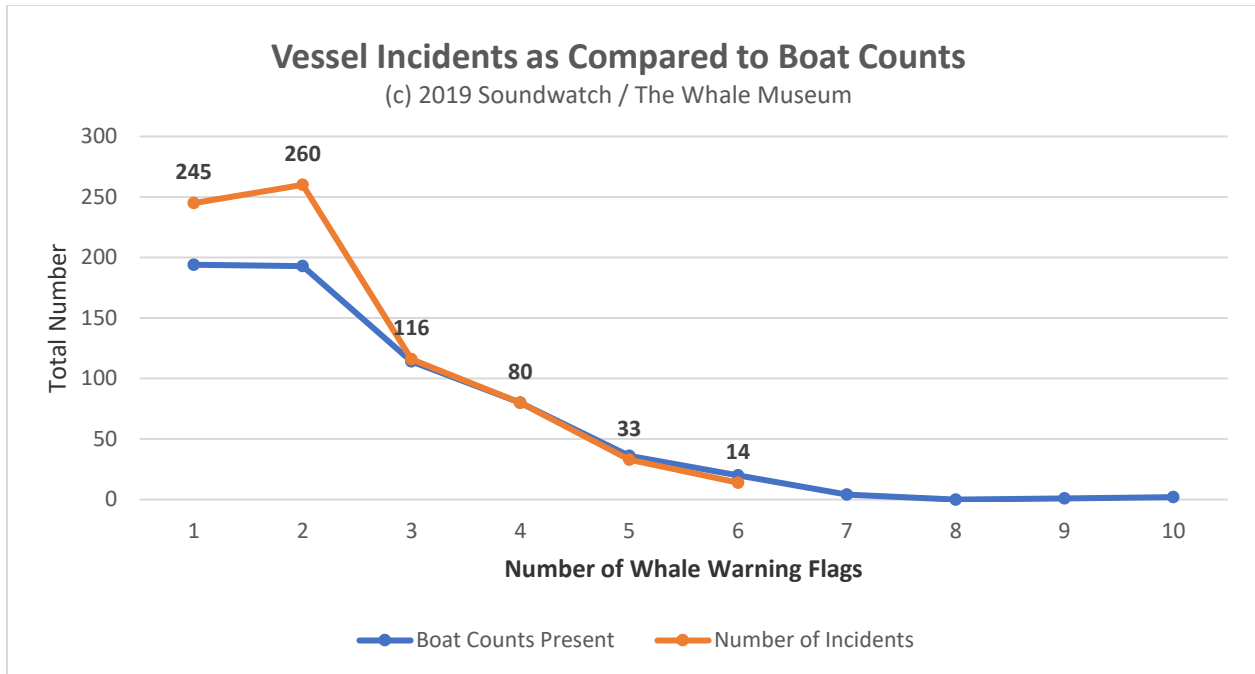


Figure 56: Number of Vessel Incidents and Boat Count by number of WWFs present.

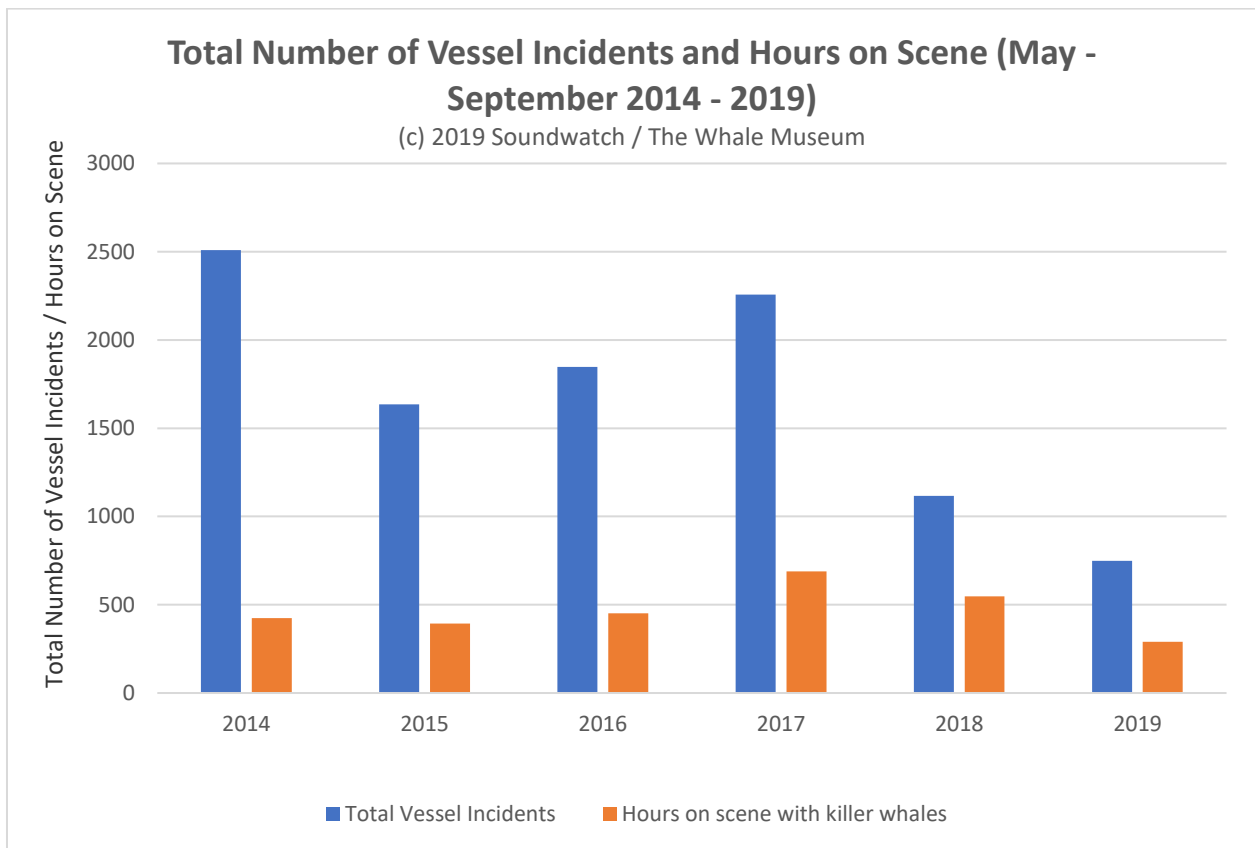


Figure 57: Displays total number of vessel incidents recorded in a year and hours on scene with killer whales during that year.

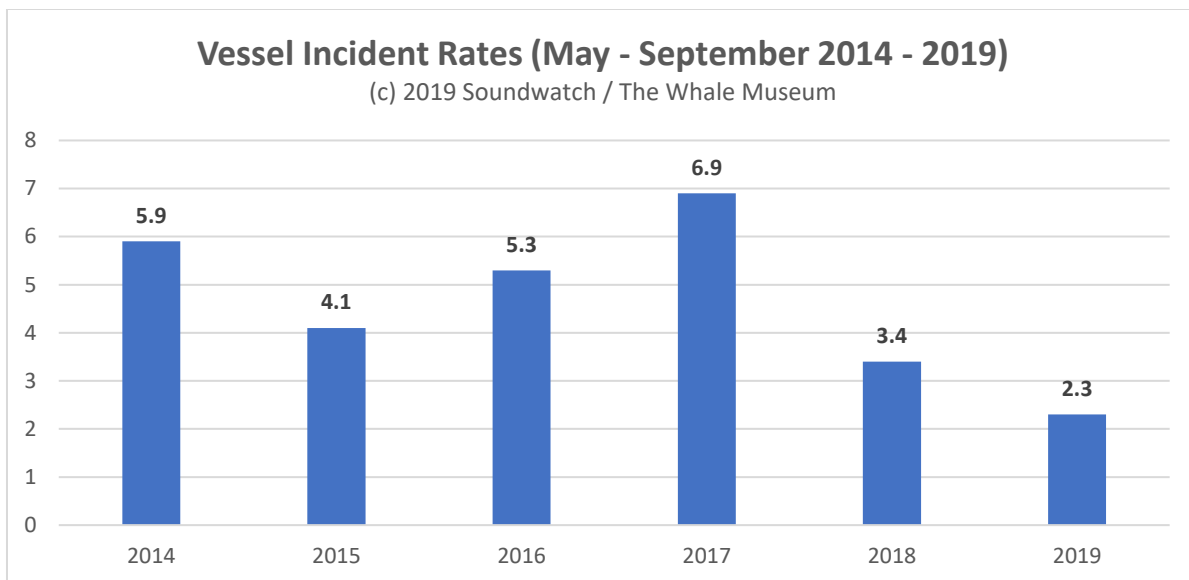


Figure 58: Displays the average vessel incident rate per hour over the past six years.

Table 1: Incidents recorded in which the vessel in question was flying a Whale Warning Flag.

Vessel Type	Number of Incidents	Type of Incident
EU	5	Inshore of Whales
EU	3	Over 7 knots within Half Mile
EU	2	400 in the Path
EU	1	100 Yards Under Power
EU	4	200 Yards Under Power
EU	1	SJI No-Go-Zone
EU	2	300 Yards Under Power
PM	1	Over 7 knots within Half Mile

In 2018, when the flag was first introduced, Soundwatch did not record any usable data due to the lack of presence of the flag out on the water. Deployment methods for the flag appeared to one of the challenges faced by flag recipients at first. Many commercial operators were either slow to utilize their flags or did not utilize their flags due to logistical difficulties. In 2019, under an agreement between the Pacific Whale Watch Association (PWWA) and Transport Canada members were “required” to fly their flags when present with whales. This resulted in an increase in the use of the flags in 2019.

Based solely on observations and conversations with private boaters, the flag seemed to be wanted and well received. One frequently expressed concern was that the flag would act as a means to attract vessels to the whales. However, Soundwatch did not observe this outcome.

Transiting vessels at high speeds and close ranges are the vessels that have the greatest impact and threat to the whales. These vessels benefit the most from the Whale Warning Flag program and therefore reduce impacts to the marine mammals of the Salish Sea (Figure 59).



Figure 59: Image of Soundwatch vessel flying Whale Warning Flag while contacting a boater. Photo by Jeanne Hyde of The Whale Museum.

Effects of EcoTour Vessels on Incident Rates and Presence of Recreational Vessels

The question of whether the presence of commercial whale watch vessels has an effect on the number of incidents committed by recreational vessels can be a complex one. Since the sampling size across number of ecotour vessels present is different the proportion of incidents recorded will be nonstandard as well. Since the sample size is not the same or a bell curve, then statistical analysis will yield weak results. However, when incidents are plotted against how many EcoTour vessels were present at the same time one can see there is a potential reduction in incidents as EcoTour vessels increase (Figure 60). The average number of EcoTour vessels present in 2019 was 4, which correlates which has the largest sample size, as in largest number of vessels counts where there were 4 EcoTour vessels present. One can see that when there are zero EcoTour vessels present the highest number of incidents was recorded. Incidents dropped as the number of EcoTour vessels increased to 3, then incidents increased again mostly likely due to the larger sample size. This may indicate that increased presence of EcoTour vessels reduces incidents caused by other vessels, but further analysis and data is needed and is being pursued. Analyzing the types of incidents that are committed does not seem to be affected by the presence of EcoTour vessels (Figure 61).

Additionally, presence of Private vessels was suspected to be affected by the presence of EcoTour vessels, in that with increased presence of EcoTour vessels around whales this will attract Private vessels and lead to increased presence of total vessels. When average number of Private vessels present by the number of EcoTour vessels present there was no direct correlation (Figure 62). Variable sample size affects this analysis as well, and is plotted with the red line.

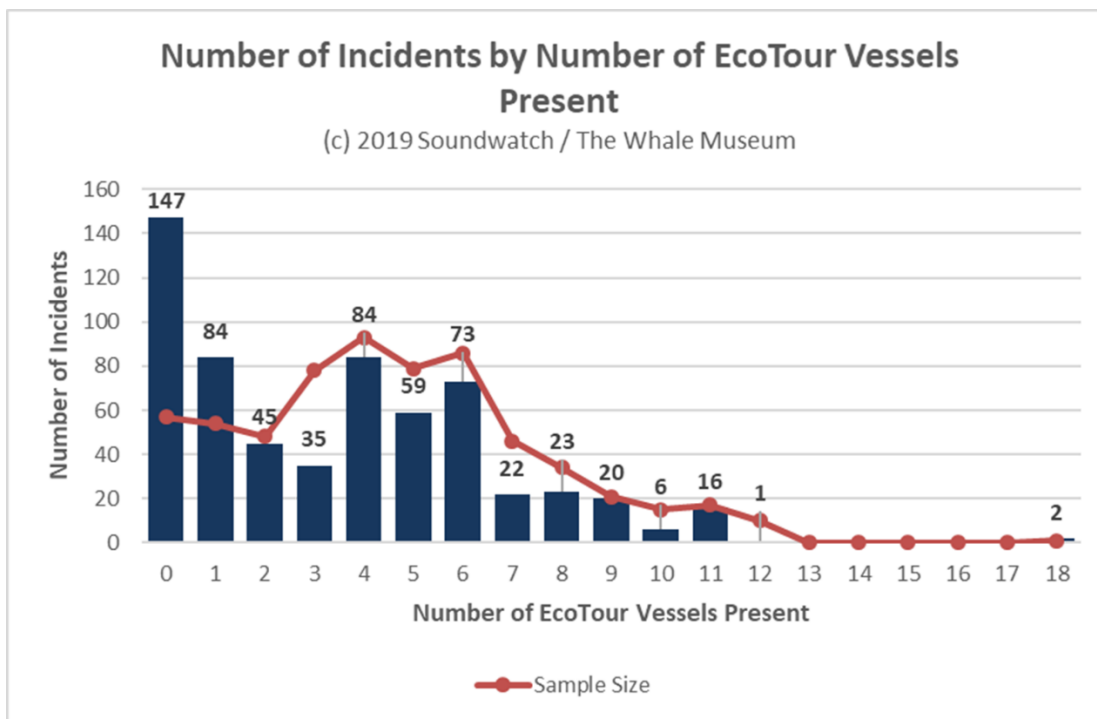


Figure 60: Number of vessel incidents by the number of EcoTour vessels on scene with whales in 2019 plotted against the sample size of EcoTour vessels present.

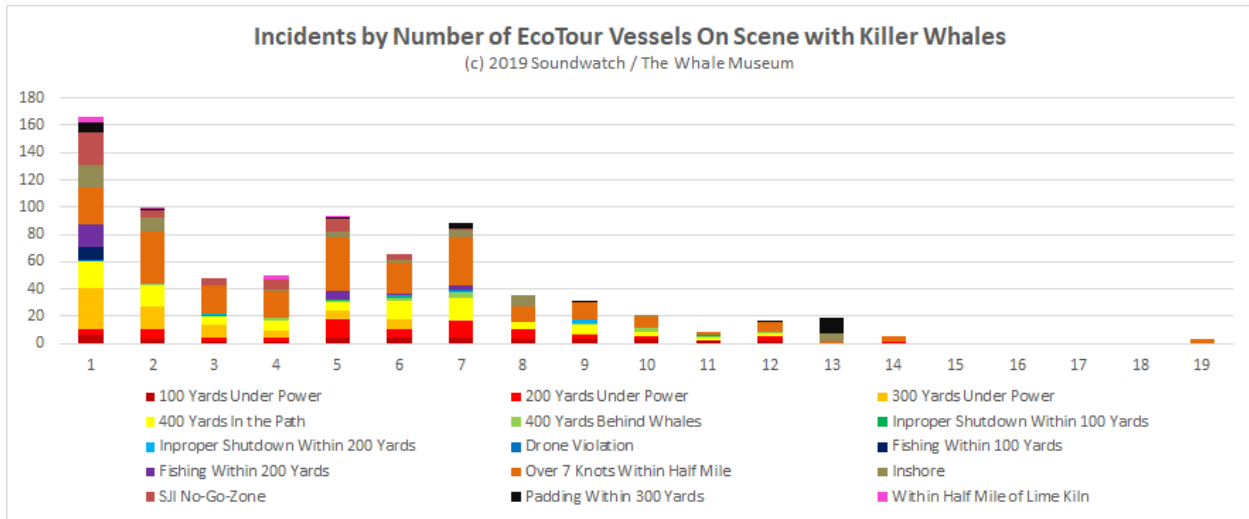


Figure 61. Displays the types of incidents committed by number of EcoTour vessels present.

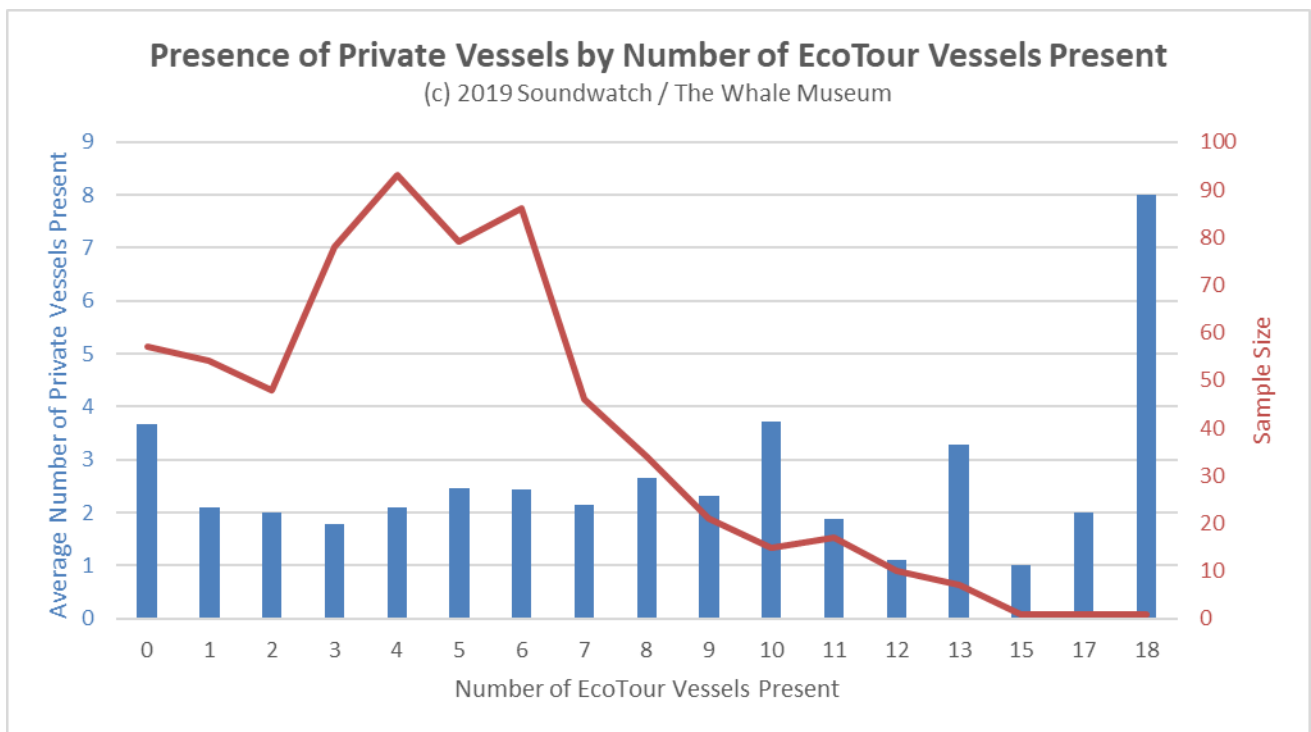


Figure 62. Displays the average number of Private vessels present by the number of EcoTour vessels present. The sample size is plotted as well with the red line.

General Discussion

Soundwatch’s observed vessel trends from 1998-2019 show continued boating pressures and noncompliance with best practice guidelines and vessel regulations for killer whales throughout the Salish Sea; the inland waters of Washington State and British Columbia. Long-term trends demonstrate the need for the continuation and expansion of shore and water-based boater education and outreach efforts, as well as a continued increase in enforcement patrols and enforcement action on the water. Sustainable funding mechanisms for both education and

enforcement efforts are critical. In addition, the development and implementation of a collaborative U.S. and Canadian effort to manage both commercial and recreational whale watching as well as other vessel traffic near whales is needed to reduce potential threats to the whales from vessel presence, behavior and underwater noise. These recommendations were also included in the Technical Memo evaluating the effectiveness of the regulations (Ferrara *et al.*, 2017).

Additionally, increasing the range of the educational outreach to all registered vessels, registered Washington state boaters, etc., would promote more awareness of the regulations and guidelines concerning marine wildlife. Other possibilities include: creating a greater buffer around killer whales could be effective in lessening vessel disturbance to killer whales; create a course on how to safely operate around marine mammals; require whale watch companies to register with the Department of Licensing; distribute BWW information with vessel registration and tabs; and add regulations and guidelines to Washington State Boater Education course. Many of these are potentially being addressed through the Washington State Executive Order, that was signed in March of 2018, and by the Orca Recovery Task Force throughout 2018.

The 2016 - 2019 ESA Section 6 funding provided enhanced WDFW Enforcement presence in the vicinity of killer whales around the San Juan Islands (including a WDFW vessel and one additional FTE officer). The continuation of ESA Section 6 funding, and/or the funding from Washington State's 2019 budget, and other sources, for these programs to conduct more cooperative outreach education, monitoring and enforcement is critically needed. Collaboration of these two programs along with NOAA, DFO, Straitwatch and all *Be Whale Wise* partners is essential for boater education, marine monitoring and enforcement around killer whales.

Lack of the whales' social cohesion and multiple matrilineal groups within the Salish Sea makes it difficult to monitor vessel behavior. As the whales spread out, so do vessels engaged in whale watching activities. Thus, one Soundwatch vessel and/or one WDFW enforcement vessel were left to monitor several groupings of vessels over a greater geographic area instead of just one group in a concentrated area. Because of these challenges, it was necessary for Soundwatch to prioritize monitoring efforts. Prioritization of Soundwatch vessel monitoring were; 1) Southern Resident killer whales, 2) Transient killer whales near/in San Juan County marine waters, 3) killer whales in high traffic areas, and 4) Humpback whales in high traffic areas (San Juan Channel). The long-term Soundwatch database is very effective in tracking vessel and whale behavior trends over many years. However, with changes to SRKW presence and distribution throughout the Salish Sea, Soundwatch's standardized data collection procedures and operations are limiting the utilization of the dataset to answer specific questions, such as effects of WDFW Enforcement. Therefore, Soundwatch is planning to utilize a second vessel to focus more on these specific questions, such as vessel trends and incidents into the summer evenings, in the 2020 season.

Soundwatch will also be allocating resources in 2020 to fill data gaps left by the standard operating hours of on-the-water efforts in previous years. EcoTour whale watching activities have increased the duration of vessel disturbance (>12 hours) to killer whales by offering year-round and sunset trips from July-September. Eight hours of on-the-water effort each day may not take the extended hours into consideration.

Summary of 2019 Soundwatch Data

Vessels

- Soundwatch conducted 648 vessel counts within ½ mile (0.8 km) of whales; 155 with Southern Resident killer whales, 407 with Transients (aka Bigg's) killer whales, and 86 with Humpback whales (Figure 3).
- The numbers of vessels observed within ½ mile of whales (May-September) varies widely by time, date and location with maximum numbers three times larger than average numbers (2019 Max.29, Avg. 9).
- Peak times of the day (May-September) observed with the highest number of vessels within ½ mile whales (22 year trend) usually occur between 11 a.m. and 3 p.m. during the observation hours of 9 a.m. to 5 p.m. with a dip around the 1 p.m. midday lull (associated with commercial vessel congregations which is believed to attract more recreational vessels). However, this trend seems to be weakening over the past two years with numbers of vessels staying consistent throughout the day.
- Soundwatch was able to operate two vessels on the water for 15 days when Southern Resident killer whales or multiple groups of Transient killer whales were present in highly trafficked areas. This added effort was supported by the National Fish and Wildlife Foundation through the Killer Whale Research and Conservation Grant.
- The highest average and max vessel count was recorded in July; May average 7.1 max 21, June average 9.0 max 24, July average 11.0 max 29, August average 8.1 max 22, September average 8.7 max 26.
- Recreational (private) vessels observed within ½ mile of whales have had higher maximum numbers than commercial vessels, but commercial vessels had an overall higher average of vessels within ½ mile of whales; Recreational vessels average 2.4 max 26, while Commercial vessels average 4.7 max 18.
- Soundwatch contacted 468 vessels with 1,469 people on board, averaging 3.2 people per vessel, around whales for education and prevention purposes.
- An average of 25% of recreational vessels contacted for educational purposes were correctly aware of the guidelines and laws for boating around killer whales. Therefore, 75% of contacted boaters were unaware or misinformed about the guidelines and laws for boating around marine mammals in the Salish Sea.

Commercial Whale Watch Industry

- The commercial whale watching season occurs April –October with increasing numbers of U.S. & Canadian commercial whale watch vessels going out year-round and/or starting earlier and going later into the season.
- The bulk of commercial whale watching generally occurs between 9 a.m. and 6 p.m., May-September, with the maximum number of commercial vessels observed within ½ mile of whales occurring in July at 18 vessels and highest average commercial vessels recorded in June at 5.8 vessels.
- Commercial whale watching occurs in the evenings with several U.S. & Canadian commercial trips going out again at 5p.m.-sunset (8:30-9:30p.m., July-August).

- The majority of *active* Canadian and U.S. commercial companies are members of the trans-boundary Pacific Whale Watch Association (PWWA)
<http://www.pacificwhalewatchassociation.org/>
- There are approximately 96 vessels within the PWWA departing from 28 locations in the Salish Sea (vessel count does not include the total number of active kayaks from the PWWA kayak company). These numbers are based on on-the-water observation and online research.
- Canadian commercial whale watch vessels continue to be mostly the smaller rigid hull inflatable (RHIB) style of vessels while the U.S. fleet is made up of mostly larger passenger style vessels. However, recent additions to both fleets have seen increased numbers of large passenger style Canadian vessels and small cruiser style U.S. vessels.

Vessel Incidents

- In 2019, through recommendations made by Governor Inslee's Orca Recovery Task Force, Washington State revised its vessel regulations by increasing the separation distance from vessels and Southern Resident Killer Whales from 200 yards to 300 yards alongside the whales, and restricting vessels to under 7 knots within one half mile of SRKWs. Signed May 8th and effective July 28, 2018 in the middle of the boating season. Similarly, Canada increased vessel approach distances from 200 meters to 400 meters of all killer whales through a Transport Canada interim order effective June 15 – October 15, 2019. Included in the interim order was an agreement signed by most commercial whale watching companies allowing those companies to approach Transient killer whales to 200 meters if they did not approach Southern Resident Killer Whales within their Critical Habitat.
- A total of 749 vessel incidents were recorded by Soundwatch in 2019 (Figure 4).
- Of the incidents recorded 35% were U.S. Vessel Regulation violations; Vessels Within 200 Yards of Whales were 23% and In the Path of Whales were 12%. The greatest number of incidents recorded was under the new Washington State Law of Under 7 knots within a half mile of SRKWs at 30%.
- In 2019, Vessels within 200 Yards of Whales incidents (23% of all incidents) were broken down by; Vessels Stopped within 0-100 yards (<1%) Vessels Stopped 100-200 Yards (1%) Vessels Under Power Within 100 Yards (5%) were made by 75% recreational vessels, 5% Canadian commercial vessels, 17% U.S. commercial vessels and 3% commercial fishing vessels. Vessels Under Power Within 200 Yards (9%) were made by 80% recreational vessels, 9% Canadian commercial vessels, 9% U.S. commercial vessels, and 2% commercial fishing vessels. Fishing Within 100 Yards (1%) were made by 100% recreational vessels. Fishing Within 200 Yards (44%) were made by 1% commercial fishing vessels and 99% recreational vessels. Under Power Following Whales Within 400 Yards (2%) were made by 94% recreational vessels, and 6% Canadian commercial vessels.
- In 2019, In the Path of Whales incidents (12% of all incidents) were made by 71% recreational vessels, 10% Canadian commercial vessels, 8% U.S. commercial vessels, 11% commercial kayaks, and 1% commercial fishing vessels.

- In 2019, Under 7 knots within a half mile of whales incidents (30% of all incidents) were committed by recreational vessels (89%), Canadian commercial vessels (4%), U.S. commercial vessels (3%), commercial fishing vessels (3%), and enforcement vessels (1%).
- In 2019, 72% of all incidents were committed by private/recreational motor vessels, 6% private sailing vessels, 7% commercial kayaks, 5% Canadian commercial vessels, 5% U.S. commercial vessels and 2% by commercial fishing vessels. (Figure 5).
- The changes in ratios of incidents committed by recreational vessels and commercial vessels, and the lower overall number of incidents recorded by Soundwatch, can be attributed to the unique season and heightened awareness and concern over the Southern Resident killer whales. Another contributing factor to reduced incidents by commercial vessels could be the PWWA updated industry guidelines and pressure from the public in light of heightened awareness of the plight of the Southern Residents.

Direct Takes by Soundwatch under Permit # 21114

- In 2019, Soundwatch made 0 Directed Takes under National Marine Fisheries Service Research Permit #21114.
- Due to heightened awareness and presence of other permitted research vessels when Southern Residents were in the area, Soundwatch operated with extreme caution in the presence of whales and did not make close approaches as detailed in our permit #21114.

Spatial Trends

- There are spatial trends indicating that the whales are utilizing the ESA designated SRKW Core Summer Critical Habitat Area differently than in past years.
- In July 2018, Canada updated guidelines for viewing killer whales in the wild to mirror the U.S. Federal Law, Within 200 meters/yards of Whales and In the Path of Whales. Vessel laws were synonymous in the transboundary Salish Sea. However, through recommendations made by Governor Inslee's Orca Recovery Task Force, Washington State revised its vessel regulations by increasing the separation distance from vessels and Southern Resident Killer Whales from 200 yards to 300 yards alongside the whales, and restricting vessels to under 7 knots within one half mile of SRKWs. Signed May 8th and effective July 28, 2018 in the middle of the boating season. Similarly, Canada increased vessel approach distances from 200 meters to 400 meters of all killer whales through a Transport Canada interim order effective June 15 – October 15, 2019. Included in the interim order was an agreement sign by most commercial whale watching companies allowing those companies to approach Transient Killer Whales to 200 meters if they did not approach Southern Resident Killer Whales within their Critical Habitat. It was observed that this difference in vessel regulations lead to confusion and lack of compliance by the public and recreational vessels. This may not be clearly indicative within this one year's dataset when presence of the SRKWs was very limited.
- A large number of vessel types, engaged in a variety of activities, routinely commit a multitude and variety of incident types, with the majority of incident types being contrary to U.S. federal vessel laws throughout the ESA designated SRKW Core Summer Critical Habitat Areas, especially along the near-shore corridor on the west side of San Juan Island.

Education Materials/Onshore Education:

- Kayak Education and Leadership (KELP) brochures were updated and printed for all commercial kayak guides. Additional KELP rack cards for companies, San Juan County Park and The Whale Museum were also created and printed. (Appendix E & F).
- In 2019, 75 commercial kayak guides were self-trained trained and tested on regional wildlife guidelines and regulations as part of the San Juan County Park Kayak Education and Leadership Program (K.E.L.P.) program.
- An online training video for kayak guides was created and made available at the following link; <https://youtu.be/QQoqcakYc-g>
- An online test was also created to test the guides' knowledge of the guidelines and regulations before they launched from San Juan County Park and led tours. (Available upon request.) The test was completed 87 times by kayak guides, company owners, San Juan County Park staff, TWM interns, and TWM staff.
- In 2019, Soundwatch Dock Talks reached 1,796 guests visiting Roche and Friday Harbor Marinas on San Juan Island, Washington.
- The BWW exhibit at TWM, installed in 2016, has reached over 104,000 people.

Individuals and/or Organizations that Collaborated with the Grantee and Performed the Work:

The Whale Museum staff (Executive Director: Jenny L. Atkinson, Finance Manager: Elli Gull and Soundwatch Coordinator: Taylor Shedd) administered grant funds, including accounting and disbursement, from award RA-133F-12-CQ-0057. The Soundwatch Coordinator (Taylor Shedd) along with seasonal Soundwatch driver/educator staff (Allison Northey and Jessica Newley), academic interns (Erin Casellas, Erica McCaughey, and Katherine Wold) and the 43 volunteers were responsible for the outreach, monitoring and data collection activities as well as data entry. We could not conduct such a successful program without the Board of Directors and staff of The Whale Museum, the vision of the former Soundwatch Program Directors, Rich Osborne and Kari Koski, the help of Lynne Barre and Grace Ferrara from NOAA Fisheries West Coast Region, the help of Russ Mullins, Taylor Kimball, Julie Watson, Penny Becker and Washington Department of Fish and Wildlife Law Enforcement Officers, and the assistance and the dedication of the more than 888 past and present interns and volunteers who have collectively contributed more than 72,000 volunteer hours to Soundwatch activities since Soundwatch 1996. Special thanks also go to the numerous supporters along with the following organizations that help support and collaborate with our efforts: NOAA Fisheries West Coast Region, Northwest Fisheries Science Center, Fisheries and Oceans Canada, Washington Department of Fish and Wildlife, San Juan County's Marine Resource Committee, San Juan County Parks, Straitwatch & Cetus Society, U.C. Davis, the Center for Whale Research, Orca Network, Snug Harbor, Roche Harbor Marine and Marina, and the numerous, generous contributions from regional foundations, businesses and individuals over the years. To all our partners and supporters, Thank you!

Literature Cited:

Ferrara, G.A., T.M. Mongillo, L.M. Barre. 2017. Reducing disturbance from vessels to Southern Resident killer whales: Assessing the effectiveness of the 2011 federal regulations in advancing recovery goals. NOAA Tech. Memo. NMFS-OPR-58, 76 p

Seely, E.A., Osborne R.W., Koski K., Larson S. 2017. Soundwatch: Eighteen years of monitoring whale watch vessel activities in the Salish Sea. PLoS ONE 12(12): e0189764. <https://doi.org/10.1371/journal.pone.0189764>

Be Whale Wise

Marine Wildlife Laws & Guidelines for Boaters, Paddlers and Viewers (Revised 2019)

www.bewhalewise.org

Seeing killer whales and other marine wildlife in their natural environment is a thrilling experience.

In our excitement, we sometimes forget that our presence has an effect on wildlife and their habitat. Just like us, marine mammals need space to find food, choose mates, raise young, socialize, and rest.

When we get too close, approach too fast, or make too much noise, we may disrupt these activities and cause the animals unnecessary stress. In some cases, we may be threatening their lives.

Be Whale Wise! Follow the laws and guidelines, set an example for others, and help protect our spectacular marine wildlife.

Why do we need guidelines?

The diversity and complexity of marine life in the inland and coastal waters of British Columbia and Washington is truly extraordinary.

It is a fragile world. Pollution, global climate change and other impacts are taking their toll at all levels of the coastal food web. Many species of marine wildlife, such as the endangered Southern Resident killer whales or orcas, are impacted by human activities.

Meanwhile, vessel traffic in our waters is steadily increasing, placing added pressures on marine animals and their habitats.

We need to minimize our impact. Guidelines and laws are designed to help you employ best practices, while reducing risks of disturbing marine wildlife.

What are the laws:

Regulations in Canada and the U.S. prohibit the harassment and disturbance of marine mammals. Many species are threatened or endangered and subject to additional protections under the Endangered Species Act (U.S.) and the Species at Risk Act (Canada).

Why were regulations enacted?

Southern Resident killer whales are listed as endangered in both Canada and the United States. Vessel impacts have been identified as one of the threats. These regulations are designed to protect killer whales by reducing noise, disturbance and other impacts from vessels. Canadian and Washington State regulations were updated in 2019.

BE WHALE WISE!

DO YOUR PART TO PROTECT MARINE WILDLIFE FROM HARASSMENT AND DISTURBANCE. FOLLOW GUIDELINES AND ALL LAWS.

CANADA

To report marine mammal disturbance, or injured, distressed, dead, stranded or entangled marine mammals or sea turtles:
Fisheries & Oceans Canada B.C. Marine Mammal Incident Reporting 24/7 Hot-Line: 1-800-465-4336

REPORT SIGHTINGS (MARINE MAMMAL & SEA TURTLE):
B.C. Cetacean Sightings Network www.whalemuseum.org
1-866-472-9863
WhaleReport app available on iTunes and Google Play

NEED MORE INFORMATION?
Fisheries & Oceans Canada
www.canada.ca/en/fisheries-oceans.html
Transport Canada 7C-SRWK-ERS-TC@cc.gc.ca
Robson Bight (Michael Bigg) Ecological Reserve:
www.em.gov.bc.ca/BCParks/eco_reserve/robson_bight.html
Stratwatch: www.stratwatch.org or 1-250-580-7723
North Island Marine Mammal Stewardship Association
www.nimmsa.org
MEBS www.seebelab.gov.bc.ca

UNITED STATES

To report a marine mammal harassment, entanglement or stranding:
NOAA Fisheries, Office for Law Enforcement:
1-800-853-1864
Entanglements: 1-877-707-9425
Strandings: 1-866-767-6114
Download the Dolphin and Whale 911 app

REPORT MARINE MAMMAL SIGHTINGS:
The Whale Museum Hotline (U.S. and Canada):
hotline.whalemuseum.org or 1-800-562-8832
Orcas Network (WA State):
orcasnetwork.org or 1-866-622-2638

NEED MORE INFORMATION?
Soundwatch Boater Education Program
www.whalemuseum.org or 1-360-378-4710 ext. 33
NOAA Fisheries, West Coast Region
<http://www.westcoast.fisheries.noaa.gov>

U.S. STRANDING NETWORK
1-866-767-6114

U.S. ENTANGLEMENT NETWORK
1-877-767-9425

CANADIAN MARINE MAMMAL RESPONSE
1-800-465-4336

REGULATIONS FOR KILLER WHALES IN BRITISH COLUMBIA AND U.S. WATERS

What do the regulations require (except for specific exemptions)?

In the US, it is unlawful to:

- Cause a vessel to approach, in any manner, within 300 yards (274.3 metres) of Southern Resident killer whales (SRKW) and 200 yards from transients.
- Position a vessel to be in the path of or behind any killer whale at any point located within 400 yards (365.8 metres) of the whale.
- Travel faster than 7 knots within 1/2 mile of any killer whale or fail to disengage engine within 300 yards.

In Canada:

- Vessels are required to maintain a minimum approach distance of 400 metres from all killer whales in SRKW Critical Habitat; 200 metres from all killer whales in B.C. waters year-round.
- Avoid boating or fishing in Interim Sanctuary Zones. To learn more about SRKW critical habitat, visit <http://bewhalewise.org>.

Who do the regulations apply to? All motorized and non-motorized vessels (including kayaks and paddleboards), with exceptions to maintain safe navigation and for certain types of vessels.

Additional information, specific details on exceptions and more can be found on the website:
<http://bewhalewise.org>

THE WHALE WARNING FLAG INDICATES THAT WHALES ARE IN THE AREA. VESSELS SHOULD SLOW DOWN AND INCREASE VIGILANCE.

TRANS-BOUNDARY LAWS AND GUIDELINES FOR THE U.S. AND CANADA APPLY TO ALL MARINE MAMMALS AND BIRDS.

LAWS:

- **DO NOT** disturb, swim with, move, feed or touch any marine wildlife. If you are concerned about a potentially sick, stranded or entangled animal, contact your local stranding or response network.
- In Canada, **keep 100 metres away** from all whales, dolphins and porpoises or **200 metres away** if they are resting or with a calf and abide by specific approach distances for killer whales.

GUIDELINES:

1. **DO NOT APPROACH** or get closer than 100 metres/yards to any other marine mammals or birds.
2. **BE CAUTIOUS, COURTEOUS and QUIET** around areas of known or suspected marine wildlife activity, in the water or at haul-outs and bird colonies. When safe to do so, turn off fish finders and echo sounders.
3. **LOOK** in all directions before planning your approach or departure from viewing wildlife. Be vigilant for signs of marine mammal presence. Whales may change direction or surface unpredictably.
4. **SLOW DOWN.** Reduce speed to less than 7 knots when within a half mile of the nearest marine mammal to reduce your engine's noise and vessel's wake.
5. **ALWAYS** approach and depart from the side, moving parallel to the animal's direction of travel. If the animal(s) are approaching you, cautiously move out of the way and avoid abrupt course changes. **DO NOT** approach from the front or from behind.
6. **PLACE ENGINE IN NEUTRAL OR SHUTDOWN** and allow animals to pass if your vessel is not in compliance with regulations.

Drones/Unmanned Aircraft Vehicle or System (UAV/UAS) Guidance

The noise and close proximity of drones can disturb wildlife. When viewing marine mammals from the air using a drone: (1) Maintain a 1,000-foot minimum altitude; and (2) avoid buzzing, hovering, landing, taking off, or taxiing near marine mammals (on land or in the water), as these actions may alter animal behavior. Know and follow all local regulations.

Marine Protected Areas, Wildlife Refuges, Ecological Reserves, Parks, and Sanctuaries:

1. **CHECK** your nautical charts for the location of various protected areas.
2. **ABIDE** by posted restrictions or contact a local authority for further information. Avoid voluntary No-Go Zone on the westside of San Juan Island. Be aware of Critical Habitat areas and Canadian Interim Sanctuary Zones (www.gc.ca).

Guideline in Canada: under 7 knots within 1,000 metres of orcas

Law in U.S.: stay 400 metres away from orcas in SRKW critical habitat

Law in Canada: stay 200 metres from orcas

Law in U.S.: stay 400 yards behind orcas

Law in U.S.: stay 400 yards out of orcas' path

Law in U.S.: stay 300 yards from either side of orcas

www.bewhalewise.org

100 METRES/YARDS = 1 FOOTBALL FIELD

100 metres/yards no approach zone for all other marine mammals in US & Canada, and keeping 200 metres away from whales, dolphins or porpoises if they are resting or with their calf.

Appendix A1: Be Whale Wise Guidelines and Federal/State Regulations for Boaters, Paddlers and Viewers; Revised 2019, Double-sided Brochure Version (Available at <http://www.bewhalewise.org>).

Be Whale Wise
Marine Wildlife
Laws & Guidelines
for Boaters, Paddlers
and Viewers
(Revised 2019)
www.bewhalewise.org

**REGULATIONS FOR KILLER WHALES
IN BRITISH COLUMBIA AND U.S. WATERS**

What do the regulations require (except for size of vessel)?
In the U.S., it is a violation to:
- Cause or permit to approach, in any manner, of the 100 yards (27.4 meters) of Southern Resident killer whales (SRKW) or ORC whales from a boater.
- Position a vessel to be in the path of a boated or killer whale at any point located within 400 yards (365.8 meters) of the whale.
- Transit from their hauls within 100 yards of any killer whale or fall to the ground within 100 yards.

In Canada:
- Vessel is engaged in recreational activity, the maximum distance of 400 meters from a killer whale is 1000 feet (305 meters). 200 meters from a U.S. or other U.S. vessel is 300 meters.
- Motor boating within 100 meters from any SRKW, ORC whale more than 5000 ft (1524 m) of fall, visit www.bewhalewise.org.

Who do the regulations apply to? All motorized and non-motorized vessels including kayakers and paddlers, with exceptions for certain safe navigation to avoid collisions with vessels.

Additional information, specific details on regulations and more can be found on the website <http://www.bewhalewise.org>

TRANS-BOUNDARY LAWS AND GUIDELINES FOR THE U.S. AND CANADA APPLY TO ALL MARINE MAMMALS AND BIRDS

LAWS:
- **DO NOT** touch, harass, or feed any marine mammal or bird.
- **DO NOT** touch, harass, or feed any bird, mammal, reptile, amphibian, or fish.
- In Canada, **keep 100 metres away** from all whales, dolphins and porpoises in 200 metres where they are nesting or in a critical habitat for a specific species that is specific for whales.

GUIDELINES:
1. **DO NOT APPROACH** or get closer than 100 metres/yard to any other marine mammal or bird.
2. **BE CAUTIOUS, COURTEOUS and QUIET:** avoid noise of motors or suspected marine wildlife as well as in the water at the bow and mid-chine. Avoid noisy or noisy activities near the water surface and 100 metres/yard.
3. **LOOK** in all directions before you approach or depart. Do not assume you are in the right place. In spite of your own safety, you should not approach a whale or other marine mammal or bird.
4. **SLOW DOWN:** reduce speed to less than 7 knots when within a safe distance from marine mammals or birds.
5. **ALWAYS** approach and depart from the side, moving parallel to the whale. Do not approach from the bow or stern. Do not approach from the bow or stern.
6. **PLACE ENGINE IN NEUTRAL OR SHUT DOWN** and slow down to avoid propeller strikes on marine mammals or birds.
7. **PAY ATTENTION** and move away slowly and carefully at the bow and stern of your vessel.
8. **STOP** on the OFFSHORE side of the whale. Stay on the leeward side of the whale.
9. **ALWAYS** avoid close through traffic or proximity to dolphins. Hold course and reduce speed gradually to avoid close encounters.
10. **LIMIT** your speed to less than 10 knots in the U.S. Canada mariners' vessels should reduce the maximum impact of all speeds regardless of vessel size to allow clearance.

Canada:
- 100 metres from or approach or get closer than 100 metres/yard, 200 metres from a U.S. or other U.S. vessel. 300 metres from a U.S. or other U.S. vessel.
- **Disturb/Unmanned Aircraft/Vehicle or System (DUMVAS) Guidance:**
The use of a motor or other device on a vessel may disturb or harass marine mammals or birds if the vessel is used in a manner that is not in the interest of the safety of navigation or the safety of the vessel.

Marine Protected Areas, Wildlife Refuges, Ecological Reserves, Parks and Sanctuaries:
1. **CHECK** your local charts for the location of various reserves.
2. **AVOID** or proceed with caution in certain locations that are further restrictions. Avoid voluntary No-Take Zones in the western of San Juan Island. Be aware of Critical Habitat in the Central Channel of the Strait of Juan de Fuca.

CANADA:
- Report marine mammals, birds or birds to the nearest coast guard or wildlife officer.
- Marine mammals and birds are protected under the Wildlife Act and the Migratory Birds Convention Act.
- Report marine mammals and birds to the nearest coast guard or wildlife officer.
- Report marine mammals and birds to the nearest coast guard or wildlife officer.
- Report marine mammals and birds to the nearest coast guard or wildlife officer.

UNITED STATES:
- Report marine mammals, birds or birds to the nearest coast guard or wildlife officer.
- Report marine mammals and birds to the nearest coast guard or wildlife officer.
- Report marine mammals and birds to the nearest coast guard or wildlife officer.

REPORT MARINE MAMMAL SIGHTINGS:
- Report marine mammals and birds to the nearest coast guard or wildlife officer.
- Report marine mammals and birds to the nearest coast guard or wildlife officer.
- Report marine mammals and birds to the nearest coast guard or wildlife officer.

NEED MORE INFORMATION?
- Report marine mammals and birds to the nearest coast guard or wildlife officer.
- Report marine mammals and birds to the nearest coast guard or wildlife officer.
- Report marine mammals and birds to the nearest coast guard or wildlife officer.

Appendix A2: Be Whale Wise Guidelines and Federal/State Regulations Poster for Boaters, Paddlers and Viewers; Revised 2019 (Available at <http://www.bewhalewise.org>).

Be Whale Wise
and Follow the Law
It's as easy as 1, 2, 3...

In 2011, NOAA Fisheries Service adopted new regulations under the Marine Mammal Protection Act and Endangered Species Act to protect all killer whales.

1. The **ONE** place not to be is in the path of whales. Don't position your vessel in the path of oncoming whales within 400 yards of a whale.

2. Stay at least **TWO** hundred yards away from any killer whale (200 yards = the distance of two football fields or about 200 meters).

3. Remember these **THREE** ways to Be Whale Wise: follow the guidelines for viewing all wildlife, check for local protected areas, and restrictions, and always be safe.

400 yards
200 yards
400 yards

WHO do the new rules apply to? All motorized and non-motorized vessels (including kayaks), with exceptions to maintain safe navigation and for certain types of vessels - government vessels in the course of official duties, ships in the shipping lanes, research vessels under permit, and vessels lawfully engaged in commercial or treaty Indian fishing that are actively setting, retrieving, or closely tending fishing gear.

WHAT do the new rules say? Except for specific exceptions, it is unlawful for any person subject to the jurisdiction of the United States to:
I. Cause a vessel to approach, in any manner, within 200 yards (182.9 m) of any killer whale.
II. Position a vessel to be in the path of any killer whale at any point located within 400 yards (365.8 m) of the whale.

WHEN do the new rules go into effect? May 16, 2011.

WHERE do the new rules apply? In inland waters of Washington State - east of the entrance to the Strait of Juan de Fuca and south of the U.S./Canada international boundary.

WHY did NOAA adopt new regulations? Southern Resident killer whales were listed as endangered in 2005. Vessel impacts were identified as one of the threats. These new regulations implement an action in the recovery plan and are designed to protect all killer whales by reducing impacts from vessels. Additional background information on the rationale and analyses to support the regulations is available at www.nwr.noaa.gov.

Visit www.bewhalewise.org to learn more, download the laws, regulations, and guidelines, and to report violations.

NOAA
Report Violations
NOAA Office for Law Enforcement
1-800-653-1964
or online at
www.bewhalewise.org

Appendix B: Federal and State Vessel Regulations for Killer Whales Double-sided Rack Card used by WDFW in 2016 and 2017.

2015 RECREATIONAL VESSEL LAUNCH SIGN OUT SHEET
 Permit required before launching. Sign EACH vessel out every time you launch!

DATE	TIME	VESSEL TYPE K=Kayak (includes all human-powered boats) B=Boat (motorized vessels)	# of PEOPLE aboard VESSEL	PRIMARY ACTIVITY D=day trip M=multi-day W=view wildlife C=cruising F/C=fish/crab O=Other	ZIP or POSTAL CODE	COMMENTS	STAFF USE
9/12	11am	K	2	D	98250	South	
9/12	11am	K	3	D	98221	South Back Bay	
9/12	12:50	K	2	D	98250	W.	
9/17	2:15	K	2	D	98122	North	
9/12	7:20	K	2	D	98250	North	
9/17	1:30	K	2	D	98250	South	
9/18	4:45	K	1	D	98155	South	
9/25		K	2	D	98117	South	
9/25	17:45	K	1	D	98116	South	
9/26	11:15	K	2	D	98116	South	
9/28	12:15P	K	2	D	97107	South	
9/28	12:50P	K	2	D	98201	?	
9/28	12:40	K	2	D	98203	?	
10/1	11:00	K	2	D	98117		
10/1	12:30	KX4	2/2/1/1	D	98250	Weather postponed	
10/28	3:30	K	1	F/O	98250	Stockholm	
10/28	4:15	K	3	W	98260		

Appendix C: 2015 KELP Program Park Recreational Boater Launch Sign-out Sign-out Form

KAYAK SIGN IN SHEET 2015
 For commercial kayak companies only

DATE	COMPANY	# GUESTS	# GUIDES	# BOATS	TIME OUT	TIME IN	GUIDE	PARKING
3/4	DSK	2	1	2	11:30	1	KMY	No
3/6	DSK	2	1	2	12:30	3	KMY	No
3/7	DSK	3	1	2	12	4:15	KMY	No
3/7	SQ	2	2	2	12:15	4:20	MCS	Yes
3/7	DSK	2	1	2	12:30	2:45	CM	No
3/21	DSK	2	2	3	2:30	4:45	KMY	NO
3/22	DSK	8	1	5	9:45	11:45	CM	NO
3/23	SQ	10	1	6	11:00	5:00	MCS	Yes
3/23	DSK	2	1	2	2	1:45	CM	NO
3/24	DSK	2	1	2	2	4:45	Kelly	No
3/24	SQ	7	3	3	11:00	5:00	MCS	Yes
3/26	DSK	5	3	5	12:30	2	CM	NO
3/27	DSK	2	1	2	12:30	3	CM	NO
3/28	SQ	5	1	3	12:45	4:45	MCS	Yes
3/28	DSK	4	1	3	2:15	5	CM	NO
3/29	DSK	2	1	2	9:00	11:45	M	N
3/29	SQ	5	1	4	2	5:15	JP	Y
3/30	DSK	2	2	2	2	3:30	CM	NO TR
4/1	DSK	2	1	10	2:00	M	N	
4/2	DSK	4	1	3	12	4:30	Kelly	No
4/2	SQ	6	1	3	1	5	JP	Y
4/4	DSK	4	1	3	1	4:30	CM	NO

All Kayak Companies Must Obtain Valid Permit
 Prior to Launching
 Launch and Camping Fees Must Be Paid At Time of Park Use

Appendix C2: 2015 San Juan County Commercial Kayaker Launch Form.

VESSEL PERMIT SAMPLE

**San Juan County
Parks & Recreation**

Complete & deposit with payment

Date permit issued _____
 Permit issued by _____
 Primary vessel operator _____
 City/ST/Zip _____
 Number of people * (list to right →) _____
 Vessel type: kayak power boat
 Other _____
 Single use Multi Seasonal
 Date/s valid _____ campsite # _____

EXACT PAYMENT – NO CHANGE GIVEN

\$ PAID _____ **NO REFUNDS.**

Cash Check # _____
 Fee waived-San Juan County resident

♦Affix colored TAG
to bow of vessel in clear view
♦Keep Vessel Launch Permit
with you on the water.

Primary vessel operator signature _____

***Permit issued to (list all names):**


Date permit issued _____
 Date/s valid _____
 Permit issued by _____
 \$ Paid _____

NO REFUNDS

♦Affix colored TAG
to bow of vessel in clear view.
♦Keep Vessel Launch Permit
with you on the water.

THANK YOU!

**San Juan County
Parks & Recreation**
 350 Court Street #8
 Friday Harbor WA 98250
 Admin. Office 360-378-8420
 360-378-8420 parks@sanjuanco.com




Appendix D: 2013 - 2019 San Juan County Park Recreational Boat Launch Permit Form.

ADDITIONAL K.E.L.P. GUIDELINES
All paddlers attempt to abide by these voluntary Guidelines to help preserve & protect our marine environment.

- Human-powered vessels may touch if they can safely maintain 200 yards from the whales.
- Paddle on the leeward side of whales. If paddling in a group, all paddlers will stay close together.
- To avoid being in the path of the whales, paddlers should start moving out of the path of oncoming whales well before the whales are within 400 yards.
In some cases, paddlers may need to stay where they are, or move further offshore, to avoid being within 200 yards of whales & to avoid being in the path of the whales.
- If whales are approaching within 200 yards of shore, paddlers move into shore as close as possible (safely) in help boats, raft up, secure themselves, and stop paddling until the whales have passed by.
Paddlers will avoid headshots.
- If paddlers have taken all measures and still find themselves unexpectedly out of compliance with the laws, they will:
Paddle out of the path of oncoming whales, 400 yards from the whales.
Immediately stop paddling & raft up within 200 yards until the whales have passed by.
- Paddlers shall avoid disturbing haul-out areas for watching birds and/or sea bird nesting sites by paddling in at least a 100 yard arc whenever possible.
Avoid making noise, direct eye contact, and sporadic movements.
May through October is the most sensitive time of the year for breeding seals, sea lions, and nesting birds.
- Paddlers will maintain a 200 yard distance from any National Wildlife Refuge. No landings are permitted except at designated areas.

**Be Whale Wise
SOUNDWATCH
K.E.L.P.**




Human-powered vessels have the unique challenge of limited maneuverability and a variety of safety concerns that require special consideration in order to remain in compliance with federal laws and to reduce the overall risks of disturbing marine wildlife.

FEDERAL VESSEL REGULATIONS IN THE INLAND WATERS OF WASHINGTON DECLARE THAT IT IS UNLAWFUL TO:


- Cause a vessel to approach, in any manner, any killer whale within 200 yards.
- Position a vessel to be in the path of any killer whale at any point located within 400 yards.

The law applies to all types of boats, including motor boats, sailboats, kayaks, and paddle boards.

Some exceptions apply, including vessel safety research activities, fishing commercially, cargo vessels traveling in established shipping lanes, and government & permitted research vessels.



SAN JUAN ISLAND



MAP INDEX

- NATIONAL WILDLIFE REFUGE
- SENSITIVE AREA
- PUBLIC LANDS
- BOTTOMFISH RECOVERY AREA
- MARINE RESERVE
- VOLUNTARY MOTOR BOAT EXCLUSION ZONE

ALL RESPONSIBLE PADDLERS OF ANY HUMAN-POWERED VESSELS:

- Are aware of and strive to follow all local, state, and federal laws, and the *Be Whale Wise* Guidelines governing behavior around killer whales, other marine wildlife, and in Marine Protected Areas (see map).
- Have a trip plan before leaving shore. This includes knowing the area's boating laws, accessible public landing areas, safety issues, and environmental conditions.

Map Index Description

Marine Reserves
Regulations: Closed to all shellfish & bottomfish harvest. See WDFW Marine Area 7 rules for exact locations. **Salmon Fishing Closure:** No salmon fishing within 100 yards of follow and low islands to reduce roachfish mortality.

National Wildlife Refuges
Boaters are to stay 200 yards away to avoid disturbing marine mammals & birds.

Bottomfish Recovery Zones
Guidelines: No bottom fishing within 1/4 mile offshore to protect and restore regional fishing.

Voluntary Motor Boat Exclusion Zone
Remain 1/4 mile offshore when whales are present. 1/2 mile "No Go Zone" in Lime Kiln Point State Park area when whales are present.

Sensitive Areas
Are marked for seal haul-outs & seabird nesting sites. Additional Sensitive Areas not marked on the "Area Detail" map include **Espresso Habitat:** seagrass provides critical habitat for juvenile fish. Please avoid disturbing sediments and vegetation.

Appendix E: 2019 Kayaker Code of Conduct Brochure, Folded, Double-sided (Available at <http://www.whalemuseum.org>)

Be Whale Wise SOUNDWATCH K.E.L.P.

The Kayak Education & Leadership Program (K.E.L.P.) is a program that informs kayakers on marine wildlife regulations and guidelines in the San Juan Islands with the aim to reduce human-powered vessel disturbance to Southern Resident Orcas and all marine wildlife.

Human-powered vessels have the unique challenge of limited maneuverability and a variety of safety concerns that require special consideration to remain in compliance with federal laws and to reduce the overall risks of disturbing marine wildlife.

GUIDELINES FOR KAYAKERS WHEN ORCAS ARE PRESENT

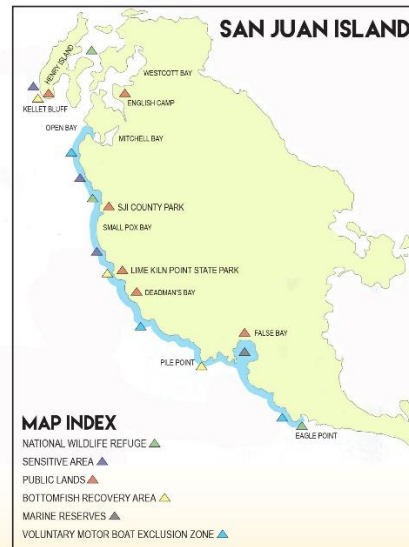
The Kayakers' Code of Conduct is a set of San Juan Island orca-specific guidelines meant to be used along with regional Be Whale Wise Marine Wildlife guidelines and current Federal Vessel Laws.

- Do not launch from shore if you are unable to maintain a distance of 200 yards from the whales.
- Paddle to shore or further offshore to maintain 200 yards to the side and 400 yards out of their path.
- If within 400 yards of orcas, kayakers should paddle toward shore, secure themselves (ideally in kelp beds), raft up, stop paddling, and wait until the orcas are 400 yards away.
- If offshore of orcas and within 400 yards, raft up for safety in boat traffic (preferably kayakers will always be in shore of boat traffic).
- Adjust your plan of action according to the whales' direction of travel and the state and federal laws.
- Maintain a 100 yard distance from all other marine mammals.

www.whalemuseum.org





Marine Reserves

Regulation: Closed to all shellfish & bottomfish activities. (See WDFW Marine Rules 7 for exact locations.) **Salmon Fishing Closure:** No salmon fishing within 300 yards of Yellow & Low Islands to reduce rockfish mortality.

National Wildlife Refuges

Boaters are advised to stay 200 yards away to avoid disturbing marine mammals & birds.

Bottomfish Recovery Zone

Guideline: No bottomfishing within 1/4 mile of shore to protect & restore regional fishing.

Voluntary Motor Boat Exclusion Zone

Guideline: Remain 1/4 mile offshore when orcas are present.
Guideline: 1/2 mile no go zone at Lime Kiln Point State Park when orcas are present.

Sensitive Areas

Areas marked are for seal haul-outs & seabird nesting sites. Eelgrass beds provide critical habitat for juvenile fish. Please avoid disturbing sediments & vegetation.

Appendix F: 2016 - 2018 Kayaker Code of Conduct Rack Card, Double-sided (Available at <http://www.whalemuseum.org>)

VESSEL CONTACT										
Time	Location	Latitude	Longitude	why contacted?	Took BWW? Why Not?	Prev Cntct?	Redo?	Incident Recorded?		
Vessel Incident Log										
Time 24hour	General Location Name/Dir/Distance	Lat Decimal Minutes	Long Decimal Minutes	Quad Pick one!	VESSEL CODES NOVESSEL ID'S NEEDED		Incident Code #'s	Previous Contact: Yes/No?	Photos? Yes/No?	Comments on Situation:
					TYPE	ACT				

Appendix G: Soundwatch Data Sheet Vessel Contact.

Appendix H: Soundwatch Data Sheet Vessel Incidents.

DATE:	Time	Lat	Location Name: Dir: Distance:			Total Count:	Total Eco:	Total Priv:	Total: Kayak		Count: A B											
	Sea St.	Long	Quad:	Weather:	Visibility:	EU	EC	PM	PS	EK	PK	CA	PA	MM	RP	GW	GN	GD	MW	MX	MY	OTHER/DERIVE:
Weekend <input type="checkbox"/>	Port: J Jp K Kp L Lp T		Vessel Activity?		Whale Crn/Mhr																	
Weekday <input type="checkbox"/>	Dir: DIRNON DIR: N S E W		Fish																			
Holiday <input type="checkbox"/>	Crnc: CTC THT LOO SPRD SPRD Gps: dc th loo		Transit																			
	Frmn: FLNK LIN NONLIN		Specific RVIS:		Resch NonWhale																	
	Spd: Mnts S lo Med Fst Porp				Enforce Active																	
Boating	BhvST: Tvl Rst Mill Sod				Acoustic > 1/2ml																	
	Cmnts:				Other Descp:																	

Appendix I: Soundwatch Data Sheet Vessel Count/Whale Survey.

FAST/SPEED		
2.0	speed	vessel traveling over 7 knots w/in 400y/366m of whales, fast w/in 1/4 mile (440y/402m)
2.1	speed - approaching scene	vessel traveling over 7 knots w/in 400y/366m of whales, fast w/in 1/4 mile (440y/402m)
2.2	speed - departing scene	vessel traveling over 7 knots w/in 400y/366m of whales, fast w/in 1/4 mile (440y/402m)
IN PATH		
NEW 2011 LAWS		
3.1A	In path 200-400 yds	w/in 200y/183m corridor path in front of whales between 200-400y/183-366m ahead of whales
3.3	In path - cross	crossing path of whales, vessel traveling across expected path (200-400yds) whales predictable
APPROACH		
4.1	approach - head on	vessel approaching a whale/group head on w/in 200-400y/181-366m when whales are traveling in a relatively predictable pattern
4.2	approach - behind	vessel approaching/traveling behind a whale/group w/in 200-400y/181-366m when whales are traveling in a relatively predictable pattern
W/in 100 YARDS/M		
5.1	100y/91m - stopped	vessel stopped w/in 100y/91m of whales
5.2	100y/91m - under power	vessel under power w/in 100y/91m of whales
5.4	100y/91m - fishing	vessel fishing w/in 100y/91m of whales (did not attempt to move out of path of whales)
W/in 200 YARDS/M		
NEW 2011 LAWS		
6.1	200y/183m - stopped	vessel stopped w/in 200y/183m of whales
6.2	200y/183m - under power	vessel under power w/in 200y/183m of whales
6.4	200y/183m - fishing	vessel fishing w/in 200y/183m of whales (did not attempt to move out of path of whales)
INSHORE		
AREA RESTRICTION		
Placeholder for WDFW Proposed New SLOW ZONE Guideline: NOT IN EFFECT as of June 2011		
40.1	area restriction - SJIVNBZ 1	vessel w/in 1/4mile (440y/402m) of the SJI shoreline in the determined zone with whales present
40.2	area restriction - Lime Kiln	vessel w/in 1/2mile (880y/808m) of shoreline 1mile radius of Lime Kiln Light with whales present
40.3	area restriction - NWR	vessel w/in 200y/183m of U.S. National Wildlife Refuse (NWR) site
40.4	area restriction - RRER	vessel w/in 100y/91m of any Race Rocks Ecological Reserve shoreline
40.6	area restriction - SJIVNBZ 2	vessel w/in 1/8mile (220y/201m) of ANY shoreline with whales present
40.7	area restriction - SJI Slow Zone	vessel > 7 knots w/in 1/2mile (880y/808m) SJI VNBZ with whales present **WDFW PROPOSED New Guideline**
AIRCRAFT		
50.1	aircraft - low flying	aircraft flying lower than 1000feet (333y/305m)
50.2	aircraft - low circling	aircraft circling lower than 1000 feet (333y/305m)

Appendix J1: Soundwatch Marine Wildlife Guideline and Law Incident Codes for Vessel Incident Observations (Page 1).

60.1	kayaks - spread out	kayaks not rafted up (spread loosely) when whales are present
60.2	kayaks - 100y/91m	kayaks paddling w/in 100y/91m of whales
60.3	kayaks - launching	kayaks launching into area when whales are present
60.4	kayaks - offshore 1/4m	kayaks paddling farther than 1/4 mile (440y/402m) offshore when whales are present
60.5	kayaks- parked on headland	kayaks parked on headland with whales present
60.6	kayak - 200y/183m	kayaks paddling w/in 200y/183m of whales NEW 2011 LAW
BOWRIDING		
20.1	bowriding - erratic	vessel operating in erratic fashion while engaged in bowriding
20.2	bowriding - deliberate	vessel deliberately attempting to have animal(s) bow/stern ride i.e. REPEATED CIRCLING
HAULOUT		
30.0	haulout - speed	vessel over 7 knots w/in 200y/183m of active haulout
31.2	haulout - no navigation restriction	vessel w/in 100y/91m of an active haulout - no navigation restriction
32.0	haulout - disturbance	vessel w/in 400y/366m of active haulout causing disturbance
32.1	haulout - disturb deliberate	any deliberate disturbance of active haulout
32.2	haulout - disturb maintain	disturbance with no attempt to move away from haulout
32.3	haulout - disturb but moved	disturbance but moved away
9.0	INTERACTION	swimming, feeding, touching wildlife DEFINE INTERACTIONS
10	Other: Define	something out of the ordinary or site specific DEFINE OTHER
8.0	TIME LIMIT	vessel is staying longer than 30 minutes w/in 1/4 Mi (440y/402m) of whales- record if only a few whales

Appendix J2: Soundwatch Marine Wildlife Guideline and Law Incident Codes for Vessel Incident Observations (Page 2).

Species code	Species Name	Latin Name
oror (SR)	killer whale - southern resident	Orcinus orca
oror (T)	killer whale - transients	Orcinus orca
oror (NR)	killer whale - northern resident	Orcinus orca
esro	gray whale	Eschrichtius robustus
meno	humpback whale	Megaptera novaeangliae
baac	minke whale	Balaenoptera acutorostrata
bamu	fin whale	Balaenoptera musculus
phph	harbour porpoise	Phocoena phocoena
phda	Dall's porpoise	Phocoena dalli
laob	Pacific white-sided dolphin	Lagenorhynchus obliquidens
phvi	harbour seal	Phoca vitulina richardsi
euju	Stellar's sea lion	Eumatopius jubatus
enlu	sea otter	Enhydra lutris
brma	marbled murrelet	Brachyramphus marmoratus
syau	ancient murrelet	Synthliboramphus antiquus
arhe	Pacific great blue heron	Ardea herodias fannini

Common Behaviors		
Spy Hop	Aerial scan	Breach
Half breach	Bellyflop	Pec slap
Pec wave	Inverted pec slap	Tail wave
Tail Slap	Inverted tail slap	Tail lift-headstank
Dorsal fin slap	Cartwheel	Chasing
Lunging/surging	Rolling at surface	High arch dives
Reverse	Push/lift/carry whale	Playing with log / object
Kelping	Fish seen	Vocalization heard
Bubble blowing	Synchronous surfacing	Mating
Penis seen-whale w/another	Penis seen-whale alone	Other-describe

Configuration	
Contact:	physical contact
Tight:	0 to 10m from another animal
Loose:	10 to 100m
Spread:	Greater than 100m

Orientation/Formation	
Flank:	side-to-side-to-side
Linear:	head-to-tail
Non-linear:	no particular orientation within group

Speed	
Motionless:	0 knots, "hanging", "logging"
Slow:	less than 2 knots, less smooth or "jerky" surfacing
Medium:	2-6 knots, slow roll, "normal"
Fast:	6-10 knots, fast roll
Porpoising:	greater than 10 knots, large portion of body out of water

Direction of travel	
N	North
NW	SouthWest
NE	NorthEast
E	East
S	South
SW	SouthWest
SE	SouthEast
W	West

Directionality	
Directional:	less than or equal to 90deg from previous direction of travel
Non-directional:	deviation of greater than 90deg from previous direction of travel

Appendix K1: Soundwatch Whale Survey & Behaviors Codes for Whale Scans (Page 1).

Species code	Species Name	Latin Name
oror (SR)	killer whale - southern resident	Orcinus orca
COOSE ALL THAT APPLY: J Jpartial K Kpartial L Lpartial List ID's if possible		
oror (T)	killer whale - transients	Orcinus orca
oror (NR)	killer whale - northern residents	Orcinus orca
esro	gray whale	Eschrichtius robustus
meno	humpback whale	Megaptera novaeangliae
baac	minke whale	Balaenoptera acutorostrata
phwi	harbour seal	Phoca vitulina richardsi

Common Behaviors/Overall Behavior State		
Spy Hop	Aerial scan	Breach
Half breach	Belly flop	Pec slap
Pec wave	Inverted pec slap	Tail wave
Tail Slap	Inverted tail slap	Tail lift-headstart
Dorsal fin slap	Cartwheel	Chasing
Lunging/surging	Rolling at surface	High arch dives
Reverse	Push/lift/carry whale	Playing with log / object
Keeping	Fish seen	Vocalization heard
Bubble blowing	Synchronous surfacing	Mating
Penis seen-whale w/another	Penis seen-whale alone	Milling
Tail-Lob	Sharking	Other-describe:
Fast Non-Directional	Long-dives	

Behavior States: TRAVEL REST MILL SOCIALIZE

Sea State	Effect of Combined Wind And Currents on Sea State
0	like a mirror (flat)
1	ripples form with the appearance of scales, but w/out foam crests
2	small wavelets, crests appear glassy, no breaking
3	larger wavelets begin to break, glassy foam, scattered white caps
4	small waves predominant but fairly frequent white caps
5	moderate waves, distinctly elongated, many white horses, chance of spray
6	long waves with extensive white foam breaking crests begin to form, spray likely
7	sea heaps up, white foam breaking waves start to be blown in streaks
8+	WHY THE HELL ARE BOATS STILL OUT THERE?

Configuration (Overall Group)	
Contact:	physical contact
Tight:	0 to 10m from another animal
Loose:	10 to 100m
Spread:	Greater than 100m <u>Spread in Groups:</u> Distinct sprd groups

Formation (Overall Group)	
Flank:	side-to-side-to-side
Linear:	head-to-tail
Non-linear:	no particular orientation within group

Speed	
Motionless:	0 knots, "hanging", "logging"
Slow:	less than 2 knots, less smooth or "jerky" surfacing
Medium:	2-6 knots, slow roll, "normal"
Fast:	6-10 knots, fast roll
Porpoising:	greater than 10 knots, large portion of body out of water

Direction of travel	
Directionality	
Directional:	less than or equal to 90deg from previous direction of travel
Non-directional:	deviation of greater than 90deg from previous direction of travel
N, NW, NE, E, S, SE, SW, W	

Weather & Abbrev.	
sunny	S
sunny w/ partial clouds	SPC
overcast - high	OCH
overcast	OC
foggy	FOG
rain - light	RL
rain - heavy	RH

Appendix K2: Soundwatch Whale Survey & Behaviors Codes for Whale Scans (Page 2).

Beaufort Scale	Mariner's Description	Wind Speed	Effect of Wind at Sea
0	calm	0-1	like a mirror (flat)
1	light air	1-3	ripples form with the appearance of scales, but w/out foam crests
2	light breeze	4-6	small wavelets, crests appear glassy, no breaking
3	gentle breeze	7-10	larger wavelets begin to break, glassy foam, scattered white caps
4	moderate breeze	11-16	small waves predominant but fairly frequent white caps
5	fresh breeze	17-21	moderate waves, distinctly elongated, many white horses, chance of spray
6	strong breeze	22-27	long waves with extensive white foam breaking crests begin to form, spray likely
7	moderate gale	28-33	sea heaps up, white foam breaking waves start to be blown in streaks, beginning of spindrift
8	fresh gale	34-40	
9	strong gale	41-47	
10	white gale	48-55	
11	storm	56-66	
12	hurricane	above 66	

Vessel Code	Description	Visibility	Weather
CA	Commercial Aircraft	none	sunny
EA	Ecotour aircraft	poor	sunny w/ partial clouds
EC	Ecotour Canadian	fair	overcast - high
EK	Ecotour Kayak	good	overcast
EU	Ecotour US	excel	foggy
PA	Private Aircraft		rain - light
PK	Private Kayak/Paddle		rain - heavy
PM	Private Motor		
PS	Private Sail		
MC	Marine Charter		
MF	Marine Fishing		
ML	Marine Tug with log barge		
MM	Marine Monitoring		
MQ	Marine Cruiseship		
MW	Marine Tug with tow		
MX	Marine Shipping		
MY	Marine Ferry		
GA	Government aircraft		
GB	Government BC Parks		
GC	Government Coast Guard		
GD	Government DFO		
GL	Government military		
GN	Government NOAA		
GO	Government		
GW	Government WDFW		
RP	Permitted Research		

Location	
Prominent Place Name	
Direction:	
N, NE, NW, E, S, SE, SW, W	
Distance:	
1/4 Mi, 1/2 Mi, 1 Mi, 2mi, 2+Mi	

Vessel activity	
W	Whale Oriented
F	Fishing
T	Transiting
R	Research (whale oriented)
E	Enforcement
A	Acoustic Range
O	Other with description

Appendix L: Soundwatch Marine Conditions & Vessel Codes for Vessel Counts.

Watching Whales in the Wild

Watching whales in the wild is a thrilling experience. The Salish Sea has some of the best whale watching from shore! Remember that our presence has an effect on all wildlife and their habitat.

Southern Resident orcas were listed as an Endangered Species in 2005

The three main threats to Southern Resident orcas are:

- 1. Prey availability:** Chinook salmon in this region are listed as endangered or threatened. They make up 80% of the Southern Resident orcas' diet. Limited prey availability is a result of the decline in salmon populations.
- 2. Contaminants:** Toxins in the ecosystem such as flame retardants (PBDEs), industrial products (PCBs) and pesticides (DDT) negatively affect their health and reproduction.
- 3. Vessel disturbance:** Includes human-made noise and acoustic signatures of all types of vessels (motorized vessels, including recreational boats, commercial whale watching, commercial fishing, tug boats, cargo ships, and military vessels; and non-motorized vessels, including kayaks, sail boats and paddle boards).





Vessel Disturbance Research

Did you know approximately 500,000 people visit San Juan Island every year and many of them by boat? Researchers have been working hard to determine the effect vessels have on killer whales.

Here are a few things you can do on the water while boating to reduce your impact:

- Reduce your speed to less than 7 knots within 1/2 mile of wildlife to minimize wake and underwater acoustic disturbance, pass slowly without stopping and avoid abrupt course changes.
- Maintain a distance greater than the State and Federal laws and turn your engine off when possible.


Research has shown that with an increase in ambient noise, killer whales increase the volume of their echolocation clicks and their communication calls to one another. All types of vessels (including non-motorized) have the potential to affect the whales' health, change their behavior, and increase their stress levels.

Watching Whales on San Juan Island

Lime Kiln Point State Park, San Juan County Land Bank West Side Preserve and Cattle Point Lighthouse & Interpretive Area are the best places to see orcas from land on San Juan Island. The Whale Museum has a research station in the Lime Kiln Lighthouse which is open to visitors in the summer months. There is also a year-round listening station connected to a hydrophone that streams underwater sounds live. If orcas are in the area, you just might hear them! To listen to the hydrophone live from anywhere in the world, visit www.seasound.org.

Stellar Wildlife Spots!



Be Whale Wise!

- Do not approach whales.
- Do not feed whales.
- Do not touch whales.
- Do not use binoculars or cameras to take pictures of whales.
- Do not use drones.
- Do not use firearms.
- Do not use alcohol.
- Do not use drugs.
- Do not use tobacco.
- Do not use illegal substances.
- Do not use illegal weapons.
- Do not use illegal explosives.
- Do not use illegal fireworks.
- Do not use illegal fireworks.

Stewardship Practices:

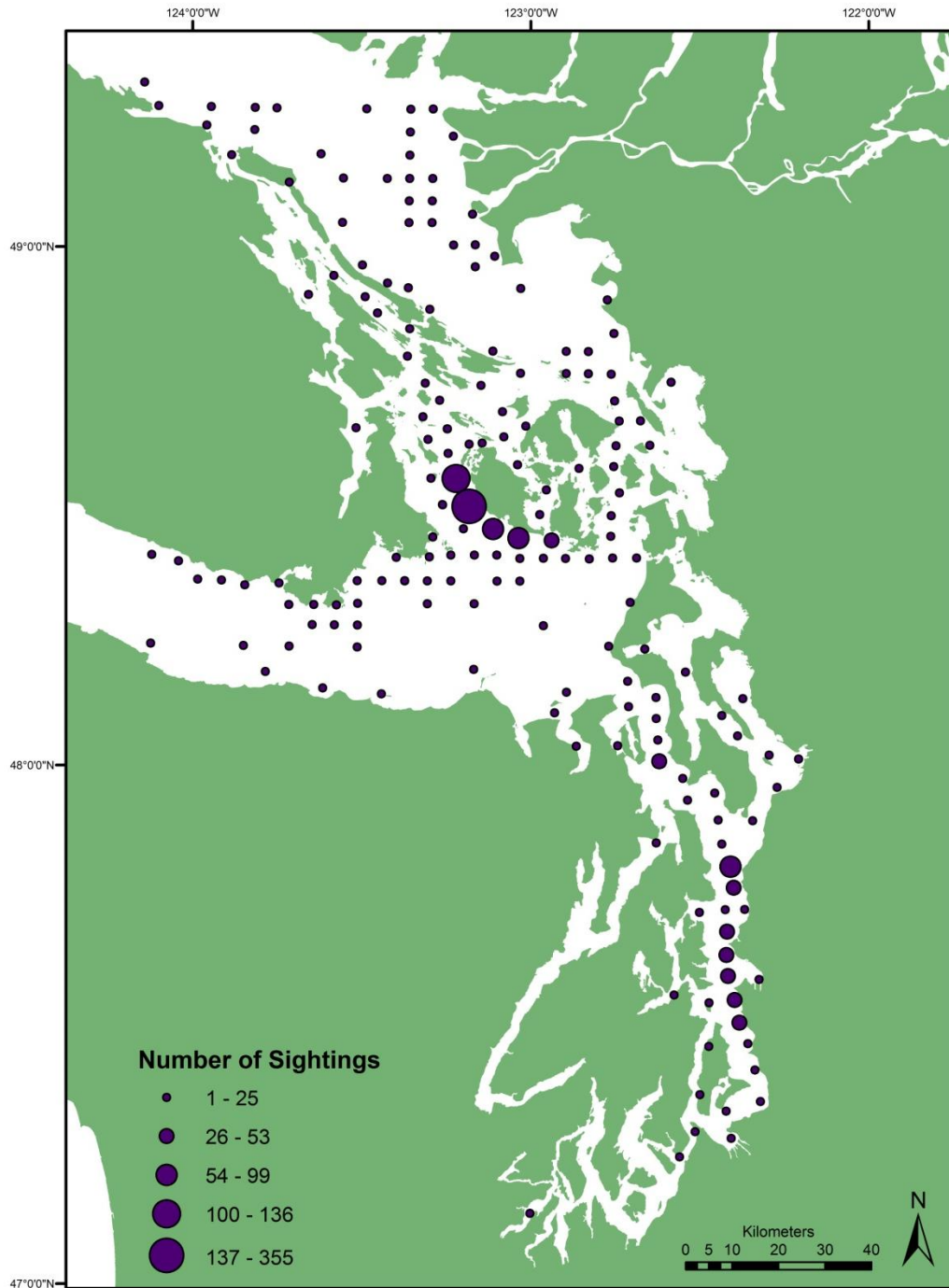
1. Follow Be Whale Wise Guidelines and Laws for Washington State and Canada. These apply to all types of vessels.
2. Drones (UAV): Is your drone registered? Did you know that it is illegal to fly a drone within a state or national park? The WA State killer whale law applies to drones.
3. Keep an eye on the weather! Sea conditions vary considerably. Did you check the tides and currents for the day? Do you have safety gear? Binoculars?

How you can help:

- Reduce, Reuse, Recycle and Compost!
- Unplug electronics and appliances. Turn off the lights!
- Decrease water usage (take shorter showers and turn off the faucet when brushing your teeth or washing dishes). Collect rainwater or plant a rain garden.
- Use environmentally-friendly cleaning products.
- Properly maintain your mode of transportation (vehicle, boat, motorcycle).
- Support killer whale conservation efforts!
- Report marine mammal sightings to The Whale Museum's Sightings Hotline (1-800-562-8832 or hotline@whalemuseum.org).
- Adopt an orca through The Whale Museum's Orca Adoption Program.
- Share your knowledge and help spread the word!

BeWhaleWise.org

Appendix M: The Whale Museum Watching Whales in the Wild Exhibit Hall Panels.



Appendix N: Map depicting the number of SRKW sightings reported by area in 2017. Its size is proportional to the number of reports in 2017.