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**Marine Mammal Aerial Surveys Conducted in the
Pacific Northwest, Inland Puget Sound Waters
30 August–4 September 2013
*Final Report***



Prepared for
Commander, U.S. Pacific Fleet, Pearl Harbor, Hawaii

Submitted to
**Naval Facilities Engineering
Command Northwest (NAVFAC NW)
Silverdale, WA 98315-1101**

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Cover Photo: Harbor porpoise (*Phocoena phocoena*) mother/calf pair photographed 1 September 2013 by M.A. Smultea under NMFS permit 15569.

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Acronyms and Abbreviations

AIC	Akaike's Information Criterion
Bf	Beaufort sea state
CDS	Conventional Distance Sampling
DoN	Department of the Navy
ESA	Endangered Species Act
ft	foot/feet
GPS	global positioning system
hr	hour(s)
ICMP	Integrated Comprehensive Monitoring Program
km	kilometer(s)
m	meter(s)
MMPA	Marine Mammal Protection Act
NAVFAC NW	Naval Facilities Engineering Command Northwest
nm	nautical mile(s)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NTR	Navy Technical Representative
NUWC	Naval Undersea Warfare Center
NWTRC	Northwest Training Range Complex
PSD	Perpendicular Sighting Distance
TO	Task Order
SOCAL	Southern California
SPUE	Sightings Per Unit Effort
SOW	Statement of Work
U.S.	United States

WAAS Wide Area Augmentation System

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1 Introduction

2 Contract # N62470-10-D-3011 was established specifically to support the United States (U.S.) Navy
3 in meeting regulatory requirements for monitoring under the Endangered Species Act (ESA) and
4 Marine Mammal Protection Act (MMPA) and to provide a mechanism to assist with the
5 coordination of program objectives under the Integrated Comprehensive Monitoring Program
6 (ICMP). The ICMP is intended for use as a planning tool to focus U.S. Navy monitoring priorities
7 pursuant to ESA and MMPA requirements (Department of the Navy [DoN] 2010).

8 The ICMP provides the overarching coordination that supports compilation of data from project-
9 specific monitoring plans, as well as U.S. Navy-funded research baseline and development studies.
10 The ICMP currently includes specific monitoring plans that have been or are being developed for
11 the various Fleet training ranges. Pursuant to the MMPA Final Rules published by the National
12 Marine Fisheries Service (NMFS) (50 CFR 216), the ICMP applies by regulation to those activities
13 on Navy training ranges for which the Navy sought and received incidental take authorizations.

14 The overall purpose of this Contract Task Order (TO) was to conduct marine mammal studies in
15 waters in or adjacent to three primary areas: (1) the U.S. Naval installations in the inland Puget
16 Sound Region, (2) offshore waters in the existing Northwest Training Range Complex (NWTRC)
17 and (3) offshore waters in the Naval Undersea Warfare Center (NUWC) Keyport Dabob Bay Range
18 Complex (together known as the Northwest Training and Testing Study Area). The Contract
19 included a TO to conduct line-transect aerial surveys to estimate densities of marine mammals in
20 Puget Sound waters described herein.

21 This report provides a summary of a line-transect aerial survey conducted in the Pacific
22 Northwest Inland Puget Sound waters from 30 August through 4 September 2013 as described in
23 the Statement of Work (SOW).

24 The primary objectives for this 2013 aerial survey were:

- 25 1. Collect data to estimate densities and abundance of marine mammals in the inland Puget
26 Sound waters for species with sufficient sightings.
- 27 2. Document the distribution and habitat use of each species observed.
- 28 3. Document and describe behaviors seen without performing focal follows.

29 Ten species of marine mammals previously reported in the study area include, but are not limited
30 to, the harbor porpoise (*Phocoena phocoena*), Dall's porpoise (*Phocoenoides dalli*), humpback
31 whale (*Megaptera novaeangliae*), minke whale (*Balaenoptera acutorostrata*), killer whale
32 (transient and resident, *Orcinus orca*), gray whale (*Eschrichtius robustus*), harbor seal (*Phoca
33 vitulina*), California sea lion (*Zalophus californianus*), Steller sea lion (*Eumetopias jubata*), and
34 northern elephant seal (*Mirounga angustirostris*). Three of these ten species were seen during the
35 fall 2013 aerial survey: the harbor porpoise, harbor seal, and California sea lion. In addition, two
36 rare sightings of Risso's dolphins (*Grampus griseus*) are reported herein.

37

1 Methods

2 Aerial Surveys

3 A Partenavia P68-C small high-wing, twin-engine aircraft operated by Aspen Helicopters, Inc.
4 (www.aspenhelicopters.com) out of Oxnard, California, was used to conduct the aerial survey.
5 This same company and aircraft have been used successfully during 18 U.S. Navy-funded line-
6 transect and behavior surveys of marine mammals in the Southern California (SOCAL) Range
7 Complex during 2008 - 2013 (e.g., Smultea and Bacon 2012). This aircraft was chosen due to the
8 survey team's familiarity with the company/pilots, as well as Aspen's proven reliability, extensive
9 experience (>30 years) conducting marine mammal surveys, safety record, and affordability. A
10 pre-flight notification was provided to the Navy Technical Representative (NTR) before the survey
11 as required in the SOW.

12 One pilot and four professionally trained marine mammal biologists (at least two with over 10
13 years of related experience) were aboard the aircraft. Two biologists served as observers in the
14 center seats of the aircraft looking through bubble windows on each side of the plane; the third
15 biologist observed through the belly window looking down beneath the plane behind the center
16 row of seats, and the fourth observer was the data recorder in the front right co-pilot seat. The
17 belly observer was positioned to ensure that no sightings were missed directly below the plane
18 "on" the survey line in order to meet line transect analysis assumptions (see paragraph below).
19 Surveys were flown at speeds of approximately 185 km/hr (100 knots) and a target altitude of 213
20 meters (m) (700 feet [ft]).

21 Established line-transect survey protocol was used (see Buckland et al. 2001) following systematic
22 survey lines planned with and pre-approved by the Naval Facilities Engineering Command
23 Northwest (NAVFAC NW) NTR. To maintain consistency, survey procedures were kept as similar
24 as possible to previous marine mammal aerial survey work conducted in the Puget Sound area
25 (Calambokidis et al. 1992; Laake et al. 1997; Osmek et al. 1996; Nysewander et al. 2005) and other
26 U.S. Navy ranges (e.g., Smultea and Mobley 2009; Smultea and Bacon 2012). The study area was
27 divided into eight survey blocks developed by the U.S. Navy in cooperation with NMFS (i.e.,
28 Admiralty Inlet, East Whidbey, South Whidbey, Hood Canal, Inshore Bainbridge, Seattle, Vashon,
29 and Southern Puget Sound). Parallel transect lines were positioned along an east-west
30 orientation, generally perpendicular to the bathymetric contours/coastline to avoid biasing of
31 surveys by following depth contours (**Appendix B, Figures 1 and 2**). Survey lines were spaced 3.7
32 kilometers (km) (2 nautical miles [nm]) apart. Final survey design was approved by the NTR.

33 A sighting was defined as one or more individual animals behaving similarly and/or in a
34 coordinated manner within an estimated 500 m of each other. The latter definition was
35 determined based on the common occurrence of aggregations of harbor porpoise occurring
36 within this distance of one another and to satisfy the assumptions of line transect theory.

37 Data Collection

38 We used customized *Mysticetus* Observation Platform software for data collection, including
39 basic sighting and environmental data (e.g., Beaufort sea state [Bf], observation effort type,
40 visibility, glare, cloud cover, etc.) (see Smultea and Bacon 2012 for definitions). Software was
41 loaded onto a touchscreen laptop PC for use in the field (this set up has also been used for the

1 U.S. Navy’s SOCAL aerial surveys since 2011 and other U.S. Navy range surveys). Each new entry
2 was automatically assigned a time stamp, a sequential sighting number, and a Wide Area
3 Augmentation System (WAAS)-enabled Global Positioning System (GPS) position. GPS locations
4 of the aircraft were automatically recorded at 10-second intervals on a WAAS-enabled Bluetooth
5 Global-Sat BT368i mini GPS and for redundancy/back up on a handheld Garmin 78S GPS and the
6 aircraft’s Garmin 296 GPS. Suunto handheld clinometers were used by the observers to measure
7 declination angles to sightings. If the sighting was not directly in line with (i.e., perpendicular to)
8 the right or left wing when the angle was taken, a bearing to that sighting was also recorded.
9 Declination angle and bearing were used in *Mysticetus* to calculate a sighting position.

10 A Canon EOS digital camera (e.g., Canon 7D) or a Nikon D-80 digital camera, with an Image
11 Stabilized 80-400 millimeter zoom lens, was used to photograph sightings when possible to
12 confirm species. A Sony Handycam HDR-XR55OV or a Sony Handycam HDR-PJ79OV video
13 camera was available onboard to document any unusual behaviors (although the video camera
14 was never used during this survey).

15 Observational and environmental data collected included:

- 16 1. Location and time of sighting (GPS) and distance of sighting from the trackline as
17 applicable (converted based on bearing and declination angle to the sighting from the
18 aircraft—see above)
- 19 2. Species identification of all marine mammal(s) or sea turtle(s) sighted (note that no sea
20 turtles were seen during the survey)
- 21 3. Number of individuals, group (i.e. sighting) size and/or composition
- 22 4. If present, number of calves observed and/or photographed
- 23 5. Duration of sighting
- 24 6. The best possible detailed description of behavior, disposition and reaction/no reaction to
25 the aircraft
- 26 7. Direction of travel (magnetic)
- 27 8. Photographs and/or video, if needed
- 28 9. Environmental information associated with each sighting event (e.g., Bf, percentage of
29 glare, percentage of cloud cover, etc.).

30 Environmental data were collected each time there was a change in effort type (systematic,
31 random, transit, circling [see **Appendix C, Table 1 for definitions**]) or environmental
32 conditions. Behavioral data were collected when a sighting was first made and included the first-
33 observed behavior state, heading, and minimum and maximum dispersal distances (estimated in
34 adult body lengths) between nearest neighbors within subgroups (see Smultea and Bacon 2012).
35 When sightings were circled, additional behavioral information was collected opportunistically.
36 However, extended focal follows were not conducted as the SOW indicated this approach was to
37 be used only for exceptionally unusual sightings or behavior.

38 **Photographs/Video**

39 When conditions allowed, photographs were taken opportunistically for species confirmation.
40 Photographs were taken through a small window on the plane’s copilot window or a rear window

1 on the left side of the plane. A digital video camera was available if needed as well. Observers
2 used internally stabilized Steiner 7 × 25 or Swarovski 10 × 32 binoculars if helpful to identify
3 species, number of individuals, behaviors, etc.

4 **Line-Transect Analysis**

5 We used conventional line-transect methods (also known as Conventional Distance Sampling or
6 CDS) to analyze the aerial survey data for estimating density and abundance of marine mammals
7 (Buckland et al. 2001). The survey data were filtered with the following criteria used to extract
8 data for the line-transect analyses to meet assumptions of line transect theory:

- 9 • Only data (e.g., sightings and effort) on systematic transect lines (data during transit and
10 connector effort were excluded).
- 11 • Only data collected in sea states Bf 0-2 (following protocol of Calambokidis et al., 1992;
12 Laake et al. 1997).

13 We did not use cloud cover to filter data, as Laake et al. (1997) did for harbor porpoise aerial
14 surveys, due to small sample sizes (filtering by percent cloud cover would have reduced them
15 even more, making robust estimation of the detection function impossible). Estimates of density
16 and abundance (and their associated coefficients of variation) were calculated using the following
17 standard formulae:

18

$$\hat{D} = \frac{n \hat{f}(0) \hat{E}(s)}{2 L \hat{g}(0)}$$

19
20

$$\hat{N} = \frac{n \hat{f}(0) \hat{E}(s) A}{2 L \hat{g}(0)}$$

21
22

23

$$CV = \sqrt{\frac{\text{var}(n)}{n^2} + \frac{\text{var}[\hat{f}(0)]}{[\hat{f}(0)]^2} + \frac{\text{var}[\hat{E}(s)]}{[\hat{E}(s)]^2} + \frac{\text{var}[\hat{g}(0)]}{[\hat{g}(0)]^2}}$$

24

25 where D = density (of individuals),
26 n = number of on-effort sightings,
27 f(0) = detection function evaluated at zero distance,
28 E(s) = expected average group size (using size-bias correction in DISTANCE),
29 L = length of transect lines surveyed on effort,
30 g(0) = trackline detection probability,
31 N = abundance,
32 A = size of the study area,
33 CV = coefficient of variation, and
34 var = variance.

35 Line-transect parameters were calculated for all marine mammal species identified at least 20
36 times after filtering data, using the software DISTANCE 6.0, Release 2 (Thomas et al. 2010). We

1 did not stratify estimates by sea state or other environmental parameters. We produced stratified
2 estimates of density and abundance for all eight survey strata, plus a global estimate (for all strata
3 pooled) for each species.

4
5 To avoid potential overestimation of group size, we calculated the size-bias-adjusted estimate of
6 average group size available in DISTANCE. To facilitate modeling, the largest 5 percent of the
7 perpendicular sighting distance (PSD) data were truncated. We modeled the data with the half-
8 normal (with hermite polynomial and cosine adjustments), hazard rate (with simple polynomial
9 and cosine adjustments), and uniform (with cosine adjustment) models. The model with the
10 lowest value of Akaike's Information Criterion (AIC) was selected for the final estimates.

11 Trackline detection probability could not be estimated from the data collected in this study due
12 to lack of independent observers. We therefore used values of $g(0)$ from previous surveys by
13 Laake et al. (1997) for harbor porpoise and Carretta et al. (2000) for harbor seals.

14
15 After filtering the data, there were a small number of sightings unidentified to species (e.g.,
16 unidentified marine mammal, as follows: $n=8$ unidentified porpoises, $n=2$ unidentified
17 pinnipeds). These were not used in the analyses, except that the two unidentified porpoise
18 sightings were assumed to be harbor porpoises and used in that analysis, since this is the only
19 porpoise species sighted in the study. Dall's porpoise is also present in some areas of Puget Sound
20 but was not sighted in this study.
21

22 Results

23 Effort

24 A total of 10 survey flights were completed on 6 days from 30 August through 4 September 2013 in
25 the Pacific Northwest inland Puget Sound waters. Each survey day consisted of two flights except
26 on 3 and 4 September when only one flight occurred due to unfavorable weather conditions (e.g.,
27 rain and fog). Morning flights were often curtailed by a heavy low marine fog layer (**Appendix C,**
28 **Table 2**), which delayed the start of surveys until it had subsided. A total of 34 hours (hr) or 5,785
29 km (3,124 nm) of flight (i.e., "in air") time from "wheels up" to "wheels down" was flown over the 6
30 survey days. An additional 11 hr was used to ferry the aircraft back and forth from Oxnard,
31 California, to Auburn, Washington, plus approximately 1.5 hr of "engines-on" time on the runway
32 (i.e., waiting in line to take off from the Auburn Airport) (**Appendix C, Table 2**).

33 Observers actively searched for marine mammals during 92 percent (31.3 hr) of the total 34 hr of
34 flight time; the remaining 8 percent of time was over land in transit from the airport or over tidal
35 flats and islands (**Appendix C, Table 2**). The total hours and flight descriptions for each day by
36 date are listed in **Appendix C, Table 2**.

37 Sightings and Relative Occurrence

38 A total of 779 sightings of an estimated 1,716 total individual marine mammals were made. Four
39 species were documented over the six survey days in descending order of frequency: harbor seal,
40 harbor porpoise, California sea lion and Risso's dolphin (**Appendix C, Table 3**). Harbor seals
41 comprised 87 percent of all 779 individuals observed, followed by harbor porpoises (9 percent)

(Appendix B, Figures 3 and 4). Appendix C, Table 4 lists all marine mammal sightings and their GPS locations. Appendix C, Table 5 summarizes sightings by subregion.

Sightings (i.e., number of groups) per unit effort (SPUE) was highest for harbor seals (1.7 groups/km flown) followed by harbor porpoises and California sea lions (these are approximate, as they include all effort types [e.g., transit, circling, systematic] and all Bf) (Appendix C, Table 6). The predominant Bf was 1 (46 percent) followed by Bf 3 (21 percent) based on the total 3001 km of all observation effort during all leg types (Appendix B, Figure 5 and Appendix C, Table 7). This was followed by Bf 2 (18 percent), Bf 0 (13 percent) and Bf 4 (2 percent).

Results of this aerial survey are consistent with recent reported trends but differ somewhat from studies conducted approximately 10–14 years prior. Although some of the differences may be attributable to different study areas and/or survey timing, purpose, and/or infrequency of species, they are considered noteworthy as summarized below.

1. The harbor porpoise had been virtually absent in the Puget Sound Basin and Hood Canal since the 1940s, when they were considered common (Scheffer and Slipp 1948; Osmek et al. 1996; Calambokidis et al. 2011). However, our results support recent trends of increasing numbers in the region. We saw harbor porpoises on all six survey days from 30 August to 4 September 2014. Sightings included 9 groups in southern Puget Sound and 17 in central Puget Sound (Appendix B, Figure 3 and Appendix C, Tables 8 and 9). During 2009–2013, visual and passive acoustic studies documented year-round harbor porpoise presence in northern Puget Sound at Burrows Pass near Anacortes, Washington (Jeffries 2011, 2012, 2014). Although individuals were detected daily (Jeffries 2012), highest detection rates occurred in winter (Jeffries 2014). In addition, acoustic detections of vocalizing harbor porpoises were higher at night than during the day (Jeffries 2012). During summer, the average observed group size of harbor porpoises was $\bar{X} = 5$ with large groups of approximately 50 individuals regularly observed in Rosario Strait (Jeffries 2012, 2014). In comparison, mean observed group size during our 2013 summer survey was 2.2 individuals based on the total 66 groups observed, with a maximum group size of 10. Notably, the Burrows Pass study area is located north and outside of our 2013 aerial survey project area.
2. Harbor seals were sighted about 10 times more frequently than harbor porpoises during the survey; this is consistent with other relatively recent research in the region (A. Jeffries, pers. comm, October 2013, Jeffries 2011).
3. No Pacific white-sided dolphins were sighted during the survey, supporting their reported intermittent occurrence in central and southern Puget Sound. However, they are known to occur regularly in some of the more northern inshore waters of British Columbia (Stacey and Baird 1991; Rechsteiner 2012; Rechsteiner et al. 2013). Notably, over 1,000 were seen in Georgia Strait in early November 2012 and lower numbers have been reported year-round in Puget Sound on occasion (A. Jeffries, pers. comm., October 2013). This indicates that this species is present intermittently but can occur in large group numbers on rare occasions (A. Jeffries, pers. comm, October 2013).
4. Although the Dall’s porpoise is noted as a common species in Puget Sound (Jefferson et al. 2008), none were sighted during our survey. Dall’s porpoises were not seen in Burrows Pass near Anacortes during surveys from 2009–2013 (Jeffries 2012).
5. No gray, minke, or humpback whales were seen. Their occurrence is considered uncommon in central and southern Puget Sound, although minke are seasonally common during summer in the more northern San Juan Islands (Dorsey et al. 1990; Jefferson et al. 2008).

Comment [CB1]: Will get this to you later today or tomorrow.

- 1 6. Two ecotypes of killer whales (transient and Southern resident populations) frequent the
2 waters of Puget Sound; however, we did not observe any killer whales. These two
3 populations often share the same range but are not believed to intermix (Jefferson et al.
4 2008). Southern resident killer whales are seen in northern and central Puget Sound
5 occasionally during the winter months and in spring, summer, and fall in the San Juan
6 Islands and the Strait of Juan de Fuca, British Columbia (Hanson et al. 2010; Holt et al.
7 2012). They are rarely seen in southern Puget Sound. Transient killer whales are
8 occasional visitors to the inland waters of the Puget Sound during all seasons of the year
9 (Wiles 2004).

10
11 Rare or unusual sightings consisted of two separate encounters with a pair of Risso's dolphins
12 (*Grampus griseus*):

- 13 1. We sighted a pair of Risso's dolphins on 31 August 2013 approximately 2.7 km east of Blake
14 Island and 3.4 km west of West Seattle (**Appendix B, Figure 6 and Appendix C, Table**
15 **10**). No photographs were taken during this sighting because the animals were only seen
16 once briefly just below the water surface.
- 17 2. We again saw a pair of Risso's dolphins four days later on 4 September 2013 approximately
18 3.6 km west of Shoreline, Washington (**Appendix B, Figure 6 and Appendix C, Table**
19 **10**). Photographs were taken during this sighting (**Appendix A, Photo 1**). These photos
20 were provided by the Navy to biologists interested in attempting to match them to photos
21 taken of Risso's dolphins in Puget Sound in earlier years. Photographs were not taken of
22 the 31 August pair of Risso's dolphin so we are unable to compare them to this sighting to
23 see if they were the same pair.

24 Although sightings of Risso's dolphins in Puget Sound are quite rare (C. Emmons, pers.
25 comm., 14 July 2012; Jefferson et al. 2014), a pair of Risso's has been seen there
26 intermittently since 2011. On 30 December 2011 a Risso's dolphin pair was seen at the
27 entrance of Eld Inlet near Olympia (southern Puget Sound) and photographs were sent to
28 Cascadia Research Collective. On July 4, 2012, a pair was observed between Lagoon Point
29 and Marrow Stone Island (south Puget Sound). On 13 July 2012, a pair was seen near
30 Colvos Pass near Gig Harbor, also southern Puget Sound. To our knowledge, it has not
31 been confirmed whether these sightings are the same two Risso's dolphins or not.

32 Pinnipeds in Water and Hauled Out

33 Most (95 percent) of the total 694 individual pinnipeds were seen in water, with the remaining 5
34 percent seen hauled out on tidal/mud flats, sand bars, buoys, rocks/logs or the shore (**Appendix**
35 **C, Table 11**). California sea lions were observed hauled out more frequently than harbor seals: 26
36 percent of 15 individuals versus 4 percent of 674, respectively. Even though these animals may
37 have been seen during systematic line-transect effort, hauled-out sightings were not used for in-
38 water density estimation purposes because they were completely out of the water. However,
39 pinnipeds with their belly resting on sand but still in the water were included for in-water density
40 estimates.

41 Sightings within Survey Subregions

42 The number of sightings by species was stratified by the eight survey subregions identified in the
43 SOW. Overall, marine mammal sightings were most frequent (35 percent or 275 groups) in the

1 Southern Puget Sound subregion, followed by Hood Canal (17 percent or $n=130$), East Whidbey (14
2 percent or $n=106$), Vashon (11 percent or $n=87$), Admiralty Inlet (9 percent or $n=68$), Seattle (7
3 percent or $n=55$), South Whidbey (6 percent or $n=44$), and Bainbridge (1 percent or $n=14$)
4 (**Appendix B, Figure 7 and Appendix C, Table 5**).

5 Harbor porpoises were most frequently seen in Admiralty Inlet (29 percent or 19 groups), followed
6 by Seattle and South Whidbey (21 percent or $n=14$ each, respectively), and Southern Puget Sound
7 (14 percent or $n=9$). There were very few sightings in Hood Canal (6 percent or $n=4$), East
8 Whidbey (5 percent or $n=3$) and Vashon (3 percent or $n=2$). There were no harbor porpoise
9 sightings in the Bainbridge, South Whidbey or Vashon survey areas (**Appendix B, Figure 3 and**
10 **Appendix C, Tables 8 and 9**). The number of harbor porpoises we observed in East Whidbey
11 was considered relatively low by another biologist conducting passive acoustic surveys of this
12 species in the Puget Sound region, possibly attributable to individual porpoise moving as a loose
13 aggregation rather than a cohesive group (A. Jeffries, pers. comm. Oct 2013).

14 Harbor seals were most frequently seen in the Southern Puget Sound subregion (39 percent or
15 260 groups), followed by Hood Canal (18 percent or $n=121$), East Whidbey (15 percent or $n=100$),
16 Vashon (12 percent or $n=79$), Admiralty Inlet (7 percent or $n=45$), South Whidbey (4 percent or
17 $n=29$), Seattle (4 percent or $n=27$), and Bainbridge (1 percent or $n=14$) (**Appendix B, Figure 5 and**
18 **Appendix C, Table 12**). Harbor seals are the most common and widely distributed pinniped in
19 Washington coastal waters (Huggins et al. 2013). Their populations there are thought to be at or
20 near carrying capacity (Gaydos et al. 2013).

21 Other Species Sightings

22 In addition to marine mammal sightings, opportunistic sightings of other in-water, non-marine
23 mammals were recorded (excluding birds). Minimal information was recorded for these sightings
24 to avoid compromising effort focused on searching for marine mammals. Thus, observers did not
25 report all such sightings consistently. However, they are reported herein to document their
26 occurrence opportunistically. (Notably, the latter sightings are excluded from the overall sighting
27 counts for marine mammals reported here).

28 No sea turtles were seen. Twenty-one fish schools (possibly salmon) were sighted, swimming in a
29 typically close coordinated manner in the same direction (see **Appendix C, Table 13**). Other
30 non-marine mammal sightings included one shark and numerous jellyfish (counts were not made
31 of the jellyfish). Red-colored plankton (probably the marine-dwelling species of dinoflagellates,
32 *Noctiluca* sp.; <http://www.ecy.wa.gov/news/2013/131.html>) was seen on many of the survey days
33 in a number of the different subregions, but particularly in southern Puget Sound. Other
34 brownish and yellowish-colored apparent plankton blooms were also commonly seen. Photos
35 were taken of these colored waters on several occasions.

36 Photography

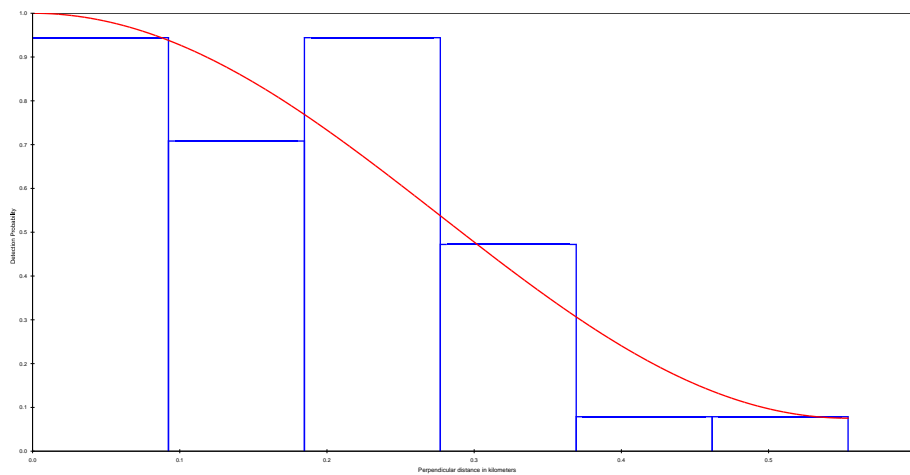
37 Five-hundred digital photographs were taken during the aerial survey period. As indicated
38 previously, photographs were taken primarily of unusual/rare sightings and initially unidentified
39 or unconfirmed species to confirm or verify species as possible (see Methods section above).
40 Species photographed during the survey were the harbor porpoise, Risso's dolphin, harbor seal,
41 and California sea lion.

1 No video was taken during the survey period.

2 **Density and Abundance**

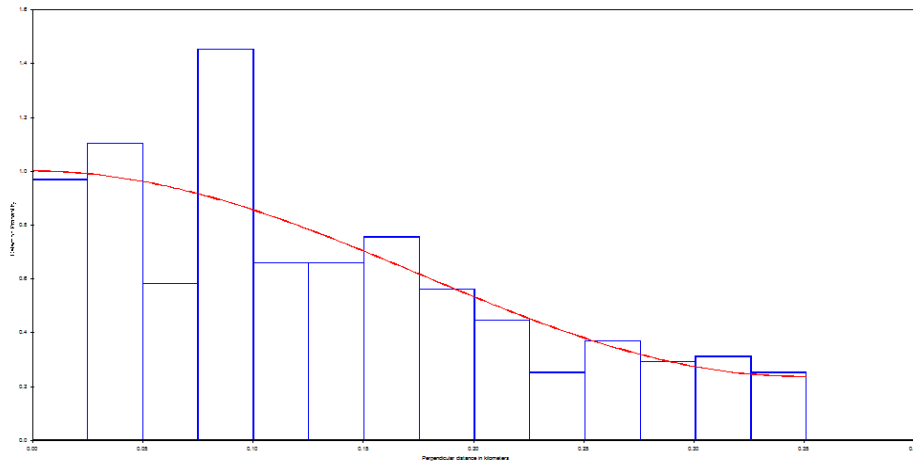
3 Four marine mammal species were identified during the surveys: harbor porpoise (n=41 after
4 filtering), harbor seal (n=471 after filtering), California sea lion (n=4 after filtering), and Risso's
5 dolphin (n=0 after filtering). Estimates of density and abundance were only made for harbor
6 porpoises and harbor seals. PSD histograms and fitted detection functions for these two species
7 are shown in **Figures 1 and 2**. Results of the line transect analyses are presented in **Table 1**
8 below.

9



10 **Figure 1. Harbor porpoise Perpendicular Sighting Distance histogram and fitted**
11 **detection function.**

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Figure 2. Harbor seal Perpendicular Sighting Distance histogram and fitted detection function.

Table 1. Line-transect parameters and estimates of density and abundance for Puget Sound marine mammals.

Species	Stratum	No. Stgs.*	Effort (km)	Avg. Group Size	Trackline Detection Prob. - g(0)	Individual Density (#/100 km ²)	95% CI (Density)	Abundance	95% CI (Abundance)	% CV
Harbor Porpoise	Admiralty Inlet	10	121.5	2.4	0.29 [#]	1.1469	0.539-2.442	292	137-623	36
	Bainbridge	0	61.1	1.0	0.29 [#]	0	n/a	0	n/a	n/a
	East Whidbey	2	298.1	1.0	0.29 [#]	0.0386	0.014-0.110	24	26-573	35
	Hood Canal	3	227.9	1.0	0.29 [#]	0.0757	0.028-0.206	31	30-225	38
	Seattle	10	145.9	1.1	0.29 [#]	0.4281	0.059-3.091	89	14-654	83
	South Whidbey	8	121.3	1.2	0.29 [#]	0.4654	0.231-0.934	123	62-250	28
	Southern Puget Sound	8	323.9	1.6	0.29 [#]	0.2204	0.115-0.422	99	51-192	29
	Vashon	0	340.7	1.0	0.29 [#]	0	n/a	0	n/a	n/a
	<i>Pooled</i>	<i>41</i>	<i>1640.4</i>	<i>1.3</i>	<i>0.29[#]</i>	<i>0.2513</i>	<i>0.162-0.389</i>	<i>664</i>	<i>428-1027</i>	<i>21</i>
	Harbor Seal	Admiralty Inlet	23	121.5	1.5	0.28 [^]	2.3064	1.267-4.198	587	324-1071
Bainbridge		8	61.1	2.4	0.28 [^]	2.5676	0.849-7.765	242	78-730	52
East Whidbey		61	298.1	1.4	0.28 [^]	2.3474	0.717-7.687	1516	463-4964	40
Hood Canal		81	227.9	1.3	0.28 [^]	3.6776	2.143-6.312	1438	836-2470	21
Seattle		16	145.9	1.0	0.28 [^]	0.8999	0.327-2.477	189	68-523	38
South Whidbey		20	121.3	2.6	0.28 [^]	3.5497	1.322-9.531	950	352-2552	47
Southern Puget Sound		192	323.9	1.4	0.28 [^]	6.9413	3.289-14.650	3164	1498-6676	28
Vashon		46	340.7	1.6	0.28 [^]	1.7874	1.176-2.717	566	374-861	18
<i>Pooled</i>		<i>447</i>	<i>1640.4</i>	<i>1.7</i>	<i>0.28[^]</i>	<i>3.2813</i>	<i>2.399-4.488</i>	<i>8655</i>	<i>6327-11836</i>	<i>15</i>

*Before truncation.

**Effort here is limited to systematic line-transect observation effort filtered by the conditions described in the Methods section.

Comment [CB2]: Can formatting fix this so that it is one line?

#From Laake et al. (1997)

^From Carretta et al. (2000)

1

1 Specific estimates of abundance of harbor porpoises in the various survey subregions ranged from
2 zero to 292 porpoises. The highest abundance for any survey subarea was Admiralty Inlet, with
3 an estimated 292 porpoises (CV = 36%). The overall pooled estimate of abundance for harbor
4 porpoises in the entire study area was 664 porpoises (CV = 21%).

5 Specific estimates of abundance of harbor seals in the various survey subareas ranged from 189 to
6 3,164 seals. The highest abundance for any survey subarea was Southern Puget Sound, with an
7 estimated 3,164 seals (CV = 28%). The overall pooled estimate of abundance for harbor seals in
8 the entire study area was 8,655 seals (CV = 15%).

9 **Summary of First-Observed Behavioral Analyses**

10 The purpose of first-observed behavior analyses was to describe and quantify selected behavioral
11 parameters of marine mammal species occurring in the survey area during the study (**Appendix**
12 **C, Table 14**). This approach follows methods described in Smultea and Bacon (2012) and Smultea
13 and Mobley (2009) for aerial surveys conducted in the Southern California Bight and Hawaii,
14 respectively. These “first observed” parameters have been found to be significantly influenced by
15 a number of environmental and other explanatory variables such as season, time of day, group
16 size, and calf presence among marine mammal species (Smultea and Bacon 2012). These variables
17 have also been shown to be sensitive among a number of marine mammal species to stimuli such
18 as predators and other potential perceived or real threats including whaling activities, tour and
19 other vessels, oil spills, in-water human swims, exposure to underwater sounds (e.g., seismic and
20 sonar sounds, icebreaking sounds), etc. (e.g., summarized in Richardson et al. 1995; see also
21 Patenaude et al. 2002, Smultea and Würsig 1995, Southall et al. 2007, Smultea et al. 2008, 2014).
22 Thus, they were summarized herein, as very little is known about these behavioral parameters for
23 the species observed during our surveys, particularly in central and southern Puget Sound. These
24 parameters were:

- 25 • Group size,
- 26 • Travel direction (compass heading),
- 27 • Maximum dispersal (in estimated adult body lengths) (i.e., maximum distance between
28 nearest neighbors within a group), and
- 29 • Behavior state.

30
31 Two species or species groups were deemed to have adequate sample sizes ($n > 20$) to provide
32 meaningful summary statistics: the harbor porpoise and harbor seal (**Appendix C, Table 15**).
33 Notable comparisons and trends are summarized below.

- 34 1. Although mean group size was the same for both harbor porpoises (2.2 ± 1.96) and harbor
35 seals (2.2 ± 8.36), though there was considerably more variation in group size among
36 harbor seals (**Appendix B, Figure 8**).
- 37 2. Mean maximum dispersal distance for the harbor porpoise ($4.1 \text{ BL} \pm 9.38$) was
38 tighter/closer than the harbor seals (in-water sightings only) ($6.4 \text{ BL} \pm 9.52$); however, for
39 both species, there was considerable variation.
- 40 3. Overall, travel was the most frequently observed behavior state for both species: 85
41 percent of 604 harbor seal groups and 84 percent of 50 harbor porpoise groups were first
42 observed traveling in point-to-point movement.

- 1 4. Mill behavior was uncommon for both species, but was twice as common among harbor
2 porpoises (16 percent or 8 groups) compared to harbor seals (7 percent of 604 groups).
3 Mill behavior was defined as at least 50 percent of individuals within a group observed
4 with different headings/orientations, following Smultea and Bacon (2012).

5
6 Note that this is the first time of which we are aware that these parameters (other than group
7 size) have been summarized for harbor porpoises and harbor seals as observed in the water
8 from an aircraft.
9

10 **Acknowledgments**

11 We are grateful to U.S. Navy personnel Andrea Balla-Holden (Naval Facilities Engineering
12 Command Northwest), for her support, coordination, and facilitation in implementing this
13 marine mammal and sea turtle aerial monitoring. Thanks to field personnel Mark Deakos,
14 Vanessa James, Meggie Moore, and Dave Steckler. Special thanks to our excellent and safe Aspen
15 pilot, Barry Hansen, and Aspen's manager, Rick Throckmorton. A special thanks to Kristen
16 Ampela for her assistance during the survey period and in reviewing this report. Photographs
17 were taken under NMFS Permits 14451 and 15569.

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- 30

1 **APPENDIX A: PHOTOGRAPHS**
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5 **Photo 1. Risso's dolphin pair photographed ~ 4 km west of Shoreline, WA, 4 September**
6 **2013 by V. James under NMFS permit 14451.**



7
8 **Photo 2. Harbor seal mother/pup pair photographed 1 September 2013 by M. Smultea**
9 **under NMFS permit 15569.**



1
2 **Photo 3. Harbor porpoise mother/calf pair photographed 1 September 2013 by M. Smultea**
3 **under NMFS permit 15569.**



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5 **Photo 4. Harbor porpoise mother/calf pair photographed 30 August 2013 by D. Steckler**
6 **under NMFS permit 15569.**

APPENDIX B: FIGURES

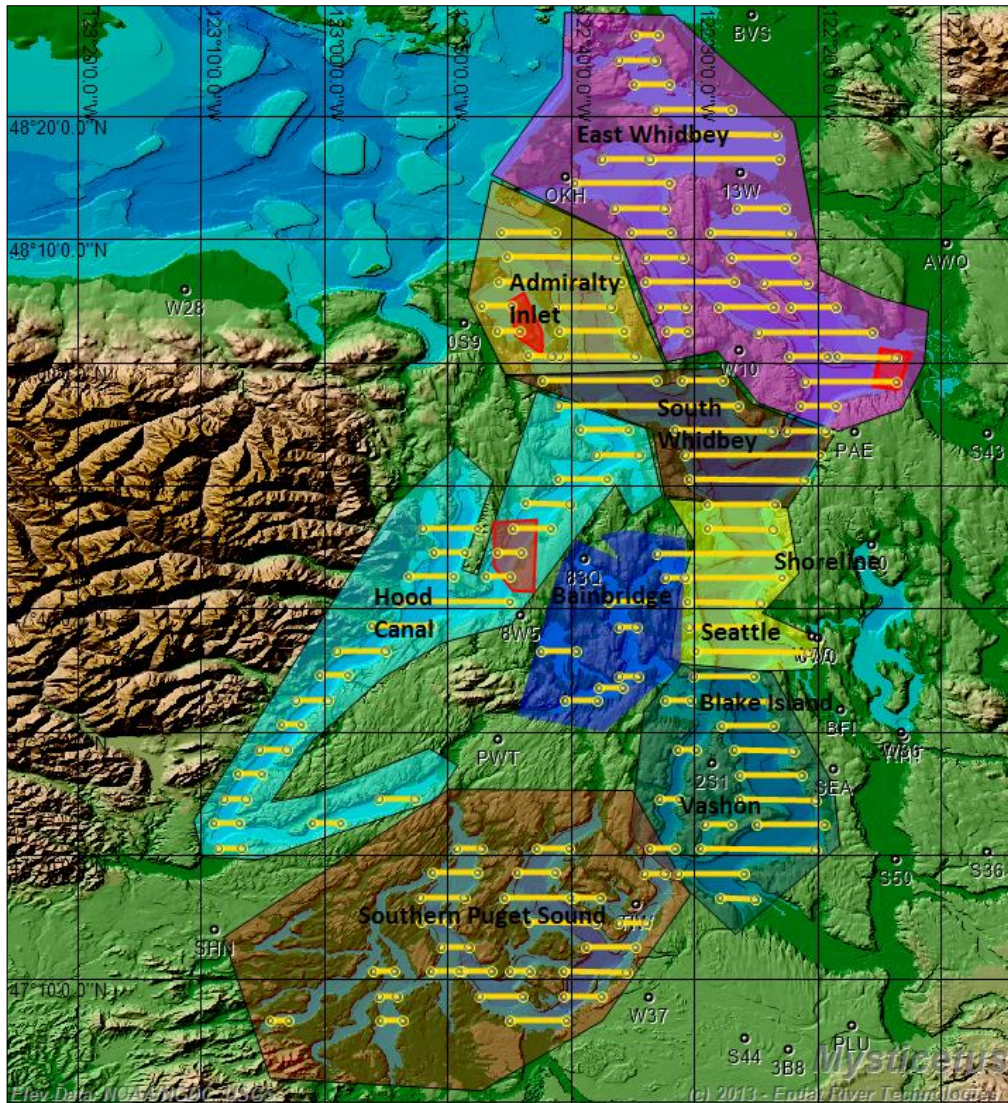
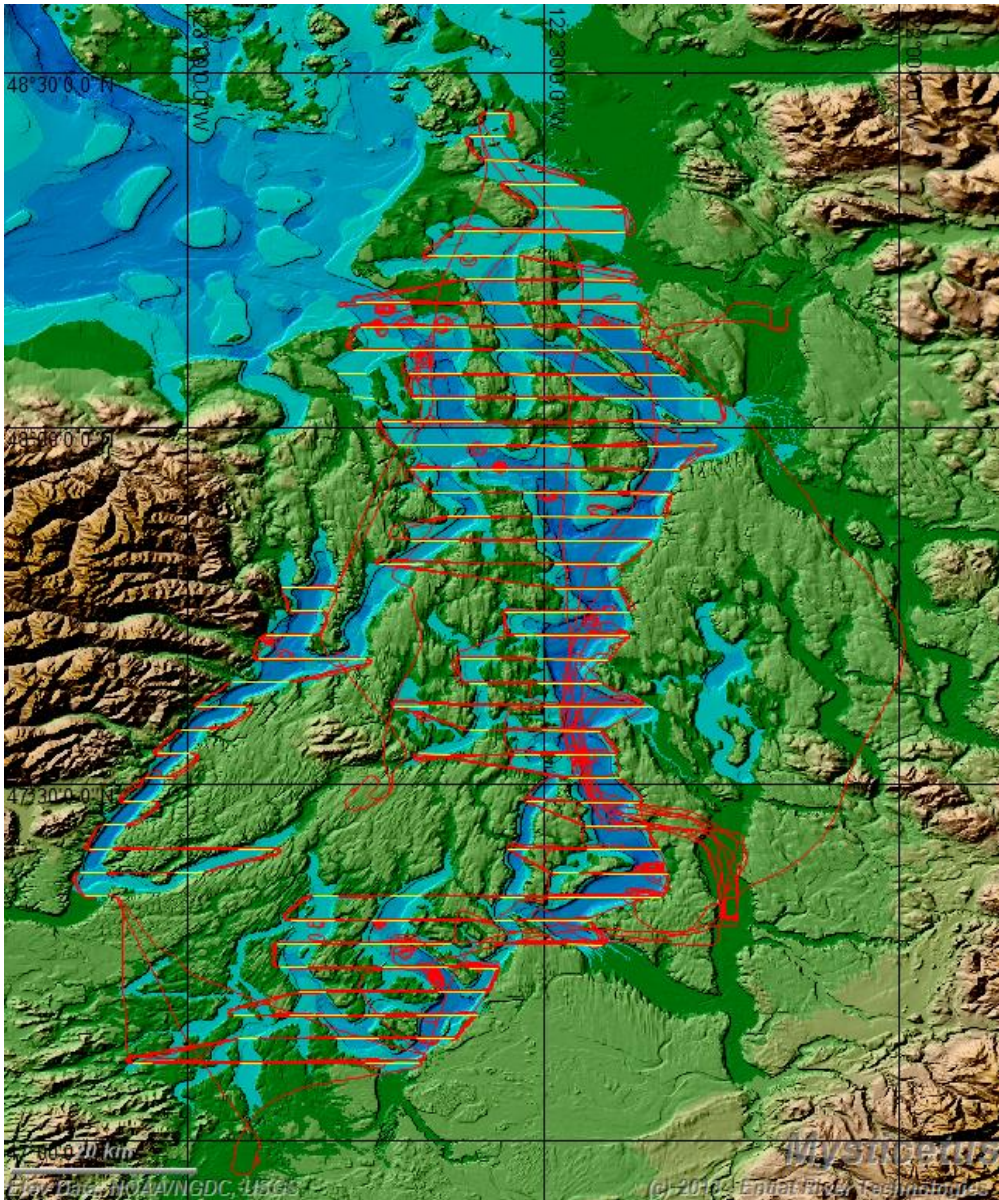


Figure 1. Pre-determined survey tracklines (yellow lines) within the Pacific Northwest Inland Puget Sound Waters study area 2013. The shaded polygons delineate the primary study area subregions.

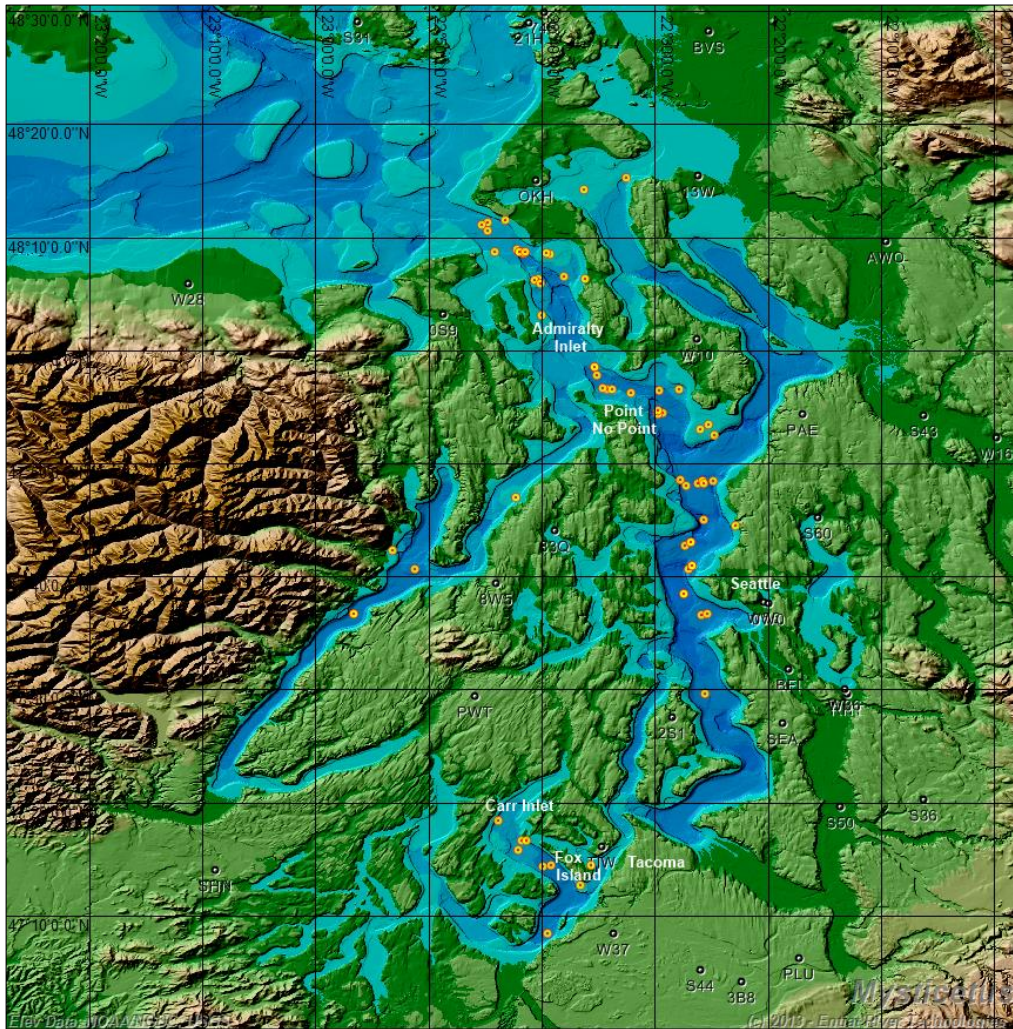


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15 **Figure 2. All tracklines completed during 30 August–4 September 2013 aerial survey**
16 **monitoring in Puget Sound for the U.S. Navy.**

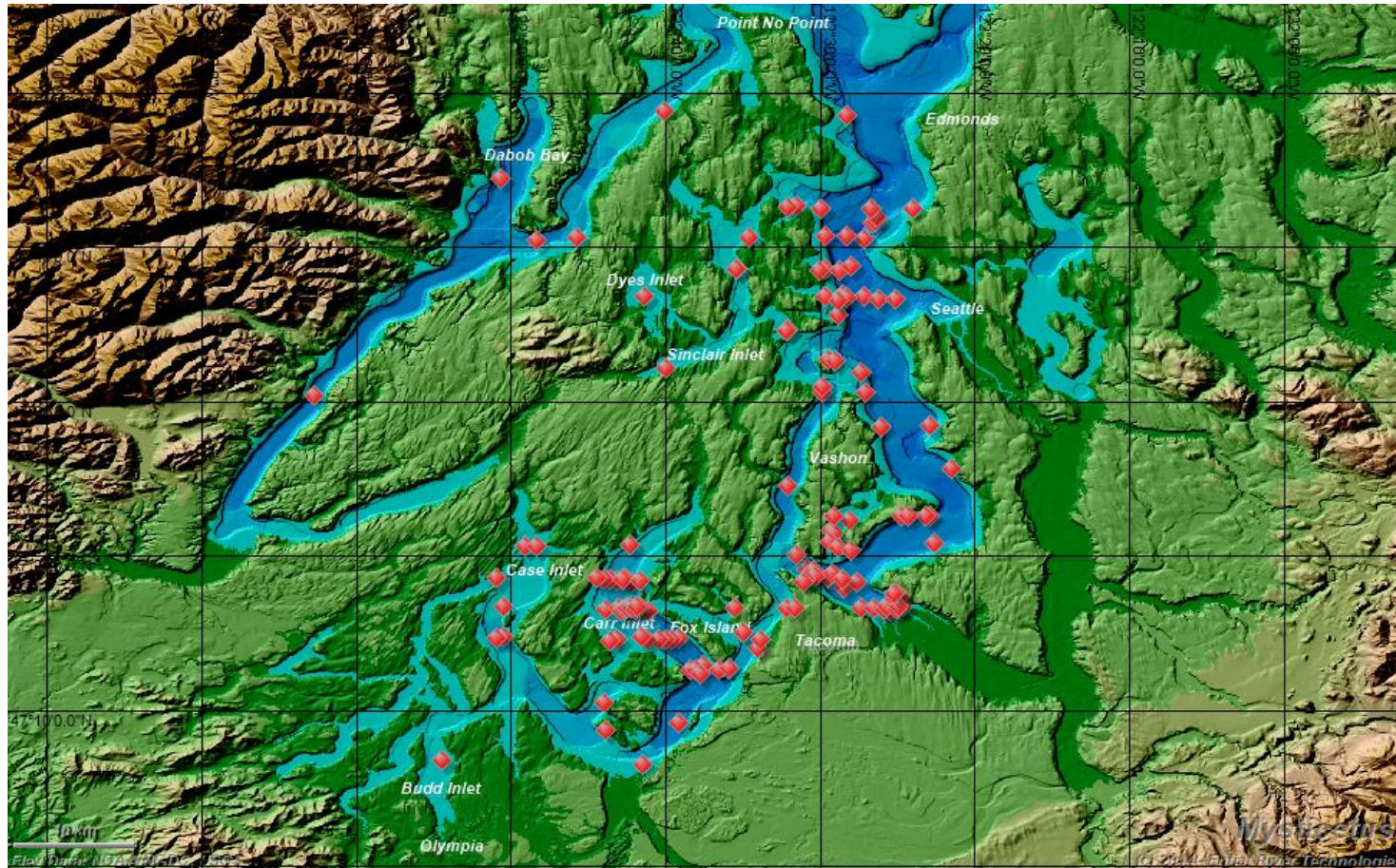
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20 **Figure 3. Locations of harbor porpoise sightings made during 30 August–4 September 2013**
21 **aerial survey monitoring in Puget Sound for the U.S. Navy.**

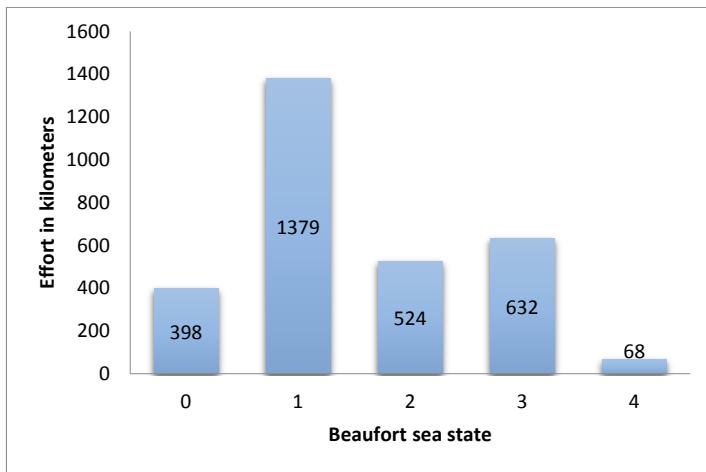
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31 Figure 4. Locations of harbor seal sightings made during 30 August –4 September 2013 aerial survey monitoring in Puget Sound
32 for the U.S. Navy.

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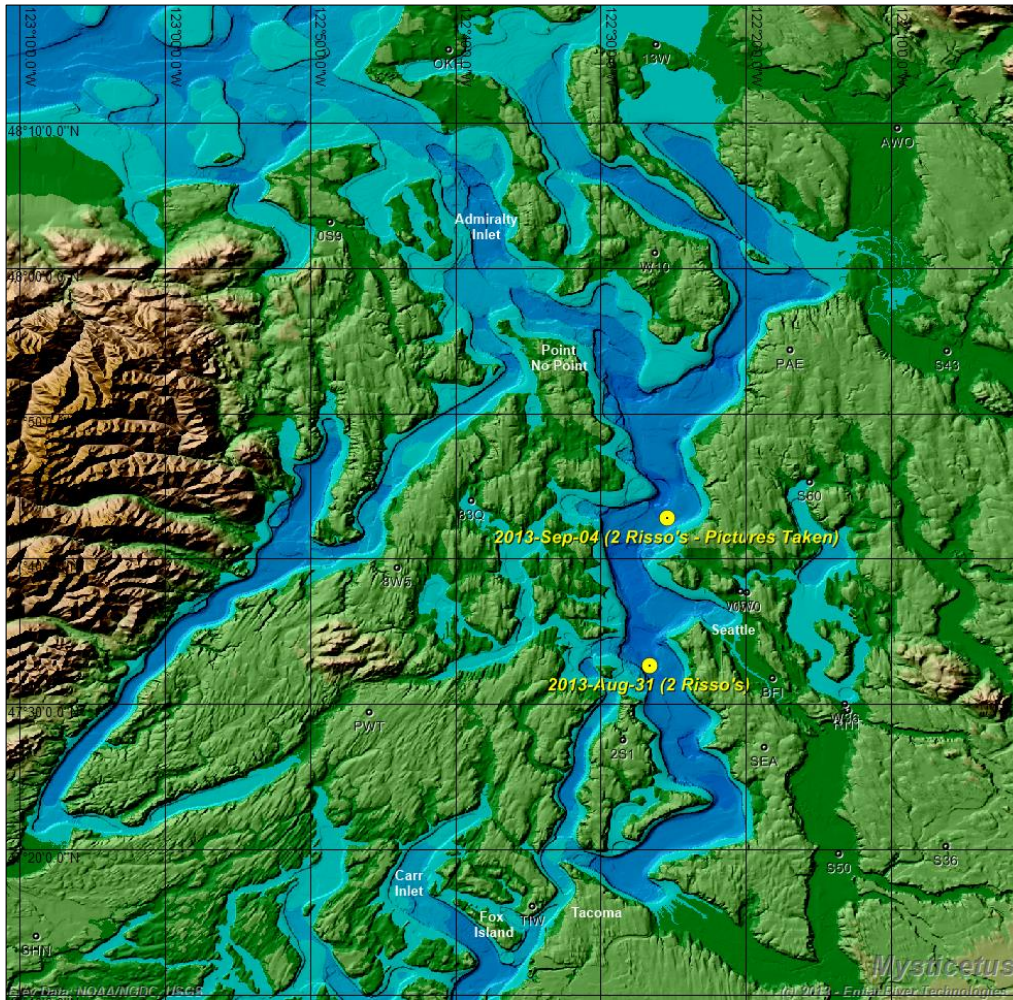
35 **Figure 5. Number of kilometers of all flight effort by Beaufort sea state during Puget**
36 **Sound Marine Mammal Aerial Surveys 30 August–4 September 2013.**

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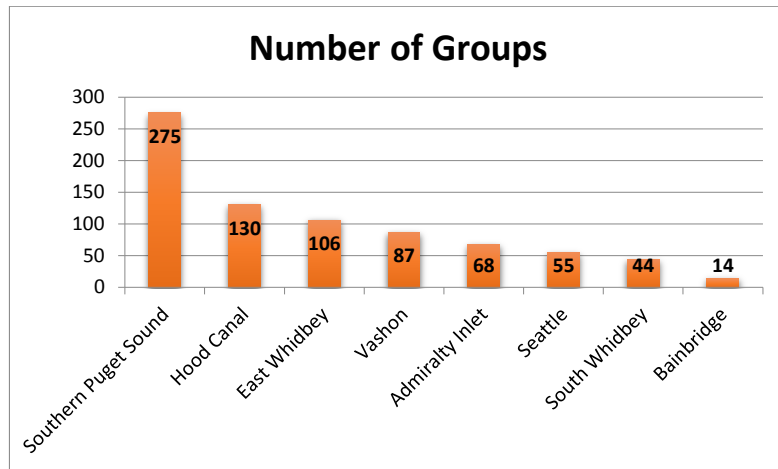
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42 **Figure 6. Locations of Risso's dolphin sightings made during 30 August –4 September 2013**
43 **aerial survey monitoring in Puget Sound for the U.S. Navy.**

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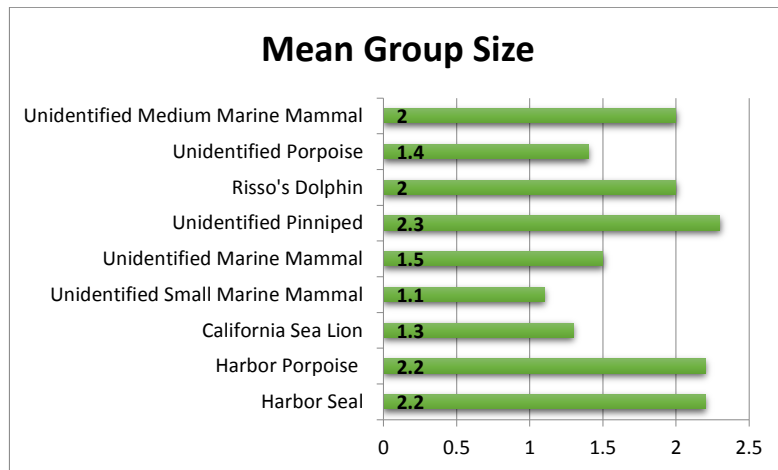


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51 **Figure 7. Number of groups seen in each subregion during Puget Sound Marine Mammal**
52 **Aerial Surveys 30 August–4 September 2013.**

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56 **Figure 8. Mean group size of sightings during Puget Sound Marine Mammal Aerial**
57 **Surveys 30 August–4 September 2013.**

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APPENDIX C: TABLES

Table A-1. Definitions of leg types flown during Puget Sound Marine Mammal Aerial Surveys 30 August–4 September 2013

Leg Type	Leg Type Definition
Systematic	Pre-determined line-transect legs
Transiting	Flying between the airport and the survey grid locations
Connector	Short lines connecting systematic transect lines
Circling	Flying clockwise circles around sightings to verify species and group size via photography

Table 2. Flight Effort during Puget Sound Marine Mammal Aerial Surveys 30 August–4 September 2013.

Date	Flight of Day	Time Engines On	Time Engines Off	Total Engine Time (hh:mm) [#]	Time Wheels Up	Time Wheels Down	Total Flight Time (hh:mm)	Total Flight Dist (km) [*]	Total Flight Dist (nm) ^{**}	Start Obs. ¹	End Obs.	Total Obs. Time (hh:mm)	Flight Area	General Weather	Comments
8/30/13	1	8:52	12:42	3:50	8:59	12:41	3:42	626	338	9:12	12:28	3:16	E Whidbey, Admiralty Inlet, N Hood Canal	Partly Cloudy Bf 1-4	
8/30/13	2	14:05	17:20	3:15	14:12	17:18	3:06	546	295	14:20	17:13	2:52	Hood Canal, S Puget Sound, Vashon	Partly Cloudy Bf 0-3	
8/31/13	1	8:14	12:19	4:05	8:33	12:18	3:45	655	354	8:39	12:12	3:33	S Puget Sound, Vashon	Clear Skies Bf 0-4	Risso's dolphin sighting
8/31/13	2	13:48	17:11	3:22	13:51	17:08	3:17	574	310	13:56	17:02	3:05	E Whidbey, S Whidbey, Admiralty Inlet, N Hood Canal, Bainbridge	Clear Skies Bf 0-4	
9/1/13	1	8:11	11:44	3:32	8:18	11:41	3:23	533	288	8:46	11:39	2:53	E Whidbey, S Whidbey, Admiralty Inlet	Clear Skies Bf 0-3	8 fish schools seen
9/1/13	2	13:22	16:55	3:33	13:27	16:54	3:26	580	313	13:36	16:48	3:12	S Puget Sound, Vashon, Bainbridge	Clear Skies Bf 0-3	
9/2/13	1	7:58	11:09	3:11	8:04	11:07	3:02	500	270	8:12	11:00	2:47	S Whidbey, Seattle, Bainbridge, N Hood Canal	Clear Skies Bf 0-2	
9/2/13	2	12:37	17:13	4:36	12:41	17:11	4:30	794	429	12:46	17:05	4:18	E Whidbey, Admiralty Inlet, Hood Canal, Seattle, S Puget Sound	Clear Skies Bf 0-4	138 total sightings (highest sighting total of all flights)
9/3/13	1	14:22	18:44	4:22	14:27	18:42	4:14	732	395	14:35	18:34	3:59	S Puget Sound, Seattle, Bainbridge	Overcast Bf 0-3	Late start due to thunderstorms

Date	Flight of Day	Time Engines On	Time Engines Off	Total Engine Time (hh:mm) [#]	Time Wheels Up	Time Wheels Down	Total Flight Time (hh:mm)	Total Flight Dist (km) [*]	Total Flight Dist (nm) ^{**}	Start Obs. ¹	End Obs.	Total Obs. Time (hh:mm)	Flight Area	General Weather	Comments
9/4/13	1	8:32	10:13	1:41	8:38	10:11	1:32:44	246	133	8:45	10:04	1:19	Seattle, Vashon	Overcast Bf 0-3	Short flight due to hours allotted for survey
	10 Flights		Total Engine Time	35:31		Total Flown:	34:01	5785	3124		Total Obs Time	31:17⁺⁺			

*km = kilometers, **nm = nautical miles, ¹obs = observation, [†]Bf = Beaufort sea state

[#]Time is rounded to hours and minutes (hh:mm).

⁺⁺An additional ~14 hour in-flight time spent ferrying plane to and from Oxnard, California.

Table 3. Number of Sightings by Species Observed during Puget Sound Marine Mammal Aerial Surveys 30 August - 4 September 2013.

Species Common Name*	Species Scientific Name	No. Groups Sighted	Estimated No. Individuals Sighted	Estimated Average Group Size	Minimum Group Size	Maximum Group Size	Standard Deviation
Harbor Seal	<i>Phoca vitulina</i>	675	1,512	2.2	1	150	8.36
Harbor Porpoise	<i>Phocoena phocoena</i>	66	148	2.2	1	10	1.96
California Sea Lion	<i>Zalophus californianus</i>	15	20	1.3	1	5	1.04
Unidentified Small Marine Mammal	Unidentified Small Cetacean	7	8	1.1	1	2	0.38
Unidentified Marine Mammal	Cetacean or Pinniped	4	6	1.5	1	3	1
Unidentified Pinniped	Pinniped	4	9	2.3	1	5	1.89
Risso's Dolphin	<i>Grampus griseus</i>	2	4	2.0	2	2	0
Unidentified Porpoise	Unidentified Porpoise	5	7	1.4	1	2	0.55
Unidentified Medium Marine Mammal	Unidentified Medium Cetacean	1	2	2.0	2	2	0
Total		779	1716	1.8	1.2	20.1	1.68

*Listed in descending order of sighting frequency (by number of groups sighted).

Table 4. Times and Locations of Sightings of Marine Mammals during Puget Sound Marine Mammal Aerial Surveys 30 August –4 September 2013, including by Survey Subregion.

Date & Time *	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-08-30 9:16:32	California Sea Lion	<i>Zalophus californianus</i>	47.7810	-122.4668	Seattle
2013-08-30 9:16:32	California Sea Lion	<i>Zalophus californianus</i>	47.7810	-122.4684	Seattle
2013-08-30 9:16:32	Unidentified Pinniped	Pinniped	47.7808	-122.4742	Seattle
2013-08-30 9:42:16	Harbor Seal	<i>Phoca vitulina</i>	48.3744	-122.5609	East Whidbey
2013-08-30 9:42:25	Harbor Seal	<i>Phoca vitulina</i>	48.3722	-122.5601	East Whidbey
2013-08-30 9:43:53	Harbor Seal	<i>Phoca vitulina</i>	48.3615	-122.4976	East Whidbey
2013-08-30 9:44:10	Harbor Seal	<i>Phoca vitulina</i>	48.3589	-122.4864	East Whidbey
2013-08-30 10:00:18	Harbor Seal	<i>Phoca vitulina</i>	48.2766	-122.6270	East Whidbey
2013-08-30 10:00:26	Harbor Seal	<i>Phoca vitulina</i>	48.2724	-122.6277	East Whidbey
2013-08-30 10:01:34	Harbor Seal	<i>Phoca vitulina</i>	48.2511	-122.6549	East Whidbey
2013-08-30 10:02:47	Harbor Seal	<i>Phoca vitulina</i>	48.2476	-122.6437	East Whidbey
2013-08-30 10:08:51	Harbor Seal	<i>Phoca vitulina</i>	48.2134	-122.4039	East Whidbey
2013-08-30 10:18:13	Harbor Seal	<i>Phoca vitulina</i>	48.1917	-122.7199	Admiralty Inlet
2013-08-30 10:18:26	Harbor Seal	<i>Phoca vitulina</i>	48.1865	-122.7256	Admiralty Inlet
2013-08-30 10:19:21	Harbor Seal	<i>Phoca vitulina</i>	48.1783	-122.7616	Admiralty Inlet
2013-08-30 10:20:32	Harbor Seal	<i>Phoca vitulina</i>	48.1758	-122.7776	Admiralty Inlet
2013-08-30 10:22:26	Harbor Seal	<i>Phoca vitulina</i>	48.1789	-122.7337	Admiralty Inlet
2013-08-30 10:39:25	Unidentified Marine Mammal	Cetacean or Pinniped	48.1422	-122.6258	Admiralty Inlet
2013-08-30 10:40:29	Harbor Seal	<i>Phoca vitulina</i>	48.1437	-122.6721	Admiralty Inlet
2013-08-30 10:41:00	Unidentified Porpoise	<i>Cetacean</i>	48.1446	-122.6932	Admiralty Inlet
2013-08-30 10:41:23	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1496	-122.7031	Admiralty Inlet
2013-08-30 10:46:02	Harbor Seal	<i>Phoca vitulina</i>	48.1469	-122.6906	Admiralty Inlet
2013-08-30 10:50:22	Harbor Seal	<i>Phoca vitulina</i>	48.1110	-122.7199	Admiralty Inlet
2013-08-30 10:50:25	Harbor Seal	<i>Phoca vitulina</i>	48.1116	-122.7179	Admiralty Inlet
2013-08-30 10:50:20	Harbor Seal	<i>Phoca vitulina</i>	48.1141	-122.7212	Admiralty Inlet

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-08-30 10:50:27	Harbor Seal	<i>Phoca vitulina</i>	48.1105	-122.7159	Admiralty Inlet
2013-08-30 10:51:34	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1075	-122.6722	Admiralty Inlet
2013-08-30 10:53:26	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1047	-122.6788	Admiralty Inlet
2013-08-30 10:57:42	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1109	-122.6344	Admiralty Inlet
2013-08-30 10:58:34	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1077	-122.6027	Admiralty Inlet
2013-08-30 11:10:34	Harbor Seal	<i>Phoca vitulina</i>	48.0768	-122.4644	East Whidbey
2013-08-30 11:10:37	Harbor Seal	<i>Phoca vitulina</i>	48.0770	-122.4666	East Whidbey
2013-08-30 11:53:40	Harbor Seal	<i>Phoca vitulina</i>	47.9783	-122.3360	East Whidbey
2013-08-30 12:01:55	Harbor Porpoise	<i>Phocoena phocoena</i>	47.9436	-122.4939	South Whidbey
2013-08-30 12:19:21	Harbor Seal	<i>Phoca vitulina</i>	47.8783	-122.4091	South Whidbey
2013-08-30 12:19:33	Harbor Seal	<i>Phoca vitulina</i>	47.8751	-122.4177	South Whidbey
2013-08-30 12:24:40	Harbor Seal	<i>Phoca vitulina</i>	47.8770	-122.6379	Hood Canal
2013-08-30 12:25:48	Harbor Seal	<i>Phoca vitulina</i>	47.8529	-122.6648	Hood Canal
2013-08-30 12:26:07	Harbor Seal	<i>Phoca vitulina</i>	47.8424	-122.6707	Hood Canal
2013-08-30 12:26:15	Harbor Seal	<i>Phoca vitulina</i>	47.8373	-122.6705	Hood Canal
2013-08-30 12:28:16	Harbor Porpoise	<i>Phocoena phocoena</i>	47.7844	-122.7061	Hood Canal
2013-08-30 14:20:45	Unidentified Porpoise	Cetacean	47.6655	-122.7742	Hood Canal
2013-08-30 14:22:19	Harbor Seal	<i>Phoca vitulina</i>	47.6663	-122.7857	Hood Canal
2013-08-30 14:22:31	Harbor Seal	<i>Phoca vitulina</i>	47.6705	-122.7966	Hood Canal
2013-08-30 14:27:08	Harbor Seal	<i>Phoca vitulina</i>	47.7773	-122.8308	Hood Canal
2013-08-30 14:27:21	Harbor Seal	<i>Phoca vitulina</i>	47.7784	-122.8404	Hood Canal
2013-08-30 14:29:16	Harbor Seal	<i>Phoca vitulina</i>	47.7418	-122.8491	Hood Canal
2013-08-30 14:29:21	Harbor Seal	<i>Phoca vitulina</i>	47.7424	-122.8456	Hood Canal
2013-08-30 14:29:27	Harbor Seal	<i>Phoca vitulina</i>	47.7419	-122.8406	Hood Canal
2013-08-30 14:31:54	Harbor Seal	<i>Phoca vitulina</i>	47.7099	-122.8296	Hood Canal
2013-08-30 14:32:36	Harbor Seal	<i>Phoca vitulina</i>	47.7125	-122.8605	Hood Canal
2013-08-30 14:32:39	Harbor Seal	<i>Phoca vitulina</i>	47.7097	-122.8633	Hood Canal

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-08-30 14:32:46	Harbor Seal	<i>Phoca vitulina</i>	47.7095	-122.8668	Hood Canal
2013-08-30 14:33:16	Harbor Seal	<i>Phoca vitulina</i>	47.7092	-122.8878	Hood Canal
2013-08-30 14:35:08	Harbor Seal	<i>Phoca vitulina</i>	47.6765	-122.8900	Hood Canal
2013-08-30 14:35:14	Harbor Seal	<i>Phoca vitulina</i>	47.6778	-122.8859	Hood Canal
2013-08-30 14:35:16	Harbor Seal	<i>Phoca vitulina</i>	47.6848	-122.8846	Hood Canal
2013-08-30 14:35:37	Harbor Seal	<i>Phoca vitulina</i>	47.6776	-122.8699	Hood Canal
2013-08-30 14:35:39	Harbor Seal	<i>Phoca vitulina</i>	47.6776	-122.8678	Hood Canal
2013-08-30 14:35:42	Harbor Seal	<i>Phoca vitulina</i>	47.6777	-122.8664	Hood Canal
2013-08-30 14:35:42	Harbor Seal	<i>Phoca vitulina</i>	47.6783	-122.8671	Hood Canal
2013-08-30 14:35:44	Harbor Seal	<i>Phoca vitulina</i>	47.6739	-122.8648	Hood Canal
2013-08-30 14:36:00	Harbor Porpoise	<i>Phocoena phocoena</i>	47.6784	-122.8539	Hood Canal
2013-08-30 14:36:19	Harbor Seal	<i>Phoca vitulina</i>	47.6833	-122.8497	Hood Canal
2013-08-30 14:36:44	Harbor Seal	<i>Phoca vitulina</i>	47.6861	-122.8637	Hood Canal
2013-08-30 14:37:01	Harbor Seal	<i>Phoca vitulina</i>	47.6823	-122.8635	Hood Canal
2013-08-30 14:39:01	Harbor Seal	<i>Phoca vitulina</i>	47.6779	-122.8510	Hood Canal
2013-08-30 14:39:08	Harbor Seal	<i>Phoca vitulina</i>	47.6746	-122.8464	Hood Canal
2013-08-30 14:39:13	Harbor Seal	<i>Phoca vitulina</i>	47.6783	-122.8421	Hood Canal
2013-08-30 14:39:33	Harbor Seal	<i>Phoca vitulina</i>	47.6790	-122.8287	Hood Canal
2013-08-30 14:39:42	Harbor Seal	<i>Phoca vitulina</i>	47.6771	-122.8232	Hood Canal
2013-08-30 14:39:59	Harbor Seal	<i>Phoca vitulina</i>	47.6783	-122.8115	Hood Canal
2013-08-30 14:40:06	Harbor Seal	<i>Phoca vitulina</i>	47.6748	-122.8058	Hood Canal
2013-08-30 14:40:39	Harbor Seal	<i>Phoca vitulina</i>	47.6781	-122.7837	Hood Canal
2013-08-30 14:40:49	Harbor Seal	<i>Phoca vitulina</i>	47.6786	-122.7774	Hood Canal
2013-08-30 14:41:01	Harbor Seal	<i>Phoca vitulina</i>	47.6760	-122.7681	Hood Canal
2013-08-30 14:43:49	Harbor Seal	<i>Phoca vitulina</i>	47.6529	-122.8209	Hood Canal
2013-08-30 14:46:45	Harbor Seal	<i>Phoca vitulina</i>	47.6442	-122.9379	Hood Canal
2013-08-30 14:46:45	Harbor Seal	<i>Phoca vitulina</i>	47.6437	-122.9385	Hood Canal

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-08-30 14:49:11	Harbor Seal	<i>Phoca vitulina</i>	47.6076	-122.9606	Hood Canal
2013-08-30 14:49:34	Harbor Porpoise	<i>Phocoena phocoena</i>	47.6125	-122.9443	Hood Canal
2013-08-30 14:53:26	Unidentified Small Marine Mammal	Cetacean or Pinniped	47.5757	-122.9990	Hood Canal
2013-08-30 15:07:22	Harbor Seal	<i>Phoca vitulina</i>	47.4093	-123.1076	Hood Canal
2013-08-30 15:07:23	Harbor Seal	<i>Phoca vitulina</i>	47.4123	-123.1067	Hood Canal
2013-08-30 15:11:14	Harbor Seal	<i>Phoca vitulina</i>	47.4097	-122.9254	Hood Canal
2013-08-30 15:11:20	Harbor Seal	<i>Phoca vitulina</i>	47.4098	-122.9212	Hood Canal
2013-08-30 15:21:22	Harbor Seal	<i>Phoca vitulina</i>	47.3441	-123.1381	Hood Canal
2013-08-30 15:21:33	Harbor Seal	<i>Phoca vitulina</i>	47.3440	-123.1310	Hood Canal
2013-08-30 15:21:39	Harbor Seal	<i>Phoca vitulina</i>	47.3439	-123.1303	Hood Canal
2013-08-30 15:21:55	Harbor Seal	<i>Phoca vitulina</i>	47.3444	-123.1166	Hood Canal
2013-08-30 15:34:42	Harbor Seal	<i>Phoca vitulina</i>	47.1139	-122.6862	Southern Puget Sound
2013-08-30 15:35:07	Harbor Seal	<i>Phoca vitulina</i>	47.1133	-122.7032	Southern Puget Sound
2013-08-30 15:35:19	Harbor Seal	<i>Phoca vitulina</i>	47.1152	-122.7120	Southern Puget Sound
2013-08-30 15:35:22	Harbor Seal	<i>Phoca vitulina</i>	47.1123	-122.7148	Southern Puget Sound
2013-08-30 15:39:48	Harbor Seal	<i>Phoca vitulina</i>	47.1103	-122.8970	Southern Puget Sound
2013-08-30 15:39:54	Harbor Seal	<i>Phoca vitulina</i>	47.1099	-122.9012	Southern Puget Sound
2013-08-30 15:51:05	Harbor Seal	<i>Phoca vitulina</i>	47.1467	-122.7747	Southern Puget Sound
2013-08-30 15:51:07	Harbor Seal	<i>Phoca vitulina</i>	47.1471	-122.7739	Southern Puget Sound
2013-08-30 15:51:45	Harbor Seal	<i>Phoca vitulina</i>	47.1478	-122.7472	Southern Puget Sound
2013-08-30 15:53:56	Harbor Seal	<i>Phoca vitulina</i>	47.1475	-122.6557	Southern Puget Sound
2013-08-30 15:54:12	Harbor Seal	<i>Phoca vitulina</i>	47.1449	-122.6452	Southern Puget Sound
2013-08-30 15:54:14	Harbor Seal	<i>Phoca vitulina</i>	47.1482	-122.6443	Southern Puget Sound
2013-08-30 15:54:36	Harbor Seal	<i>Phoca vitulina</i>	47.1478	-122.6296	Southern Puget Sound
2013-08-30 15:56:58	Harbor Seal	<i>Phoca vitulina</i>	47.1800	-122.6225	Southern Puget Sound
2013-08-30 15:57:00	Harbor Seal	<i>Phoca vitulina</i>	47.1799	-122.6238	Southern Puget Sound
2013-08-30 15:57:05	Harbor Seal	<i>Phoca vitulina</i>	47.1816	-122.6274	Southern Puget Sound

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-08-30 16:00:04	Harbor Seal	<i>Phoca vitulina</i>	47.1775	-122.7519	Southern Puget Sound
2013-08-30 16:02:16	Harbor Seal	<i>Phoca vitulina</i>	47.1773	-122.8376	Southern Puget Sound
2013-08-30 16:02:24	Harbor Seal	<i>Phoca vitulina</i>	47.1773	-122.8435	Southern Puget Sound
2013-08-30 16:05:27	Harbor Seal	<i>Phoca vitulina</i>	47.1912	-122.9192	Southern Puget Sound
2013-08-30 16:08:38	Harbor Seal	<i>Phoca vitulina</i>	47.2071	-122.7962	Southern Puget Sound
2013-08-30 16:11:53	Harbor Seal	<i>Phoca vitulina</i>	47.2136	-122.6594	Southern Puget Sound
2013-08-30 16:12:32	Harbor Seal	<i>Phoca vitulina</i>	47.2135	-122.6337	Southern Puget Sound
2013-08-30 16:12:43	Harbor Seal	<i>Phoca vitulina</i>	47.2134	-122.6254	Southern Puget Sound
2013-08-30 16:13:07	Harbor Porpoise	<i>Phocoena phocoena</i>	47.2134	-122.6099	Southern Puget Sound
2013-08-30 16:13:26	Harbor Seal	<i>Phoca vitulina</i>	47.2151	-122.5976	Southern Puget Sound
2013-08-30 16:15:02	Harbor Seal	<i>Phoca vitulina</i>	47.2399	-122.5622	Southern Puget Sound
2013-08-30 16:15:46	Harbor Seal	<i>Phoca vitulina</i>	47.2433	-122.5820	Southern Puget Sound
2013-08-30 16:16:09	Harbor Porpoise	<i>Phocoena phocoena</i>	47.2433	-122.5942	Southern Puget Sound
2013-08-30 16:18:35	Harbor Seal	<i>Phoca vitulina</i>	47.2421	-122.5860	Southern Puget Sound
2013-08-30 16:24:25	Harbor Porpoise	<i>Phocoena phocoena</i>	47.2433	-122.6530	Southern Puget Sound
2013-08-30 16:24:37	Harbor Seal	<i>Phoca vitulina</i>	47.2425	-122.6605	Southern Puget Sound
2013-08-30 16:24:40	Harbor Seal	<i>Phoca vitulina</i>	47.2447	-122.6633	Southern Puget Sound
2013-08-30 16:24:59	Harbor Seal	<i>Phoca vitulina</i>	47.2442	-122.6757	Southern Puget Sound
2013-08-30 16:25:00	Harbor Seal	<i>Phoca vitulina</i>	47.2435	-122.6764	Southern Puget Sound
2013-08-30 16:25:15	Harbor Seal	<i>Phoca vitulina</i>	47.2436	-122.6871	Southern Puget Sound
2013-08-30 16:25:12	Harbor Seal	<i>Phoca vitulina</i>	47.2461	-122.6850	Southern Puget Sound
2013-08-30 16:25:25	Harbor Seal	<i>Phoca vitulina</i>	47.2447	-122.6943	Southern Puget Sound
2013-08-30 16:25:36	Harbor Seal	<i>Phoca vitulina</i>	47.2440	-122.7029	Southern Puget Sound
2013-08-30 16:28:53	Harbor Seal	<i>Phoca vitulina</i>	47.2459	-122.8491	Southern Puget Sound
2013-08-30 16:34:09	Harbor Seal	<i>Phoca vitulina</i>	47.2790	-122.7284	Southern Puget Sound
2013-08-30 16:34:15	Harbor Seal	<i>Phoca vitulina</i>	47.2768	-122.7241	Southern Puget Sound
2013-08-30 16:34:30	Harbor Seal	<i>Phoca vitulina</i>	47.2779	-122.7131	Southern Puget Sound

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-08-30 16:34:52	Harbor Porpoise	<i>Phocoena phocoena</i>	47.2793	-122.6967	Southern Puget Sound
2013-08-30 16:34:52	Harbor Seal	<i>Phoca vitulina</i>	47.2792	-122.6990	Southern Puget Sound
2013-08-30 16:35:57	Harbor Porpoise	<i>Phocoena phocoena</i>	47.2645	-122.7023	Southern Puget Sound
2013-08-30 16:36:27	Harbor Seal	<i>Phoca vitulina</i>	47.2708	-122.7121	Southern Puget Sound
2013-08-30 16:40:20	Harbor Seal	<i>Phoca vitulina</i>	47.2683	-122.6831	Southern Puget Sound
2013-08-30 16:46:35	Harbor Seal	<i>Phoca vitulina</i>	47.2941	-122.5356	Vashon
2013-08-30 16:46:42	Harbor Seal	<i>Phoca vitulina</i>	47.2972	-122.5300	Vashon
2013-08-30 16:50:05	Harbor Seal	<i>Phoca vitulina</i>	47.2988	-122.4238	Vashon
2013-08-30 16:51:16	Harbor Seal	<i>Phoca vitulina</i>	47.3123	-122.4666	Vashon
2013-08-30 16:51:22	Harbor Seal	<i>Phoca vitulina</i>	47.3085	-122.4702	Vashon
2013-08-30 16:51:39	Harbor Seal	<i>Phoca vitulina</i>	47.3098	-122.4836	Vashon
2013-08-30 16:52:09	Harbor Seal	<i>Phoca vitulina</i>	47.3086	-122.5051	Vashon
2013-08-30 16:53:28	Harbor Seal	<i>Phoca vitulina</i>	47.3077	-122.5613	Southern Puget Sound
2013-08-30 16:53:38	Harbor Seal	<i>Phoca vitulina</i>	47.3102	-122.5682	Southern Puget Sound
2013-08-30 16:56:39	Harbor Seal	<i>Phoca vitulina</i>	47.3103	-122.6974	Southern Puget Sound
2013-08-30 16:57:02	Harbor Seal	<i>Phoca vitulina</i>	47.3085	-122.7128	Southern Puget Sound
2013-08-30 17:05:40	Harbor Seal	<i>Phoca vitulina</i>	47.3433	-122.6864	Southern Puget Sound
2013-08-30 17:10:24	Harbor Seal	<i>Phoca vitulina</i>	47.3436	-122.4799	Vashon
2013-08-30 17:10:26	Harbor Seal	<i>Phoca vitulina</i>	47.3449	-122.4784	Vashon
2013-08-30 17:10:33	Harbor Seal	<i>Phoca vitulina</i>	47.3421	-122.4723	Vashon
2013-08-31 8:43:43	Harbor Seal	<i>Phoca vitulina</i>	47.2476	-122.6846	Southern Puget Sound
2013-08-31 8:43:44	Harbor Seal	<i>Phoca vitulina</i>	47.2498	-122.6861	Southern Puget Sound
2013-08-31 8:43:50	Harbor Seal	<i>Phoca vitulina</i>	47.2443	-122.6903	Southern Puget Sound
2013-08-31 8:43:56	Harbor Seal	<i>Phoca vitulina</i>	47.2444	-122.6959	Southern Puget Sound
2013-08-31 8:45:42	Harbor Seal	<i>Phoca vitulina</i>	47.2088	-122.7465	Southern Puget Sound
2013-08-31 8:48:10	California Sea Lion	<i>Zalophus californianus</i>	47.1386	-122.6926	Southern Puget Sound
2013-08-31 8:50:12	Harbor Seal	<i>Phoca vitulina</i>	47.1148	-122.7036	Southern Puget Sound

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-08-31 8:50:16	Harbor Seal	<i>Phoca vitulina</i>	47.1109	-122.7068	Southern Puget Sound
2013-08-31 8:50:25	Harbor Seal	<i>Phoca vitulina</i>	47.1169	-122.7132	Southern Puget Sound
2013-08-31 8:50:27	Harbor Seal	<i>Phoca vitulina</i>	47.1108	-122.7135	Southern Puget Sound
2013-08-31 8:50:36	Harbor Seal	<i>Phoca vitulina</i>	47.1118	-122.7170	Southern Puget Sound
2013-08-31 8:58:04	Harbor Seal	<i>Phoca vitulina</i>	47.1095	-123.0322	Southern Puget Sound
2013-08-31 9:01:33	Harbor Seal	<i>Phoca vitulina</i>	47.1301	-123.0108	Southern Puget Sound
2013-08-31 9:01:40	Harbor Seal	<i>Phoca vitulina</i>	47.1276	-123.0040	Southern Puget Sound
2013-08-31 9:04:02	Harbor Seal	<i>Phoca vitulina</i>	47.1456	-122.9155	Southern Puget Sound
2013-08-31 9:04:13	Harbor Seal	<i>Phoca vitulina</i>	47.1456	-122.9076	Southern Puget Sound
2013-08-31 9:06:04	Harbor Seal	<i>Phoca vitulina</i>	47.1435	-122.8359	Southern Puget Sound
2013-08-31 9:06:08	Harbor Seal	<i>Phoca vitulina</i>	47.1468	-122.8340	Southern Puget Sound
2013-08-31 9:06:10	Harbor Seal	<i>Phoca vitulina</i>	47.1461	-122.8336	Southern Puget Sound
2013-08-31 9:06:20	Harbor Seal	<i>Phoca vitulina</i>	47.1445	-122.6941	Southern Puget Sound
2013-08-31 9:08:08	Harbor Seal	<i>Phoca vitulina</i>	47.1435	-122.7530	Southern Puget Sound
2013-08-31 9:08:14	Harbor Seal	<i>Phoca vitulina</i>	47.1471	-122.7521	Southern Puget Sound
2013-08-31 9:09:19	Harbor Seal	<i>Phoca vitulina</i>	47.1440	-122.7115	Southern Puget Sound
2013-08-31 9:09:47	Harbor Seal	<i>Phoca vitulina</i>	47.1440	-122.6867	Southern Puget Sound
2013-08-31 9:11:13	California Sea Lion	<i>Zalophus californianus</i>	47.1463	-122.6285	Southern Puget Sound
2013-08-31 9:13:45	Harbor Seal	<i>Phoca vitulina</i>	47.1794	-122.6207	Southern Puget Sound
2013-08-31 9:13:44	Harbor Seal	<i>Phoca vitulina</i>	47.1793	-122.6200	Southern Puget Sound
2013-08-31 9:14:02	Harbor Seal	<i>Phoca vitulina</i>	47.1793	-122.6320	Southern Puget Sound
2013-08-31 9:17:57	Harbor Seal	<i>Phoca vitulina</i>	47.1784	-122.7974	Southern Puget Sound
2013-08-31 9:18:05	Harbor Seal	<i>Phoca vitulina</i>	47.1754	-122.8028	Southern Puget Sound
2013-08-31 9:18:49	Harbor Seal	<i>Phoca vitulina</i>	47.1742	-122.8281	Southern Puget Sound
2013-08-31 9:22:38	Harbor Seal	<i>Phoca vitulina</i>	47.1845	-122.9048	Southern Puget Sound
2013-08-31 9:24:41	Harbor Seal	<i>Phoca vitulina</i>	47.2102	-122.8268	Southern Puget Sound
2013-08-31 9:28:55	Harbor Seal	<i>Phoca vitulina</i>	47.2164	-122.6605	Southern Puget Sound

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-08-31 9:29:35	Harbor Seal	<i>Phoca vitulina</i>	47.2116	-122.6352	Southern Puget Sound
2013-08-31 9:29:39	Harbor Seal	<i>Phoca vitulina</i>	47.2117	-122.6333	Southern Puget Sound
2013-08-31 9:30:01	Harbor Seal	<i>Phoca vitulina</i>	47.2109	-122.6188	Southern Puget Sound
2013-08-31 9:30:03	Harbor Seal	<i>Phoca vitulina</i>	47.2089	-122.6175	Southern Puget Sound
2013-08-31 9:30:11	Harbor Seal	<i>Phoca vitulina</i>	47.2115	-122.6132	Southern Puget Sound
2013-08-31 9:30:14	Harbor Seal	<i>Phoca vitulina</i>	47.2130	-122.6106	Southern Puget Sound
2013-08-31 9:30:18	Harbor Seal	<i>Phoca vitulina</i>	47.2103	-122.6083	Southern Puget Sound
2013-08-31 9:30:24	Harbor Seal	<i>Phoca vitulina</i>	47.2118	-122.6051	Southern Puget Sound
2013-08-31 9:30:33	Harbor Seal	<i>Phoca vitulina</i>	47.2098	-122.5997	Southern Puget Sound
2013-08-31 9:30:37	Harbor Seal	<i>Phoca vitulina</i>	47.2093	-122.5972	Southern Puget Sound
2013-08-31 9:32:47	Harbor Seal	<i>Phoca vitulina</i>	47.2441	-122.5663	Southern Puget Sound
2013-08-31 9:32:15	Harbor Seal	<i>Phoca vitulina</i>	47.2343	-122.5624	Southern Puget Sound
2013-08-31 9:33:15	Harbor Seal	<i>Phoca vitulina</i>	47.2427	-122.5846	Southern Puget Sound
2013-08-31 9:33:24	Harbor Seal	<i>Phoca vitulina</i>	47.2426	-122.5903	Southern Puget Sound
2013-08-31 9:34:54	Harbor Seal	<i>Phoca vitulina</i>	47.2426	-122.6543	Southern Puget Sound
2013-08-31 9:35:04	Harbor Seal	<i>Phoca vitulina</i>	47.2443	-122.6618	Southern Puget Sound
2013-08-31 9:35:12	Harbor Porpoise	<i>Phocoena phocoena</i>	47.2407	-122.6654	Southern Puget Sound
2013-08-31 9:55:33	Harbor Seal	<i>Phoca vitulina</i>	47.2408	-122.6974	Southern Puget Sound
2013-08-31 9:56:05	Harbor Seal	<i>Phoca vitulina</i>	47.2413	-122.7191	Southern Puget Sound
2013-08-31 10:01:25	Harbor Seal	<i>Phoca vitulina</i>	47.2763	-122.8662	Southern Puget Sound
2013-08-31 10:01:37	Harbor Seal	<i>Phoca vitulina</i>	47.2766	-122.8585	Southern Puget Sound
2013-08-31 10:01:56	Harbor Seal	<i>Phoca vitulina</i>	47.2751	-122.8468	Southern Puget Sound
2013-08-31 10:02:45	Harbor Seal	<i>Phoca vitulina</i>	47.2800	-122.8144	Southern Puget Sound
2013-08-31 10:05:06	Harbor Seal	<i>Phoca vitulina</i>	47.2753	-122.7192	Southern Puget Sound
2013-08-31 10:05:26	Harbor Seal	<i>Phoca vitulina</i>	47.2806	-122.7034	Southern Puget Sound
2013-08-31 10:05:44	Harbor Seal	<i>Phoca vitulina</i>	47.2766	-122.6917	Southern Puget Sound
2013-08-31 10:05:56	Harbor Seal	<i>Phoca vitulina</i>	47.2765	-122.6850	Southern Puget Sound

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-08-31 10:06:25	Harbor Seal	<i>Phoca vitulina</i>	47.2800	-122.6627	Southern Puget Sound
2013-08-31 10:07:11	Harbor Seal	<i>Phoca vitulina</i>	47.2765	-122.6325	Southern Puget Sound
2013-08-31 10:08:15	Unidentified Marine Mammal	Cetacean or Pinniped	47.2751	-122.5880	Southern Puget Sound
2013-08-31 10:09:36	Harbor Seal	<i>Phoca vitulina</i>	47.2743	-122.5350	Southern Puget Sound
2013-08-31 10:09:43	Harbor Seal	<i>Phoca vitulina</i>	47.2796	-122.5277	Southern Puget Sound
2013-08-31 10:11:15	Harbor Seal	<i>Phoca vitulina</i>	47.2793	-122.4666	Vashon
2013-08-31 10:14:12	Harbor Seal	<i>Phoca vitulina</i>	47.3122	-122.4426	Vashon
2013-08-31 10:15:17	Harbor Seal	<i>Phoca vitulina</i>	47.3098	-122.4900	Vashon
2013-08-31 10:15:21	Harbor Seal	<i>Phoca vitulina</i>	47.3162	-122.4927	Vashon
2013-08-31 10:15:32	Harbor Seal	<i>Phoca vitulina</i>	47.3142	-122.5013	Vashon
2013-08-31 10:16:37	Harbor Seal	<i>Phoca vitulina</i>	47.3094	-122.5498	Southern Puget Sound
2013-08-31 10:22:31	Harbor Seal	<i>Phoca vitulina</i>	47.3091	-122.7970	Southern Puget Sound
2013-08-31 10:22:35	Harbor Seal	<i>Phoca vitulina</i>	47.3119	-122.8003	Southern Puget Sound
2013-08-31 10:22:56	Harbor Seal	<i>Phoca vitulina</i>	47.3117	-122.8161	Southern Puget Sound
2013-08-31 10:23:03	Harbor Seal	<i>Phoca vitulina</i>	47.3071	-122.8198	Southern Puget Sound
2013-08-31 10:25:11	Unidentified Marine Mammal	Cetacean or Pinniped	47.3036	-122.8105	Southern Puget Sound
2013-08-31 10:26:11	Harbor Seal	<i>Phoca vitulina</i>	47.3139	-122.8309	Southern Puget Sound
2013-08-31 10:58:42	Harbor Seal	<i>Phoca vitulina</i>	47.4399	-122.4392	Vashon
2013-08-31 11:13:19	Harbor Seal	<i>Phoca vitulina</i>	47.5419	-122.6535	Bainbridge
2013-08-31 11:13:45	Harbor Seal	<i>Phoca vitulina</i>	47.5418	-122.6717	Bainbridge
2013-08-31 11:19:34	Risso's Dolphin	<i>Grampus griseus</i>	47.5449	-122.4449	Vashon
2013-08-31 11:34:11	Harbor Seal	<i>Phoca vitulina</i>	47.5746	-122.4273	Vashon
2013-08-31 11:34:10	Harbor Seal	<i>Phoca vitulina</i>	47.5748	-122.4266	Vashon
2013-08-31 11:36:52	California Sea Lion	<i>Zalophus californianus</i>	47.5755	-122.5351	Vashon
2013-08-31 11:49:43	Harbor Seal	<i>Phoca vitulina</i>	47.6178	-122.3739	Seattle
2013-08-31 11:50:03	Harbor Seal	<i>Phoca vitulina</i>	47.6240	-122.3848	Seattle
2013-08-31 14:42:56	California Sea Lion	<i>Zalophus californianus</i>	47.8451	-122.5778	Hood Canal

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-08-31 14:43:08	Harbor Seal	<i>Phoca vitulina</i>	47.8414	-122.5861	Hood Canal
2013-08-31 14:43:14	Harbor Seal	<i>Phoca vitulina</i>	47.8462	-122.5903	Hood Canal
2013-08-31 14:51:42	Harbor Seal	<i>Phoca vitulina</i>	47.8774	-122.5107	South Whidbey
2013-08-31 14:53:44	Harbor Seal	<i>Phoca vitulina</i>	47.8770	-122.4240	South Whidbey
2013-08-31 14:54:19	Harbor Seal	<i>Phoca vitulina</i>	47.8774	-122.3972	South Whidbey
2013-08-31 14:55:47	Harbor Seal	<i>Phoca vitulina</i>	47.8805	-122.3358	South Whidbey
2013-08-31 14:57:39	Harbor Seal	<i>Phoca vitulina</i>	47.9113	-122.3446	South Whidbey
2013-08-31 15:08:06	Harbor Seal	<i>Phoca vitulina</i>	47.9480	-122.6692	Hood Canal
2013-08-31 15:09:51	Harbor Seal	<i>Phoca vitulina</i>	47.9500	-122.6589	South Whidbey
2013-08-31 15:14:52	Harbor Seal	<i>Phoca vitulina</i>	47.9432	-122.4382	South Whidbey
2013-08-31 15:33:06	Harbor Seal	<i>Phoca vitulina</i>	48.0101	-122.6760	Admiralty Inlet
2013-08-31 15:54:09	Harbor Seal	<i>Phoca vitulina</i>	48.0453	-122.6036	Admiralty Inlet
2013-08-31 15:56:16	Harbor Seal	<i>Phoca vitulina</i>	48.0498	-122.6811	Admiralty Inlet
2013-08-31 15:58:53	Harbor Seal	<i>Phoca vitulina</i>	48.0748	-122.6238	Admiralty Inlet
2013-08-31 15:59:10	Harbor Seal	<i>Phoca vitulina</i>	48.0762	-122.6130	Admiralty Inlet
2013-08-31 16:00:48	Harbor Seal	<i>Phoca vitulina</i>	48.0798	-122.5453	East Whidbey
2013-08-31 16:05:04	Harbor Seal	<i>Phoca vitulina</i>	48.0779	-122.3659	East Whidbey
2013-08-31 16:16:32	Harbor Seal	<i>Phoca vitulina</i>	48.1115	-122.6715	Admiralty Inlet
2013-08-31 16:17:50	Harbor Seal	<i>Phoca vitulina</i>	48.1116	-122.7264	Admiralty Inlet
2013-08-31 16:18:53	California Sea Lion	<i>Zalophus californianus</i>	48.1104	-122.7684	Admiralty Inlet
2013-08-31 16:20:51	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1467	-122.7366	Admiralty Inlet
2013-08-31 16:21:02	Harbor Seal	<i>Phoca vitulina</i>	48.1449	-122.7286	Admiralty Inlet
2013-08-31 16:21:09	Harbor Porpoise	<i>Phocoena phocoena</i>	47.3267	-122.2259	Admiralty Inlet
2013-08-31 16:32:02	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1447	-122.6608	Admiralty Inlet
2013-08-31 16:32:10	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1438	-122.6556	Admiralty Inlet
2013-08-31 16:34:22	Harbor Seal	<i>Phoca vitulina</i>	48.1452	-122.5570	East Whidbey
2013-08-31 16:37:44	Harbor Seal	<i>Phoca vitulina</i>	48.1445	-122.4067	East Whidbey

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-08-31 16:38:11	Harbor Seal	<i>Phoca vitulina</i>	48.1443	-122.3887	East Whidbey
2013-08-31 16:38:49	Harbor Seal	<i>Phoca vitulina</i>	48.1462	-122.3650	East Whidbey
2013-08-31 16:40:26	Harbor Seal	<i>Phoca vitulina</i>	48.1029	-122.3548	East Whidbey
2013-08-31 17:00:01	Harbor Porpoise	<i>Phocoena phocoena</i>	47.4953	-122.4264	Vashon
2013-09-01 8:51:25	Harbor Seal	<i>Phoca vitulina</i>	48.1756	-122.5721	East Whidbey
2013-09-01 8:55:29	Harbor Seal	<i>Phoca vitulina</i>	48.1639	-122.7116	Admiralty Inlet
2013-09-01 8:57:03	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1750	-122.7210	Admiralty Inlet
2013-09-01 9:07:18	Harbor Seal	<i>Phoca vitulina</i>	48.1735	-122.7603	Admiralty Inlet
2013-09-01 9:07:28	Harbor Seal	<i>Phoca vitulina</i>	48.1781	-122.7657	Admiralty Inlet
2013-09-01 9:07:57	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1869	-122.7550	Admiralty Inlet
2013-09-01 9:08:10	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1899	-122.7470	Admiralty Inlet
2013-09-01 9:08:44	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1931	-122.7215	Admiralty Inlet
2013-09-01 9:08:59	Harbor Seal	<i>Phoca vitulina</i>	48.1906	-122.7095	Admiralty Inlet
2013-09-01 9:09:22	Harbor Seal	<i>Phoca vitulina</i>	48.1911	-122.7111	Admiralty Inlet
2013-09-01 9:13:11	Harbor Seal	<i>Phoca vitulina</i>	48.2104	-122.5405	East Whidbey
2013-09-01 9:16:37	Harbor Seal	<i>Phoca vitulina</i>	48.2118	-122.4027	East Whidbey
2013-09-01 9:22:02	Harbor Seal	<i>Phoca vitulina</i>	48.2409	-122.5441	East Whidbey
2013-09-01 9:23:33	Harbor Porpoise	<i>Phocoena phocoena</i>	48.2385	-122.6052	East Whidbey
2013-09-01 9:25:59	Harbor Seal	<i>Phoca vitulina</i>	48.2413	-122.6063	East Whidbey
2013-09-01 9:28:25	Harbor Seal	<i>Phoca vitulina</i>	48.2418	-122.6325	East Whidbey
2013-09-01 9:31:33	Harbor Seal	<i>Phoca vitulina</i>	48.2840	-122.6053	East Whidbey
2013-09-01 9:31:35	Harbor Seal	<i>Phoca vitulina</i>	48.2844	-122.6036	East Whidbey
2013-09-01 9:32:32	Harbor Seal	<i>Phoca vitulina</i>	48.2823	-122.5639	East Whidbey
2013-09-01 9:32:36	Harbor Seal	<i>Phoca vitulina</i>	48.2786	-122.5614	East Whidbey
2013-09-01 9:35:36	Harbor Seal	<i>Phoca vitulina</i>	48.2772	-122.4331	East Whidbey
2013-09-01 9:36:25	Harbor Seal	<i>Phoca vitulina</i>	48.2719	-122.4016	East Whidbey
2013-09-01 9:40:46	Harbor Seal	<i>Phoca vitulina</i>	48.3104	-122.4406	East Whidbey

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-01 9:45:16	Harbor Seal	<i>Phoca vitulina</i>	48.3447	-122.5192	East Whidbey
2013-09-01 9:50:34	Harbor Seal	<i>Phoca vitulina</i>	48.3744	-122.5622	East Whidbey
2013-09-01 9:50:59	Harbor Seal	<i>Phoca vitulina</i>	48.3734	-122.5784	East Whidbey
2013-09-01 9:57:43	Harbor Seal	<i>Phoca vitulina</i>	48.3985	-122.5809	East Whidbey
2013-09-01 9:59:15	Harbor Seal	<i>Phoca vitulina</i>	48.3560	-122.5553	East Whidbey
2013-09-01 9:59:36	Harbor Seal	<i>Phoca vitulina</i>	48.3471	-122.5463	East Whidbey
2013-09-01 10:02:17	Harbor Seal	<i>Phoca vitulina</i>	48.2763	-122.5257	East Whidbey
2013-09-01 10:03:02	Harbor Porpoise	<i>Phocoena phocoena</i>	48.2557	-122.5423	East Whidbey
2013-09-01 10:03:05	Harbor Seal	<i>Phoca vitulina</i>	48.2551	-122.5439	East Whidbey
2013-09-01 10:04:37	Harbor Seal	<i>Phoca vitulina</i>	48.2154	-122.5763	East Whidbey
2013-09-01 10:04:50	Harbor Seal	<i>Phoca vitulina</i>	48.2096	-122.5796	East Whidbey
2013-09-01 10:05:27	Harbor Seal	<i>Phoca vitulina</i>	48.1934	-122.5893	East Whidbey
2013-09-01 10:07:19	Harbor Seal	<i>Phoca vitulina</i>	48.1485	-122.6331	Admiralty Inlet
2013-09-01 10:07:34	Harbor Seal	<i>Phoca vitulina</i>	48.1422	-122.6405	Admiralty Inlet
2013-09-01 10:08:26	Harbor Seal	<i>Phoca vitulina</i>	48.1214	-122.6627	Admiralty Inlet
2013-09-01 10:09:10	Harbor Porpoise	<i>Phocoena phocoena</i>	48.0995	-122.6698	Admiralty Inlet
2013-09-01 10:09:15	Harbor Porpoise	<i>Phocoena phocoena</i>	48.0965	-122.6704	Admiralty Inlet
2013-09-01 10:13:05	Harbor Seal	<i>Phoca vitulina</i>	48.0907	-122.6710	Admiralty Inlet
2013-09-01 10:18:32	Harbor Porpoise	<i>Phocoena phocoena</i>	48.0539	-122.6667	Admiralty Inlet
2013-09-01 10:20:19	Harbor Seal	<i>Phoca vitulina</i>	48.0070	-122.6786	Admiralty Inlet
2013-09-01 10:29:56	Harbor Seal	<i>Phoca vitulina</i>	47.7757	-122.8407	Hood Canal
2013-09-01 10:30:17	Harbor Seal	<i>Phoca vitulina</i>	47.7763	-122.8552	Hood Canal
2013-09-01 10:32:13	Harbor Seal	<i>Phoca vitulina</i>	47.7433	-122.8353	Hood Canal
2013-09-01 10:32:43	Harbor Seal	<i>Phoca vitulina</i>	47.7446	-122.8157	Hood Canal
2013-09-01 10:32:56	Harbor Seal	<i>Phoca vitulina</i>	47.7452	-122.8075	Hood Canal
2013-09-01 10:34:41	Harbor Seal	<i>Phoca vitulina</i>	47.7102	-122.8322	Hood Canal
2013-09-01 10:35:13	Harbor Seal	<i>Phoca vitulina</i>	47.7111	-122.8539	Hood Canal

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-01 10:36:01	Harbor Porpoise	<i>Phocoena phocoena</i>	47.7072	-122.8865	Hood Canal
2013-09-01 10:36:57	Harbor Seal	<i>Phoca vitulina</i>	47.7044	-122.8806	Hood Canal
2013-09-01 10:44:31	Harbor Seal	<i>Phoca vitulina</i>	47.6789	-122.8928	Hood Canal
2013-09-01 10:44:47	Harbor Seal	<i>Phoca vitulina</i>	47.6759	-122.8821	Hood Canal
2013-09-01 10:45:08	Harbor Seal	<i>Phoca vitulina</i>	47.6775	-122.8684	Hood Canal
2013-09-01 10:46:19	Harbor Seal	<i>Phoca vitulina</i>	47.6773	-122.8225	Hood Canal
2013-09-01 10:46:38	Harbor Seal	<i>Phoca vitulina</i>	47.6787	-122.8101	Hood Canal
2013-09-01 10:47:53	Harbor Seal	<i>Phoca vitulina</i>	47.6777	-122.7613	Hood Canal
2013-09-01 10:48:05	Harbor Seal	<i>Phoca vitulina</i>	47.6736	-122.7538	Hood Canal
2013-09-01 10:53:13	Harbor Seal	<i>Phoca vitulina</i>	47.6435	-122.9279	Hood Canal
2013-09-01 11:00:24	Harbor Seal	<i>Phoca vitulina</i>	47.5758	-123.0122	Hood Canal
2013-09-01 11:02:20	Harbor Seal	<i>Phoca vitulina</i>	47.5435	-123.0273	Hood Canal
2013-09-01 11:02:47	Harbor Seal	<i>Phoca vitulina</i>	47.5449	-123.0080	Hood Canal
2013-09-01 11:03:02	Harbor Seal	<i>Phoca vitulina</i>	47.5366	-122.9973	Hood Canal
2013-09-01 11:06:25	Harbor Seal	<i>Phoca vitulina</i>	47.4923	-123.0687	Hood Canal
2013-09-01 11:07:44	Harbor Seal	<i>Phoca vitulina</i>	47.4790	-123.0795	Hood Canal
2013-09-01 11:07:49	Harbor Seal	<i>Phoca vitulina</i>	47.4760	-123.0751	Hood Canal
2013-09-01 11:10:48	Harbor Seal	<i>Phoca vitulina</i>	47.4437	-123.1039	Hood Canal
2013-09-01 11:12:44	Harbor Seal	<i>Phoca vitulina</i>	47.4079	-123.1334	Hood Canal
2013-09-01 11:12:51	Harbor Seal	<i>Phoca vitulina</i>	47.4094	-123.1288	Hood Canal
2013-09-01 11:13:15	Harbor Seal	<i>Phoca vitulina</i>	47.4133	-123.1125	Hood Canal
2013-09-01 11:13:18	Harbor Seal	<i>Phoca vitulina</i>	47.4106	-123.1092	Hood Canal
2013-09-01 11:13:21	Harbor Seal	<i>Phoca vitulina</i>	47.4134	-123.1079	Hood Canal
2013-09-01 11:18:12	Harbor Seal	<i>Phoca vitulina</i>	47.4127	-122.8921	Hood Canal
2013-09-01 11:18:23	Harbor Seal	<i>Phoca vitulina</i>	47.4098	-122.8843	Hood Canal
2013-09-01 11:20:07	Harbor Seal	<i>Phoca vitulina</i>	47.3941	-122.9177	Hood Canal
2013-09-01 11:25:40	Harbor Seal	<i>Phoca vitulina</i>	47.3745	-123.1418	Hood Canal

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-01 11:26:27	Harbor Seal	<i>Phoca vitulina</i>	47.3735	-123.1483	Hood Canal
2013-09-01 11:27:08	Harbor Seal	<i>Phoca vitulina</i>	47.3471	-123.1478	Hood Canal
2013-09-01 11:27:11	Harbor Seal	<i>Phoca vitulina</i>	47.3473	-123.1448	Hood Canal
2013-09-01 11:27:19	Harbor Seal	<i>Phoca vitulina</i>	47.3475	-123.1387	Hood Canal
2013-09-01 11:37:01	Harbor Seal	<i>Phoca vitulina</i>	47.0924	-122.9661	Southern Puget Sound
2013-09-01 11:37:01	Harbor Seal	<i>Phoca vitulina</i>	47.0919	-122.9676	Southern Puget Sound
2013-09-01 13:36:31	Harbor Seal	<i>Phoca vitulina</i>	47.1048	-122.6803	Southern Puget Sound
2013-09-01 13:37:59	Harbor Seal	<i>Phoca vitulina</i>	47.1105	-122.7068	Southern Puget Sound
2013-09-01 13:38:39	Harbor Seal	<i>Phoca vitulina</i>	47.1107	-122.7346	Southern Puget Sound
2013-09-01 13:38:56	Harbor Seal	<i>Phoca vitulina</i>	47.1139	-122.7458	Southern Puget Sound
2013-09-01 13:39:00	Harbor Seal	<i>Phoca vitulina</i>	47.1109	-122.7458	Southern Puget Sound
2013-09-01 13:46:31	Harbor Seal	<i>Phoca vitulina</i>	47.1155	-122.9169	Southern Puget Sound
2013-09-01 13:49:02	Harbor Seal	<i>Phoca vitulina</i>	47.1097	-123.0281	Southern Puget Sound
2013-09-01 13:53:59	Harbor Seal	<i>Phoca vitulina</i>	47.1397	-122.9396	Southern Puget Sound
2013-09-01 13:56:29	Harbor Seal	<i>Phoca vitulina</i>	47.1456	-122.8334	Southern Puget Sound
2013-09-01 13:58:48	Harbor Seal	<i>Phoca vitulina</i>	47.1445	-122.7347	Southern Puget Sound
2013-09-01 13:59:20	Harbor Seal	<i>Phoca vitulina</i>	47.1450	-122.7083	Southern Puget Sound
2013-09-01 13:59:37	Harbor Seal	<i>Phoca vitulina</i>	47.1420	-122.7086	Southern Puget Sound
2013-09-01 14:00:39	Harbor Seal	<i>Phoca vitulina</i>	47.1448	-122.6607	Southern Puget Sound
2013-09-01 14:00:42	Harbor Porpoise	<i>Phocoena phocoena</i>	47.1423	-122.6586	Southern Puget Sound
2013-09-01 14:10:51	Harbor Seal	<i>Phoca vitulina</i>	47.1780	-122.6694	Southern Puget Sound
2013-09-01 14:12:17	Harbor Seal	<i>Phoca vitulina</i>	47.1782	-122.7275	Southern Puget Sound
2013-09-01 14:18:16	Harbor Seal	<i>Phoca vitulina</i>	47.1875	-122.9346	Southern Puget Sound
2013-09-01 14:25:31	Harbor Seal	<i>Phoca vitulina</i>	47.2107	-122.6315	Southern Puget Sound
2013-09-01 14:26:04	Harbor Seal	<i>Phoca vitulina</i>	47.2077	-122.6064	Southern Puget Sound
2013-09-01 14:26:09	Harbor Seal	<i>Phoca vitulina</i>	47.2111	-122.6020	Southern Puget Sound
2013-09-01 14:26:20	Harbor Seal	<i>Phoca vitulina</i>	47.2130	-122.5947	Southern Puget Sound

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-01 14:26:43	Harbor Seal	<i>Phoca vitulina</i>	47.2128	-122.5789	Southern Puget Sound
2013-09-01 14:28:26	Harbor Seal	<i>Phoca vitulina</i>	47.2455	-122.5685	Southern Puget Sound
2013-09-01 14:28:47	Harbor Seal	<i>Phoca vitulina</i>	47.2461	-122.5862	Southern Puget Sound
2013-09-01 14:29:11	Unidentified Porpoise	Cetacean	47.2410	-122.6020	Southern Puget Sound
2013-09-01 14:33:27	Harbor Seal	<i>Phoca vitulina</i>	47.2472	-122.6604	Southern Puget Sound
2013-09-01 14:33:31	Harbor Seal	<i>Phoca vitulina</i>	47.2477	-122.6630	Southern Puget Sound
2013-09-01 14:34:07	Harbor Seal	<i>Phoca vitulina</i>	47.2469	-122.6871	Southern Puget Sound
2013-09-01 14:34:21	Harbor Seal	<i>Phoca vitulina</i>	47.2468	-122.6958	Southern Puget Sound
2013-09-01 14:38:19	Harbor Seal	<i>Phoca vitulina</i>	47.2454	-122.8507	Southern Puget Sound
2013-09-01 14:40:30	Harbor Seal	<i>Phoca vitulina</i>	47.2781	-122.8582	Southern Puget Sound
2013-09-01 14:41:31	Harbor Seal	<i>Phoca vitulina</i>	47.2811	-122.8185	Southern Puget Sound
2013-09-01 14:45:39	Harbor Seal	<i>Phoca vitulina</i>	47.2812	-122.7114	Southern Puget Sound
2013-09-01 14:45:46	Harbor Seal	<i>Phoca vitulina</i>	47.2837	-122.7096	Southern Puget Sound
2013-09-01 14:45:50	Harbor Seal	<i>Phoca vitulina</i>	47.2802	-122.7039	Southern Puget Sound
2013-09-01 14:46:00	Harbor Seal	<i>Phoca vitulina</i>	47.2784	-122.6972	Southern Puget Sound
2013-09-01 14:46:07	Harbor Seal	<i>Phoca vitulina</i>	47.2811	-122.6930	Southern Puget Sound
2013-09-01 14:46:27	Harbor Seal	<i>Phoca vitulina</i>	47.2793	-122.6785	Southern Puget Sound
2013-09-01 14:46:41	Harbor Seal	<i>Phoca vitulina</i>	47.2803	-122.6689	Southern Puget Sound
2013-09-01 14:48:41	Harbor Seal	<i>Phoca vitulina</i>	47.2785	-122.5959	Southern Puget Sound
2013-09-01 14:52:04	Harbor Seal	<i>Phoca vitulina</i>	47.2727	-122.4290	Vashon
2013-09-01 14:54:39	Harbor Seal	<i>Phoca vitulina</i>	47.2874	-122.4256	Vashon
2013-09-01 14:54:56	Harbor Seal	<i>Phoca vitulina</i>	47.2958	-122.4244	Vashon
2013-09-01 14:57:36	Harbor Seal	<i>Phoca vitulina</i>	47.3120	-122.5151	Vashon
2013-09-01 14:58:10	Harbor Seal	<i>Phoca vitulina</i>	47.3097	-122.5424	Southern Puget Sound
2013-09-01 14:58:46	Harbor Seal	<i>Phoca vitulina</i>	47.3097	-122.5563	Southern Puget Sound
2013-09-01 15:02:52	Harbor Seal	<i>Phoca vitulina</i>	47.3097	-122.7248	Southern Puget Sound
2013-09-01 15:02:56	Harbor Seal	<i>Phoca vitulina</i>	47.3129	-122.7291	Southern Puget Sound

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-01 15:03:00	Harbor Porpoise	<i>Phocoena phocoena</i>	47.3077	-122.7321	Southern Puget Sound
2013-09-01 15:06:01	Harbor Seal	<i>Phoca vitulina</i>	47.3035	-122.7297	Southern Puget Sound
2013-09-01 15:16:37	Harbor Seal	<i>Phoca vitulina</i>	47.3426	-122.8033	Southern Puget Sound
2013-09-01 15:16:48	Harbor Seal	<i>Phoca vitulina</i>	47.3437	-122.7958	Southern Puget Sound
2013-09-01 15:19:06	Harbor Seal	<i>Phoca vitulina</i>	47.3430	-122.6984	Southern Puget Sound
2013-09-01 15:19:33	Harbor Seal	<i>Phoca vitulina</i>	47.3464	-122.6794	Southern Puget Sound
2013-09-01 15:19:39	Harbor Seal	<i>Phoca vitulina</i>	47.3431	-122.6826	Southern Puget Sound
2013-09-01 15:19:49	Harbor Seal	<i>Phoca vitulina</i>	47.3449	-122.6687	Southern Puget Sound
2013-09-01 15:19:55	Harbor Seal	<i>Phoca vitulina</i>	47.3453	-122.6680	Southern Puget Sound
2013-09-01 15:29:52	Unidentified Medium Marine Mammal	Cetacean or Pinniped	47.3774	-122.3626	Vashon
2013-09-01 15:46:05	Harbor Seal	<i>Phoca vitulina</i>	47.3771	-122.4038	Vashon
2013-09-01 15:51:23	Harbor Seal	<i>Phoca vitulina</i>	47.4134	-122.5196	Vashon
2013-09-01 16:08:00	Harbor Seal	<i>Phoca vitulina</i>	47.5112	-122.4104	Vashon
2013-09-01 16:08:44	Harbor Seal	<i>Phoca vitulina</i>	47.5076	-122.4373	Vashon
2013-09-01 16:20:29	Harbor Seal	<i>Phoca vitulina</i>	47.5438	-122.4316	Vashon
2013-09-01 16:26:58	Harbor Seal	<i>Phoca vitulina</i>	47.5782	-122.5971	Bainbridge
2013-09-01 16:36:15	Harbor Seal	<i>Phoca vitulina</i>	47.6117	-122.4691	Seattle
2013-09-01 16:36:17	Unidentified Marine Mammal	Cetacean or Pinniped	47.6083	-122.4679	Seattle
2013-09-01 16:37:10	Harbor Porpoise	<i>Phocoena phocoena</i>	47.6119	-122.4313	Seattle
2013-09-02 8:27:02	Harbor Seal	<i>Phoca vitulina</i>	47.6779	-122.5993	Bainbridge
2013-09-02 8:33:50	Harbor Seal	<i>Phoca vitulina</i>	47.7151	-122.4004	Seattle
2013-09-02 8:38:20	Harbor Seal	<i>Phoca vitulina</i>	47.7276	-122.5527	Bainbridge
2013-09-02 9:02:00	Harbor Seal	<i>Phoca vitulina</i>	47.8094	-122.3946	South Whidbey
2013-09-02 9:09:39	Harbor Seal	<i>Phoca vitulina</i>	47.8442	-122.5809	Hood Canal
2013-09-02 9:12:08	Harbor Seal	<i>Phoca vitulina</i>	47.8436	-122.6818	Hood Canal
2013-09-02 9:19:16	Harbor Seal	<i>Phoca vitulina</i>	47.8772	-122.4417	South Whidbey

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-02 9:19:27	Harbor Seal	<i>Phoca vitulina</i>	47.8767	-122.4336	South Whidbey
2013-09-02 9:19:50	Harbor Seal	<i>Phoca vitulina</i>	47.8734	-122.4183	South Whidbey
2013-09-02 9:19:56	Harbor Porpoise	<i>Phocoena phocoena</i>	47.8766	-122.4138	South Whidbey
2013-09-02 9:23:02	Harbor Seal	<i>Phoca vitulina</i>	47.8874	-122.4066	South Whidbey
2013-09-02 9:23:36	Harbor Seal	<i>Phoca vitulina</i>	47.8904	-122.4288	South Whidbey
2013-09-02 9:24:01	Unidentified Porpoise	<i>Cetacean</i>	47.8851	-122.4345	South Whidbey
2013-09-02 9:26:05	Harbor Porpoise	<i>Phocoena phocoena</i>	47.8928	-122.4221	South Whidbey
2013-09-02 9:29:05	Harbor Seal	<i>Phoca vitulina</i>	47.8764	-122.3528	South Whidbey
2013-09-02 9:31:37	Harbor Seal	<i>Phoca vitulina</i>	47.9140	-122.3426	South Whidbey
2013-09-02 9:35:18	Harbor Porpoise	<i>Phocoena phocoena</i>	47.9096	-122.4892	South Whidbey
2013-09-02 9:35:30	Harbor Porpoise	<i>Phocoena phocoena</i>	47.9080	-122.4960	South Whidbey
2013-09-02 9:39:40	Harbor Porpoise	<i>Phocoena phocoena</i>	47.9133	-122.4956	South Whidbey
2013-09-02 9:43:40	Harbor Seal	<i>Phoca vitulina</i>	47.9074	-122.5923	Hood Canal
2013-09-02 9:46:20	Harbor Seal	<i>Phoca vitulina</i>	47.9368	-122.6747	Hood Canal
2013-09-02 9:46:54	Harbor Seal	<i>Phoca vitulina</i>	47.9475	-122.6779	Hood Canal
2013-09-02 9:47:04	Harbor Seal	<i>Phoca vitulina</i>	47.9449	-122.6727	Hood Canal
2013-09-02 9:46:54	Harbor Seal	<i>Phoca vitulina</i>	47.9488	-122.6803	Hood Canal
2013-09-02 9:47:13	Harbor Seal	<i>Phoca vitulina</i>	47.9491	-122.6644	Hood Canal
2013-09-02 9:47:27	Harbor Seal	<i>Phoca vitulina</i>	47.9473	-122.6545	South Whidbey
2013-09-02 9:49:16	Harbor Seal	<i>Phoca vitulina</i>	47.9450	-122.5776	South Whidbey
2013-09-02 9:49:25	Harbor Porpoise	<i>Phocoena phocoena</i>	47.9450	-122.5706	South Whidbey
2013-09-02 9:49:17	Harbor Porpoise	<i>Phocoena phocoena</i>	47.9459	-122.5776	South Whidbey
2013-09-02 9:51:37	Harbor Porpoise	<i>Phocoena phocoena</i>	47.9450	-122.5635	South Whidbey
2013-09-02 9:49:26	Harbor Porpoise	<i>Phocoena phocoena</i>	47.9450	-122.5706	South Whidbey
2013-09-02 9:57:43	Harbor Porpoise	<i>Phocoena phocoena</i>	47.9394	-122.5360	South Whidbey
2013-09-02 9:59:22	Harbor Porpoise	<i>Phocoena phocoena</i>	47.9446	-122.4652	South Whidbey
2013-09-02 10:10:00	Harbor Seal	<i>Phoca vitulina</i>	47.9747	-122.4779	South Whidbey

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-02 10:10:13	Harbor Seal	<i>Phoca vitulina</i>	47.9770	-122.4855	South Whidbey
2013-09-02 10:10:29	Harbor Seal	<i>Phoca vitulina</i>	47.9773	-122.4988	South Whidbey
2013-09-02 10:10:34	Harbor Seal	<i>Phoca vitulina</i>	47.9755	-122.5023	South Whidbey
2013-09-02 10:10:36	Harbor Seal	<i>Phoca vitulina</i>	47.9764	-122.5037	South Whidbey
2013-09-02 10:10:42	Harbor Seal	<i>Phoca vitulina</i>	47.9761	-122.5063	South Whidbey
2013-09-02 10:10:52	Harbor Seal	<i>Phoca vitulina</i>	47.9726	-122.5145	South Whidbey
2013-09-02 10:12:46	Harbor Porpoise	<i>Phocoena phocoena</i>	47.9777	-122.5890	South Whidbey
2013-09-02 10:13:58	Harbor Porpoise	<i>Phocoena phocoena</i>	47.9657	-122.5862	South Whidbey
2013-09-02 10:18:15	Harbor Seal	<i>Phoca vitulina</i>	47.9781	-122.6216	South Whidbey
2013-09-02 10:18:21	Harbor Seal	<i>Phoca vitulina</i>	47.9766	-122.6254	South Whidbey
2013-09-02 10:18:39	Harbor Seal	<i>Phoca vitulina</i>	47.9754	-122.6372	South Whidbey
2013-09-02 10:23:02	Harbor Seal	<i>Phoca vitulina</i>	48.0126	-122.6697	Admiralty Inlet
2013-09-02 10:36:00	Harbor Seal	<i>Phoca vitulina</i>	48.0458	-122.3242	East Whidbey
2013-09-02 10:36:09	Harbor Seal	<i>Phoca vitulina</i>	48.0401	-122.3305	East Whidbey
2013-09-02 10:37:57	Harbor Seal	<i>Phoca vitulina</i>	48.0392	-122.4064	East Whidbey
2013-09-02 10:45:32	California Sea Lion	<i>Zalophus californianus</i>	48.0733	-122.6790	Admiralty Inlet
2013-09-02 10:53:04	Harbor Seal	<i>Phoca vitulina</i>	48.0787	-122.5149	East Whidbey
2013-09-02 10:54:46	Harbor Seal	<i>Phoca vitulina</i>	48.0794	-122.4452	East Whidbey
2013-09-02 12:47:16	Harbor Seal	<i>Phoca vitulina</i>	48.1093	-122.3778	East Whidbey
2013-09-02 12:47:24	Harbor Seal	<i>Phoca vitulina</i>	48.1100	-122.3832	East Whidbey
2013-09-02 12:47:27	Harbor Seal	<i>Phoca vitulina</i>	48.1078	-122.3844	East Whidbey
2013-09-02 12:47:29	Harbor Seal	<i>Phoca vitulina</i>	48.1103	-122.3866	East Whidbey
2013-09-02 12:47:31	Harbor Seal	<i>Phoca vitulina</i>	48.1102	-122.3879	East Whidbey
2013-09-02 12:47:34	Harbor Seal	<i>Phoca vitulina</i>	48.1076	-122.3890	East Whidbey
2013-09-02 12:47:37	Harbor Seal	<i>Phoca vitulina</i>	48.1089	-122.3910	East Whidbey
2013-09-02 12:47:46	Harbor Seal	<i>Phoca vitulina</i>	48.1081	-122.3975	East Whidbey
2013-09-02 12:47:55	Harbor Seal	<i>Phoca vitulina</i>	48.1086	-122.4028	East Whidbey

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-02 12:51:38	Harbor Seal	<i>Phoca vitulina</i>	48.1113	-122.5526	East Whidbey
2013-09-02 12:55:25	Harbor Seal	<i>Phoca vitulina</i>	48.1099	-122.7137	Admiralty Inlet
2013-09-02 12:55:24	Harbor Seal	<i>Phoca vitulina</i>	48.1097	-122.7110	Admiralty Inlet
2013-09-02 12:55:30	Harbor Seal	<i>Phoca vitulina</i>	48.1082	-122.7144	Admiralty Inlet
2013-09-02 12:55:32	Harbor Seal	<i>Phoca vitulina</i>	48.1098	-122.7157	Admiralty Inlet
2013-09-02 12:55:40	Harbor Seal	<i>Phoca vitulina</i>	48.1098	-122.7212	Admiralty Inlet
2013-09-02 12:56:09	Harbor Seal	<i>Phoca vitulina</i>	48.1115	-122.7397	Admiralty Inlet
2013-09-02 12:56:18	Harbor Seal	<i>Phoca vitulina</i>	48.1115	-122.7465	Admiralty Inlet
2013-09-02 12:59:15	Harbor Seal	<i>Phoca vitulina</i>	48.1460	-122.7099	Admiralty Inlet
2013-09-02 12:59:22	Harbor Seal	<i>Phoca vitulina</i>	48.1468	-122.7046	Admiralty Inlet
2013-09-02 12:59:28	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1477	-122.7000	Admiralty Inlet
2013-09-02 12:59:35	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1446	-122.6947	Admiralty Inlet
2013-09-02 12:59:39	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1475	-122.6916	East Whidbey
2013-09-02 13:03:26	Harbor Seal	<i>Phoca vitulina</i>	48.1463	-122.5315	Admiralty Inlet
2013-09-02 13:00:26	Harbor Seal	<i>Phoca vitulina</i>	48.1480	-122.6578	East Whidbey
2013-09-02 13:06:15	Harbor Seal	<i>Phoca vitulina</i>	48.1471	-122.4198	East Whidbey
2013-09-02 13:07:44	Unidentified Porpoise	Cetacean	48.1447	-122.4175	East Whidbey
2013-09-02 13:10:36	Harbor Seal	<i>Phoca vitulina</i>	48.1528	-122.3988	East Whidbey
2013-09-02 13:10:46	Harbor Seal	<i>Phoca vitulina</i>	48.1608	-122.4119	East Whidbey
2013-09-02 13:13:12	Harbor Seal	<i>Phoca vitulina</i>	48.1418	-122.3958	East Whidbey
2013-09-02 13:13:21	Harbor Seal	<i>Phoca vitulina</i>	48.1432	-122.3907	East Whidbey
2013-09-02 13:13:37	Harbor Seal	<i>Phoca vitulina</i>	48.1425	-122.3796	East Whidbey
2013-09-02 13:15:35	Harbor Seal	<i>Phoca vitulina</i>	48.1788	-122.3750	East Whidbey
2013-09-02 13:15:53	Harbor Seal	<i>Phoca vitulina</i>	48.1763	-122.3847	East Whidbey
2013-09-02 13:16:01	Harbor Seal	<i>Phoca vitulina</i>	48.1746	-122.3902	East Whidbey
2013-09-02 13:16:02	Harbor Seal	<i>Phoca vitulina</i>	48.1759	-122.3909	East Whidbey
2013-09-02 13:16:09	Harbor Seal	<i>Phoca vitulina</i>	48.1748	-122.3945	East Whidbey

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-02 13:16:27	Harbor Seal	<i>Phoca vitulina</i>	48.1756	-122.4054	East Whidbey
2013-09-02 13:16:37	California Sea Lion	<i>Zalophus californianus</i>	48.1762	-122.4123	East Whidbey
2013-09-02 13:18:48	Harbor Seal	<i>Phoca vitulina</i>	48.1804	-122.4338	East Whidbey
2013-09-02 13:18:51	Harbor Seal	<i>Phoca vitulina</i>	48.1806	-122.4363	East Whidbey
2013-09-02 13:18:53	Harbor Seal	<i>Phoca vitulina</i>	48.1807	-122.4376	East Whidbey
2013-09-02 13:18:56	Harbor Seal	<i>Phoca vitulina</i>	48.1809	-122.4388	East Whidbey
2013-09-02 13:19:35	Harbor Seal	<i>Phoca vitulina</i>	48.1805	-122.4631	East Whidbey
2013-09-02 13:19:55	Harbor Seal	<i>Phoca vitulina</i>	48.1786	-122.4759	East Whidbey
2013-09-02 13:22:04	Harbor Seal	<i>Phoca vitulina</i>	48.1761	-122.5612	East Whidbey
2013-09-02 13:22:21	Harbor Seal	<i>Phoca vitulina</i>	48.1722	-122.5734	East Whidbey
2013-09-02 13:22:37	Harbor Seal	<i>Phoca vitulina</i>	48.1778	-122.5844	East Whidbey
2013-09-02 13:25:44	Harbor Seal	<i>Phoca vitulina</i>	48.1778	-122.7100	Admiralty Inlet
2013-09-02 13:26:39	Harbor Porpoise	<i>Phocoena phocoena</i>	48.1777	-122.7470	Admiralty Inlet
2013-09-02 13:28:24	Harbor Seal	<i>Phoca vitulina</i>	48.1900	-122.7208	Admiralty Inlet
2013-09-02 13:28:40	Harbor Seal	<i>Phoca vitulina</i>	48.1925	-122.7099	Admiralty Inlet
2013-09-02 13:28:39	Harbor Seal	<i>Phoca vitulina</i>	48.1929	-122.7108	Admiralty Inlet
2013-09-02 13:28:37	Harbor Seal	<i>Phoca vitulina</i>	48.1932	-122.7124	Admiralty Inlet
2013-09-02 13:32:35	Harbor Seal	<i>Phoca vitulina</i>	48.2099	-122.5468	East Whidbey
2013-09-02 13:36:09	Harbor Seal	<i>Phoca vitulina</i>	48.2105	-122.3994	East Whidbey
2013-09-02 13:36:23	Harbor Seal	<i>Phoca vitulina</i>	48.2097	-122.3907	East Whidbey
2013-09-02 13:41:36	Harbor Seal	<i>Phoca vitulina</i>	48.2432	-122.5488	East Whidbey
2013-09-02 13:41:39	Harbor Seal	<i>Phoca vitulina</i>	48.2406	-122.5501	East Whidbey
2013-09-02 13:42:45	Harbor Seal	<i>Phoca vitulina</i>	48.2406	-122.5947	East Whidbey
2013-09-02 13:44:20	Harbor Seal	<i>Phoca vitulina</i>	48.2408	-122.6576	East Whidbey
2013-09-02 13:46:16	Harbor Seal	<i>Phoca vitulina</i>	48.2675	-122.6380	East Whidbey
2013-09-02 13:46:50	Harbor Seal	<i>Phoca vitulina</i>	48.2780	-122.6198	East Whidbey
2013-09-02 13:47:06	Harbor Seal	<i>Phoca vitulina</i>	48.2809	-122.6109	East Whidbey

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-02 13:49:47	Harbor Seal	<i>Phoca vitulina</i>	48.2787	-122.4997	East Whidbey
2013-09-02 13:54:53	Harbor Seal	<i>Phoca vitulina</i>	48.3112	-122.4216	East Whidbey
2013-09-02 13:56:48	Harbor Seal	<i>Phoca vitulina</i>	48.3095	-122.4987	East Whidbey
2013-09-02 14:00:44	Harbor Seal	<i>Phoca vitulina</i>	48.3387	-122.4842	East Whidbey
2013-09-02 14:00:56	Harbor Seal	<i>Phoca vitulina</i>	48.3429	-122.4740	East Whidbey
2013-09-02 14:01:10	Harbor Seal	<i>Phoca vitulina</i>	48.3424	-122.4639	East Whidbey
2013-09-02 14:04:03	Harbor Seal	<i>Phoca vitulina</i>	48.3726	-122.5255	East Whidbey
2013-09-02 14:04:49	Harbor Seal	<i>Phoca vitulina</i>	48.3780	-122.5583	East Whidbey
2013-09-02 14:05:01	Harbor Seal	<i>Phoca vitulina</i>	48.3743	-122.5668	East Whidbey
2013-09-02 14:15:50	Harbor Seal	<i>Phoca vitulina</i>	48.2805	-122.6055	East Whidbey
2013-09-02 14:17:00	California Sea Lion	<i>Zalophus californianus</i>	48.2478	-122.6255	East Whidbey
2013-09-02 14:20:46	Unidentified Pinniped	Pinniped	48.1440	-122.6530	Hood Canal
2013-09-02 14:31:57	Harbor Seal	<i>Phoca vitulina</i>	48.0219	-122.6566	Hood Canal
2013-09-02 14:42:32	Harbor Seal	<i>Phoca vitulina</i>	47.7770	-122.8488	Hood Canal
2013-09-02 14:44:34	Harbor Seal	<i>Phoca vitulina</i>	47.7419	-122.8446	Hood Canal
2013-09-02 14:45:19	Harbor Seal	<i>Phoca vitulina</i>	47.7450	-122.8120	Hood Canal
2013-09-02 14:47:17	Harbor Seal	<i>Phoca vitulina</i>	47.7121	-122.8317	Hood Canal
2013-09-02 14:47:43	Harbor Seal	<i>Phoca vitulina</i>	47.7133	-122.8478	Hood Canal
2013-09-02 14:47:50	Harbor Seal	<i>Phoca vitulina</i>	47.7115	-122.8515	Hood Canal
2013-09-02 14:48:24	Harbor Seal	<i>Phoca vitulina</i>	47.7125	-122.8722	Hood Canal
2013-09-02 14:50:51	Harbor Seal	<i>Phoca vitulina</i>	47.6754	-122.8809	Hood Canal
2013-09-02 14:50:55	Harbor Seal	<i>Phoca vitulina</i>	47.6739	-122.8777	Hood Canal
2013-09-02 14:51:10	Harbor Seal	<i>Phoca vitulina</i>	47.6747	-122.8664	Hood Canal
2013-09-02 14:51:33	Harbor Seal	<i>Phoca vitulina</i>	47.6747	-122.8486	Hood Canal
2013-09-02 14:52:16	Harbor Seal	<i>Phoca vitulina</i>	47.6785	-122.8167	Hood Canal
2013-09-02 14:52:30	Harbor Seal	<i>Phoca vitulina</i>	47.6778	-122.8073	Hood Canal
2013-09-02 14:52:33	Harbor Seal	<i>Phoca vitulina</i>	47.6752	-122.8049	Hood Canal

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-02 14:52:36	Harbor Seal	<i>Phoca vitulina</i>	47.6779	-122.8032	Hood Canal
2013-09-02 14:52:57	Harbor Seal	<i>Phoca vitulina</i>	47.6804	-122.7891	Hood Canal
2013-09-02 14:55:56	Harbor Seal	<i>Phoca vitulina</i>	47.6560	-122.7951	Hood Canal
2013-09-02 14:56:41	Harbor Seal	<i>Phoca vitulina</i>	47.6511	-122.8229	Hood Canal
2013-09-02 15:09:51	Harbor Seal	<i>Phoca vitulina</i>	47.5485	-123.0426	Hood Canal
2013-09-02 15:14:46	Harbor Seal	<i>Phoca vitulina</i>	47.5075	-123.0449	Hood Canal
2013-09-02 15:15:06	Harbor Seal	<i>Phoca vitulina</i>	47.5102	-123.0564	Hood Canal
2013-09-02 15:17:34	Harbor Seal	<i>Phoca vitulina</i>	47.4763	-123.0539	Hood Canal
2013-09-02 15:37:03	California Sea Lion	<i>Zalophus californianus</i>	47.3434	-123.1167	Hood Canal
2013-09-02 15:53:14	Harbor Seal	<i>Phoca vitulina</i>	47.1471	-122.7311	Southern Puget Sound
2013-09-02 15:53:48	Harbor Seal	<i>Phoca vitulina</i>	47.1445	-122.7060	Southern Puget Sound
2013-09-02 15:55:25	Harbor Seal	<i>Phoca vitulina</i>	47.1490	-122.6381	Southern Puget Sound
2013-09-02 15:56:03	Harbor Seal	<i>Phoca vitulina</i>	47.1550	-122.6228	Southern Puget Sound
2013-09-02 15:58:03	Harbor Seal	<i>Phoca vitulina</i>	47.2099	-122.5828	Southern Puget Sound
2013-09-02 15:59:53	Harbor Seal	<i>Phoca vitulina</i>	47.2541	-122.5794	Southern Puget Sound
2013-09-02 15:59:58	Harbor Seal	<i>Phoca vitulina</i>	47.2514	-122.5817	Southern Puget Sound
2013-09-02 16:04:32	Harbor Seal	<i>Phoca vitulina</i>	47.2749	-122.6841	Southern Puget Sound
2013-09-02 16:04:40	Harbor Seal	<i>Phoca vitulina</i>	47.2830	-122.6779	Southern Puget Sound
2013-09-02 16:04:59	Harbor Seal	<i>Phoca vitulina</i>	47.2779	-122.6620	Southern Puget Sound
2013-09-02 16:05:30	Harbor Seal	<i>Phoca vitulina</i>	47.2770	-122.6384	Southern Puget Sound
2013-09-02 16:07:51	Harbor Seal	<i>Phoca vitulina</i>	47.2792	-122.5353	Southern Puget Sound
2013-09-02 16:09:25	Harbor Seal	<i>Phoca vitulina</i>	47.2799	-122.4645	Vashon
2013-09-02 16:09:55	Harbor Seal	<i>Phoca vitulina</i>	47.2790	-122.4414	Vashon
2013-09-02 16:10:09	Harbor Seal	<i>Phoca vitulina</i>	47.2764	-122.4311	Vashon
2013-09-02 16:10:14	Harbor Seal	<i>Phoca vitulina</i>	47.2796	-122.4268	Vashon
2013-09-02 16:10:28	Harbor Seal	<i>Phoca vitulina</i>	47.2772	-122.4173	Vashon
2013-09-02 16:10:59	Harbor Seal	<i>Phoca vitulina</i>	47.2804	-122.4152	Vashon

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-02 16:11:26	Harbor Seal	<i>Phoca vitulina</i>	47.2942	-122.4197	Vashon
2013-09-02 16:11:37	Harbor Seal	<i>Phoca vitulina</i>	47.2996	-122.4203	Vashon
2013-09-02 16:13:02	Harbor Seal	<i>Phoca vitulina</i>	47.3105	-122.4678	Vashon
2013-09-02 16:16:44	Harbor Seal	<i>Phoca vitulina</i>	47.3358	-122.5250	Vashon
2013-09-02 16:18:04	Harbor Seal	<i>Phoca vitulina</i>	47.3404	-122.4664	Vashon
2013-09-02 16:20:11	Harbor Seal	<i>Phoca vitulina</i>	47.3480	-122.3758	Vashon
2013-09-02 16:24:11	Harbor Seal	<i>Phoca vitulina</i>	47.3780	-122.4049	Vashon
2013-09-02 16:35:59	Harbor Seal	<i>Phoca vitulina</i>	47.4727	-122.4335	Vashon
2013-09-02 16:37:15	Harbor Seal	<i>Phoca vitulina</i>	47.4749	-122.3813	Vashon
2013-09-02 16:40:48	Harbor Seal	<i>Phoca vitulina</i>	47.5103	-122.4505	Vashon
2013-09-02 16:42:05	Harbor Seal	<i>Phoca vitulina</i>	47.5172	-122.4964	Vashon
2013-09-02 16:54:23	Harbor Seal	<i>Phoca vitulina</i>	47.6101	-122.4800	Seattle
2013-09-02 16:57:41	Harbor Seal	<i>Phoca vitulina</i>	47.6179	-122.3631	Seattle
2013-09-02 16:59:16	Harbor Seal	<i>Phoca vitulina</i>	47.6108	-122.4181	Seattle
2013-09-03 14:40:54	Harbor Seal	<i>Phoca vitulina</i>	47.2122	-122.6339	Southern Puget Sound
2013-09-03 14:40:56	Harbor Seal	<i>Phoca vitulina</i>	47.2115	-122.6333	Southern Puget Sound
2013-09-03 14:41:03	Harbor Seal	<i>Phoca vitulina</i>	47.2068	-122.6295	Southern Puget Sound
2013-09-03 14:41:43	Harbor Seal	<i>Phoca vitulina</i>	47.1850	-122.6416	Southern Puget Sound
2013-09-03 14:42:22	Harbor Seal	<i>Phoca vitulina</i>	47.1650	-122.6460	Southern Puget Sound
2013-09-03 14:42:42	Harbor Seal	<i>Phoca vitulina</i>	47.1563	-122.6540	Southern Puget Sound
2013-09-03 14:42:46	Harbor Seal	<i>Phoca vitulina</i>	47.1541	-122.6522	Southern Puget Sound
2013-09-03 14:43:34	Harbor Seal	<i>Phoca vitulina</i>	47.1331	-122.6617	Southern Puget Sound
2013-09-03 14:43:39	Harbor Seal	<i>Phoca vitulina</i>	47.1307	-122.6618	Southern Puget Sound
2013-09-03 14:44:41	Harbor Seal	<i>Phoca vitulina</i>	47.1095	-122.6786	Southern Puget Sound
2013-09-03 14:44:56	Harbor Seal	<i>Phoca vitulina</i>	47.1093	-122.6913	Southern Puget Sound
2013-09-03 14:45:05	Harbor Seal	<i>Phoca vitulina</i>	47.1106	-122.6960	Southern Puget Sound
2013-09-03 14:45:09	Harbor Seal	<i>Phoca vitulina</i>	47.1077	-122.6999	Southern Puget Sound

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-03 14:45:11	Harbor Seal	<i>Phoca vitulina</i>	47.1080	-122.7012	Southern Puget Sound
2013-09-03 14:45:16	Harbor Seal	<i>Phoca vitulina</i>	47.1085	-122.7037	Southern Puget Sound
2013-09-03 14:45:26	Harbor Seal	<i>Phoca vitulina</i>	47.1042	-122.7108	Southern Puget Sound
2013-09-03 14:45:29	Harbor Seal	<i>Phoca vitulina</i>	47.1107	-122.7130	Southern Puget Sound
2013-09-03 14:50:09	Harbor Seal	<i>Phoca vitulina</i>	47.1141	-122.9015	Southern Puget Sound
2013-09-03 14:50:18	Harbor Seal	<i>Phoca vitulina</i>	47.1137	-122.9070	Southern Puget Sound
2013-09-03 14:56:43	Harbor Seal	<i>Phoca vitulina</i>	47.1128	-123.0182	Southern Puget Sound
2013-09-03 14:59:29	Harbor Seal	<i>Phoca vitulina</i>	47.1449	-122.9219	Southern Puget Sound
2013-09-03 15:00:00	Harbor Seal	<i>Phoca vitulina</i>	47.1452	-122.9026	Southern Puget Sound
2013-09-03 15:01:39	Harbor Seal	<i>Phoca vitulina</i>	47.1444	-122.8412	Southern Puget Sound
2013-09-03 15:01:41	Harbor Seal	<i>Phoca vitulina</i>	47.1442	-122.8400	Southern Puget Sound
2013-09-03 15:05:27	Harbor Seal	<i>Phoca vitulina</i>	47.1436	-122.6934	Southern Puget Sound
2013-09-03 15:06:10	Harbor Seal	<i>Phoca vitulina</i>	47.1441	-122.6651	Southern Puget Sound
2013-09-03 15:07:07	Harbor Seal	<i>Phoca vitulina</i>	47.1475	-122.6293	Southern Puget Sound
2013-09-03 15:09:13	Harbor Seal	<i>Phoca vitulina</i>	47.1828	-122.6156	Southern Puget Sound
2013-09-03 15:09:23	Harbor Seal	<i>Phoca vitulina</i>	47.1819	-122.6223	Southern Puget Sound
2013-09-03 15:10:20	Harbor Seal	<i>Phoca vitulina</i>	47.1774	-122.6591	Southern Puget Sound
2013-09-03 15:13:40	Harbor Seal	<i>Phoca vitulina</i>	47.1758	-122.7317	Southern Puget Sound
2013-09-03 15:14:01	Harbor Seal	<i>Phoca vitulina</i>	47.1732	-122.7464	Southern Puget Sound
2013-09-03 15:15:14	Harbor Seal	<i>Phoca vitulina</i>	47.1773	-122.7962	Southern Puget Sound
2013-09-03 15:16:17	Harbor Seal	<i>Phoca vitulina</i>	47.1765	-122.8352	Southern Puget Sound
2013-09-03 15:17:37	Harbor Seal	<i>Phoca vitulina</i>	47.1752	-122.8874	Southern Puget Sound
2013-09-03 15:22:46	Harbor Seal	<i>Phoca vitulina</i>	47.2124	-122.8091	Southern Puget Sound
2013-09-03 15:27:02	Harbor Seal	<i>Phoca vitulina</i>	47.2119	-122.6392	Southern Puget Sound
2013-09-03 15:27:05	Harbor Seal	<i>Phoca vitulina</i>	47.2137	-122.6377	Southern Puget Sound
2013-09-03 15:27:22	Harbor Seal	<i>Phoca vitulina</i>	47.2158	-122.6261	Southern Puget Sound
2013-09-03 15:27:51	Harbor Seal	<i>Phoca vitulina</i>	47.2111	-122.6082	Southern Puget Sound

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-03 15:28:07	Harbor Seal	<i>Phoca vitulina</i>	47.2131	-122.5984	Southern Puget Sound
2013-09-03 15:29:40	Harbor Seal	<i>Phoca vitulina</i>	47.2351	-122.5673	Southern Puget Sound
2013-09-03 15:30:18	Harbor Seal	<i>Phoca vitulina</i>	47.2448	-122.5642	Southern Puget Sound
2013-09-03 15:32:16	Harbor Seal	<i>Phoca vitulina</i>	47.2455	-122.6513	Southern Puget Sound
2013-09-03 15:32:28	Harbor Seal	<i>Phoca vitulina</i>	47.2440	-122.6594	Southern Puget Sound
2013-09-03 15:32:39	Harbor Seal	<i>Phoca vitulina</i>	47.2439	-122.6661	Southern Puget Sound
2013-09-03 15:32:49	Harbor Seal	<i>Phoca vitulina</i>	47.2442	-122.6736	Southern Puget Sound
2013-09-03 15:33:09	Harbor Seal	<i>Phoca vitulina</i>	47.2441	-122.6863	Southern Puget Sound
2013-09-03 15:33:17	Harbor Seal	<i>Phoca vitulina</i>	47.2473	-122.6924	Southern Puget Sound
2013-09-03 15:33:57	Harbor Seal	<i>Phoca vitulina</i>	47.2449	-122.7192	Southern Puget Sound
2013-09-03 15:34:07	Harbor Seal	<i>Phoca vitulina</i>	47.2426	-122.7256	Southern Puget Sound
2013-09-03 15:36:55	Harbor Seal	<i>Phoca vitulina</i>	47.2479	-122.8402	Southern Puget Sound
2013-09-03 15:37:04	Harbor Seal	<i>Phoca vitulina</i>	47.2457	-122.8479	Southern Puget Sound
2013-09-03 15:39:59	Harbor Seal	<i>Phoca vitulina</i>	47.2793	-122.8410	Southern Puget Sound
2013-09-03 15:42:42	Harbor Seal	<i>Phoca vitulina</i>	47.2770	-122.7312	Southern Puget Sound
2013-09-03 15:43:02	Harbor Seal	<i>Phoca vitulina</i>	47.2778	-122.7169	Southern Puget Sound
2013-09-03 15:43:07	Harbor Seal	<i>Phoca vitulina</i>	47.2760	-122.7132	Southern Puget Sound
2013-09-03 15:43:11	Harbor Seal	<i>Phoca vitulina</i>	47.2761	-122.7106	Southern Puget Sound
2013-09-03 15:43:14	Harbor Seal	<i>Phoca vitulina</i>	47.2776	-122.7086	Southern Puget Sound
2013-09-03 15:43:15	Harbor Seal	<i>Phoca vitulina</i>	47.2786	-122.7080	Southern Puget Sound
2013-09-03 15:43:21	Harbor Seal	<i>Phoca vitulina</i>	47.2792	-122.7038	Southern Puget Sound
2013-09-03 15:43:23	Harbor Seal	<i>Phoca vitulina</i>	47.2784	-122.7024	Southern Puget Sound
2013-09-03 15:43:28	Harbor Seal	<i>Phoca vitulina</i>	47.2774	-122.6990	Southern Puget Sound
2013-09-03 15:43:31	Harbor Seal	<i>Phoca vitulina</i>	47.2793	-122.6969	Southern Puget Sound
2013-09-03 15:43:36	Harbor Seal	<i>Phoca vitulina</i>	47.2792	-122.6934	Southern Puget Sound
2013-09-03 15:43:42	Harbor Porpoise	<i>Phocoena phocoena</i>	47.2785	-122.6892	Southern Puget Sound
2013-09-03 15:50:34	Harbor Seal	<i>Phoca vitulina</i>	47.2782	-122.5916	Southern Puget Sound

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-03 15:52:01	Harbor Seal	<i>Phoca vitulina</i>	47.2778	-122.5351	Southern Puget Sound
2013-09-03 15:52:15	Harbor Seal	<i>Phoca vitulina</i>	47.2784	-122.5260	Southern Puget Sound
2013-09-03 15:54:00	Harbor Seal	<i>Phoca vitulina</i>	47.2780	-122.4547	Vashon
2013-09-03 15:54:36	Harbor Seal	<i>Phoca vitulina</i>	47.2760	-122.4303	Vashon
2013-09-03 15:54:48	Harbor Seal	<i>Phoca vitulina</i>	47.2751	-122.4236	Vashon
2013-09-03 15:55:21	Harbor Seal	<i>Phoca vitulina</i>	47.2792	-122.4110	Vashon
2013-09-03 15:55:39	Harbor Seal	<i>Phoca vitulina</i>	47.2903	-122.4130	Vashon
2013-09-03 15:55:47	Harbor Seal	<i>Phoca vitulina</i>	47.2915	-122.4145	Vashon
2013-09-03 15:55:52	Harbor Seal	<i>Phoca vitulina</i>	47.2949	-122.4176	Vashon
2013-09-03 15:57:11	Harbor Seal	<i>Phoca vitulina</i>	47.3066	-122.4598	Vashon
2013-09-03 15:57:33	Harbor Seal	<i>Phoca vitulina</i>	47.3092	-122.4760	Vashon
2013-09-03 15:58:16	Harbor Seal	<i>Phoca vitulina</i>	47.3122	-122.5047	Vashon
2013-09-03 15:58:28	Harbor Seal	<i>Phoca vitulina</i>	47.3096	-122.5164	Vashon
2013-09-03 15:58:30	Harbor Seal	<i>Phoca vitulina</i>	47.3065	-122.5178	Vashon
2013-09-03 16:02:45	Unidentified Small Marine Mammal	Cetacean or Pinniped	47.3135	-122.6940	Southern Puget Sound
2013-09-03 16:02:47	Harbor Seal	<i>Phoca vitulina</i>	47.3080	-122.6941	Southern Puget Sound
2013-09-03 16:02:57	Harbor Seal	<i>Phoca vitulina</i>	47.3069	-122.7026	Southern Puget Sound
2013-09-03 16:03:04	Harbor Seal	<i>Phoca vitulina</i>	47.3074	-122.7074	Southern Puget Sound
2013-09-03 16:03:09	Harbor Seal	<i>Phoca vitulina</i>	47.3103	-122.7110	Southern Puget Sound
2013-09-03 16:03:20	Harbor Seal	<i>Phoca vitulina</i>	47.3083	-122.7183	Southern Puget Sound
2013-09-03 16:03:32	Harbor Seal	<i>Phoca vitulina</i>	47.3088	-122.7266	Southern Puget Sound
2013-09-03 16:03:40	Harbor Seal	<i>Phoca vitulina</i>	47.3097	-122.7321	Southern Puget Sound
2013-09-03 16:03:52	Harbor Seal	<i>Phoca vitulina</i>	47.3111	-122.7397	Southern Puget Sound
2013-09-03 16:06:31	Harbor Seal	<i>Phoca vitulina</i>	47.3109	-122.8483	Southern Puget Sound
2013-09-03 16:08:34	Harbor Seal	<i>Phoca vitulina</i>	47.3456	-122.8177	Southern Puget Sound
2013-09-03 16:08:51	Harbor Seal	<i>Phoca vitulina</i>	47.3451	-122.8051	Southern Puget Sound
2013-09-03 16:11:19	Harbor Seal	<i>Phoca vitulina</i>	47.3464	-122.7049	Southern Puget Sound

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-03 16:36:51	Harbor Seal	<i>Phoca vitulina</i>	47.3772	-122.4115	Vashon
2013-09-03 16:38:42	Harbor Seal	<i>Phoca vitulina</i>	47.3776	-122.4844	Vashon
2013-09-03 16:41:27	Harbor Seal	<i>Phoca vitulina</i>	47.4102	-122.5337	Vashon
2013-09-03 16:47:14	Harbor Seal	<i>Phoca vitulina</i>	47.4277	-122.3583	Vashon
2013-09-03 17:05:30	Harbor Seal	<i>Phoca vitulina</i>	47.5368	-122.6666	Bainbridge
2013-09-03 17:09:50	Harbor Seal	<i>Phoca vitulina</i>	47.5464	-122.4903	Vashon
2013-09-03 17:10:01	Harbor Seal	<i>Phoca vitulina</i>	47.5445	-122.4829	Vashon
2013-09-03 17:10:59	Unidentified Small Marine Mammal	Cetacean or Pinniped	47.5419	-122.4441	Vashon
2013-09-03 17:12:14	Harbor Seal	<i>Phoca vitulina</i>	47.5317	-122.4550	Vashon
2013-09-03 17:18:19	California Sea Lion	<i>Zalophus californianus</i>	47.5751	-122.4548	Vashon
2013-09-03 17:19:14	California Sea Lion	<i>Zalophus californianus</i>	47.5760	-122.4965	Vashon
2013-09-03 17:20:10	Harbor Seal	<i>Phoca vitulina</i>	47.5777	-122.5355	Bainbridge
2013-09-03 17:28:19	Harbor Seal	<i>Phoca vitulina</i>	47.6141	-122.6887	Bainbridge
2013-09-03 17:33:29	Harbor Seal	<i>Phoca vitulina</i>	47.6156	-122.4750	Seattle
2013-09-03 17:33:34	Harbor Seal	<i>Phoca vitulina</i>	47.6132	-122.4714	Seattle
2013-09-03 17:34:25	Harbor Seal	<i>Phoca vitulina</i>	47.6110	-122.4363	Seattle
2013-09-03 17:34:45	Harbor Porpoise	<i>Phocoena phocoena</i>	47.6138	-122.4236	Seattle
2013-09-03 17:39:27	Unidentified Pinniped	Pinniped	47.6413	-122.4648	Seattle
2013-09-03 17:39:46	Harbor Seal	<i>Phoca vitulina</i>	47.6420	-122.4792	Seattle
2013-09-03 17:42:18	Harbor Seal	<i>Phoca vitulina</i>	47.6443	-122.5885	Bainbridge
2013-09-03 17:42:24	Harbor Seal	<i>Phoca vitulina</i>	47.6445	-122.5907	Bainbridge
2013-09-03 17:47:00	Harbor Seal	<i>Phoca vitulina</i>	47.6790	-122.4932	Seattle
2013-09-03 17:47:34	Harbor Seal	<i>Phoca vitulina</i>	47.6791	-122.4705	Seattle
2013-09-03 17:48:02	Harbor Porpoise	<i>Phocoena phocoena</i>	47.6794	-122.4517	Seattle
2013-09-03 17:49:47	Unidentified Pinniped	Pinniped	47.6758	-122.4307	Seattle
2013-09-03 17:53:37	Harbor Porpoise	<i>Phocoena phocoena</i>	47.7137	-122.4560	Seattle
2013-09-03 18:00:27	Unidentified Small Marine Mammal	Cetacean or Pinniped	47.7475	-122.4050	Seattle

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-03 18:03:35	Harbor Porpoise	<i>Phocoena phocoena</i>	47.7425	-122.3814	Seattle
2013-09-03 18:04:25	California Sea Lion	<i>Zalophus californianus</i>	47.7630	-122.3838	Seattle
2013-09-03 18:15:12	Harbor Seal	<i>Phoca vitulina</i>	47.8135	-122.6672	Hood Canal
2013-09-03 18:19:52	Harbor Seal	<i>Phoca vitulina</i>	47.8095	-122.4702	Seattle
2013-09-03 18:20:01	Harbor Porpoise	<i>Phocoena phocoena</i>	47.8115	-122.4638	Seattle
2013-09-03 18:20:28	Harbor Porpoise	<i>Phocoena phocoena</i>	47.8023	-122.4541	Seattle
2013-09-03 18:21:51	Harbor Porpoise	<i>Phocoena phocoena</i>	47.8059	-122.4381	Seattle
2013-09-03 18:22:01	Harbor Porpoise	<i>Phocoena phocoena</i>	47.8100	-122.4311	Seattle
2013-09-03 18:22:05	Harbor Porpoise	<i>Phocoena phocoena</i>	47.8055	-122.4289	Seattle
2013-09-03 18:22:25	Harbor Porpoise	<i>Phocoena phocoena</i>	47.8093	-122.4150	Seattle
2013-09-03 18:25:02	Harbor Porpoise	<i>Phocoena phocoena</i>	47.7527	-122.4289	Seattle
2013-09-03 18:26:07	Harbor Porpoise	<i>Phocoena phocoena</i>	47.7189	-122.4480	Seattle
2013-09-03 18:28:03	California Sea Lion	<i>Zalophus californianus</i>	47.6561	-122.4649	Seattle
2013-09-03 18:28:21	Harbor Seal	<i>Phoca vitulina</i>	47.6464	-122.4667	Seattle
2013-09-03 18:29:23	Unidentified Small Marine Mammal	Cetacean or Pinniped	47.6131	-122.4714	Seattle
2013-09-04 8:51:34	Harbor Seal	<i>Phoca vitulina</i>	47.5945	-122.4801	Seattle
2013-09-04 8:53:23	Harbor Porpoise	<i>Phocoena phocoena</i>	47.6433	-122.4590	Seattle
2013-09-04 8:54:56	Harbor Porpoise	<i>Phocoena phocoena</i>	47.6846	-122.4464	Seattle
2013-09-04 8:55:15	Harbor Seal	<i>Phoca vitulina</i>	47.6928	-122.4426	Seattle
2013-09-04 8:55:22	Harbor Seal	<i>Phoca vitulina</i>	47.6956	-122.4402	Seattle
2013-09-04 8:55:31	Harbor Seal	<i>Phoca vitulina</i>	47.6994	-122.4383	Seattle
2013-09-04 8:56:50	Risso's Dolphin	<i>Grampus griseus</i>	47.7331	-122.4226	Seattle
2013-09-04 9:04:18	Harbor Seal	<i>Phoca vitulina</i>	47.7085	-122.3995	Seattle
2013-09-04 9:05:25	Harbor Seal	<i>Phoca vitulina</i>	47.7085	-122.4449	Seattle
2013-09-04 9:06:48	Harbor Seal	<i>Phoca vitulina</i>	47.7092	-122.4986	Seattle
2013-09-04 9:07:02	Unidentified Small Marine Mammal	Cetacean or Pinniped	47.7108	-122.5068	Seattle
2013-09-04 9:07:30	Harbor Seal	<i>Phoca vitulina</i>	47.7113	-122.5249	Bainbridge

Date & Time*	Species Common Name	Species Scientific Name	Latitude (°N)	Longitude (°W)	Survey Subregion
2013-09-04 9:07:43	Harbor Seal	<i>Phoca vitulina</i>	47.7110	-122.5341	Bainbridge
2013-09-04 9:10:53	Harbor Seal	<i>Phoca vitulina</i>	47.6783	-122.5765	Bainbridge
2013-09-04 9:13:46	Harbor Seal	<i>Phoca vitulina</i>	47.6756	-122.4524	Seattle
2013-09-04 9:16:36	Harbor Seal	<i>Phoca vitulina</i>	47.6435	-122.4937	Seattle
2013-09-04 9:16:45	Harbor Seal	<i>Phoca vitulina</i>	47.6423	-122.5004	Seattle
2013-09-04 9:18:22	Harbor Seal	<i>Phoca vitulina</i>	47.6148	-122.4935	Seattle
2013-09-04 9:18:32	Unidentified Small Marine Mammal	Cetacean or Pinniped	47.6150	-122.4866	Seattle
2013-09-04 9:19:22	Harbor Seal	<i>Phoca vitulina</i>	47.6142	-122.4525	Seattle
2013-09-04 9:26:04	Harbor Seal	<i>Phoca vitulina</i>	47.5787	-122.5342	Bainbridge
2013-09-04 9:34:16	Harbor Seal	<i>Phoca vitulina</i>	47.5098	-122.4965	Vashon
2013-09-04 9:48:01	Harbor Seal	<i>Phoca vitulina</i>	47.3778	-122.3803	Vashon
2013-09-04 9:48:10	Harbor Seal	<i>Phoca vitulina</i>	47.3780	-122.3863	Vashon
2013-09-04 9:50:18	Harbor Seal	<i>Phoca vitulina</i>	47.3731	-122.4684	Vashon
2013-09-04 9:51:11	Harbor Seal	<i>Phoca vitulina</i>	47.3625	-122.4878	Vashon
2013-09-04 9:51:17	Harbor Seal	<i>Phoca vitulina</i>	47.3596	-122.4855	Vashon
2013-09-04 9:51:50	Harbor Seal	<i>Phoca vitulina</i>	47.3503	-122.4897	Vashon
2013-09-04 10:00:24	Harbor Seal	<i>Phoca vitulina</i>	47.3106	-122.4912	Vashon
2013-09-04 10:00:45	Harbor Seal	<i>Phoca vitulina</i>	47.3132	-122.5058	Vashon
2013-09-04 10:00:52	Harbor Seal	<i>Phoca vitulina</i>	47.3153	-122.5095	Vashon
2013-09-04 10:00:54	Harbor Seal	<i>Phoca vitulina</i>	47.3186	-122.5059	Vashon
2013-09-04 10:00:59	Harbor Seal	<i>Phoca vitulina</i>	47.3182	-122.5112	Vashon
2013-09-04 10:01:03	Harbor Seal	<i>Phoca vitulina</i>	47.3197	-122.5139	Vashon
2013-09-04 10:02:21	Harbor Seal	<i>Phoca vitulina</i>	47.3072	-122.4773	Vashon
2013-09-04 10:02:01	Harbor Seal	<i>Phoca vitulina</i>	47.3155	-122.4857	Vashon
2013-09-04 10:02:35	Harbor Porpoise	<i>Phocoena phocoena</i>	47.3011	-122.4717	Vashon
2013-09-04 10:02:37	Harbor Seal	<i>Phoca vitulina</i>	47.3003	-122.4735	Vashon

*Listed in Chronological Order.

Table 5. Number of Marine Mammal Sightings Observed by Survey Subregion during Puget Sound Marine Mammal Aerial Surveys 30 August–4 September 2013.

Survey Subregion	Number of Sightings	Percent of Total Sightings
Southern Puget Sound	275	35
Hood Canal	130	17
East Whidbey	106	14
Vashon	87	11
Admiralty Inlet	68	9
Seattle	55	7
South Whidbey	44	6
Bainbridge	14	1
Total	779	100

Table 6. Sightings per unit effort (SPUE) (per kilometer of all flight track effort*) of marine mammal groups by species during Puget Sound Marine Mammal Aerial Surveys 30 August–4 September 2013. These rates are meant to provide a gross measure of SPUE and should not be used for density reference.

Species (Common Name)	East Whidbey		Admiralty Inlet		South Whidbey		Hood Canal		Bainbridge		Seattle		Vashon		Southern Puget Sound		Total	
	Total No. of Grp	Grp / 10 km*	Total No. of Grp	Grp / 10 km	Total No. of Grp	Grp / 10 km	Total No. of Grp	Grp / 10 km	Total No. of Grp	Grp / 10 km	Total No. of Grp	Grp / 10 km	Total No. of Grp	Grp / 10 km	Total No. of Grp	Grp / 10 km	Total No. of Grp	Grp / 10 km
Dolphins																		
Harbor Porpoise	3	0.04	19	0.5	14	0.4	4	0.09	0	0	15	0.4	2	0.02	9	0.1	66	0.2
Risso's Dolphin	0	0	0	0	0	0	0	0	0	0	1	0.03	1	0.01	0	0	2	0.005
Unidentified Porpoise	1	0.01	1	0.03	1	0.03	1	0.02	0	0	0	0	0	0	1	0.01	5	0.01
Pinnipeds																		
California Sea Lion	2	0.03	2	0.05	0	0	2	0.05	0	0	4	0.1	3	0.03	2	0.02	15	0.04
Harbor Seal	100	1.4	45	1.2	29	0.9	121	2.8	14	1.1	27	0.7	79	0.9	260	3.2	675	1.7
Unidentified Pinniped	0	0	0	0	0	0	1	0.02	0	0	3	0.08	0	0	0	0	4	0.01
Unidentifieds																		
Unidentified Marine Mammal	0	0	1	0.03	0	0	0	0	0	0	1	0.03	0	0	2	0.02	4	0.01
Unidentified Medium Marine Mammal	0	0	0	0	0	0	0	0	0	0	0	0	1	0.01	0	0	1	0.002
Unidentified Small Marine Mammal	0	0	0	0	0	0	1	0.02	0	0	4	0.1	1	0.01	1	0.01	7	0.02
Overall Marine Mammal	106	1.5	68	1.8	44	1.4	130	3.0	14	1.1	55	1.5	87	1.0	275	3.3	779	1.9

*km = kilometers

*Effort includes all leg-type efforts as follows: systematic line-transect, connector (shorter legs between systematic lines), transit (point-to-point movement), and circling (circling a sighting for photographs).

Table 7. Number of kilometers of all flight effort by Beaufort sea state (Bf) and Survey Subregion during Puget Sound Marine Mammal Aerial Surveys 30 August–4 September 2013.

Bf	East Whidbey	Admiralty Inlet	South Whidbey	Hood Canal	Bainbridge	Seattle	Vashon	Southern Puget Sound	Total	Percent of Total Sightings
0	87	19	2	41	8	2	121	119	398	13
1	209	79	61	166	74	87	323	380	1379	46
2	100	77	67	72	6	44	103	55	524	18
3	170	24	89	44	4	111	128	62	632	21
4	26	1	18	0	0	0	20	3	68	2

Table 8. Number of Harbor Porpoise Sightings by Survey Subregion during Puget Sound Marine Mammal Aerial Surveys 30 August–4 September 2013.

Survey Area	Number of Sightings	Percent of Total Sightings
Admiralty Inlet	19	30
Seattle	15	22
South Whidbey	14	22
Southern Puget Sound	9	13
Hood Canal	4	6
East Whidbey	3	4
Vashon	2	3
Bainbridge	0	0
Total	66	100

Table 9. Summary of Harbor Porpoise Sightings during Puget Sound Marine Mammal Aerial Surveys 30 August–4 September 2013.

Date and Time	Species	Initial Sighting Behavior State	Best Count	No. of Calves	Leg Type	Latitude (°North)	Longitude (°West)
2013-08-30 10:41:23	Harbor Porpoise	Fast Travel	1		Systematic	48.1496	-122.7031
2013-08-30 10:51:34	Harbor Porpoise	Medium Travel	10		Systematic	48.1075	-122.6722
2013-08-30 10:53:26	Harbor Porpoise	Mill	2		Systematic	48.1047	-122.6788
2013-08-30 10:57:42	Harbor Porpoise	Medium Travel	2		Systematic	48.1109	-122.6344
2013-08-30 10:58:34	Harbor Porpoise		1		Systematic	48.1077	-122.6027
2013-08-30 12:01:55	Harbor Porpoise	Medium Travel	1		Systematic	47.9436	-122.4939
2013-08-30 12:28:16	Harbor Porpoise	Rest/Slow Travel	1		Transit	47.7844	-122.7061
2013-08-30 14:36:00	Harbor Porpoise	Rest/Slow Travel	3		Systematic	47.6784	-122.8539
2013-08-30 14:49:34	Harbor Porpoise	Rest/Slow Travel	1		Systematic	47.6125	-122.9443
2013-08-30 16:13:07	Harbor Porpoise	Rest/Slow Travel	1		Systematic	47.2134	-122.6099
2013-08-30 16:16:09	Harbor Porpoise	Medium Travel	3	1	Systematic	47.2433	-122.5942
2013-08-30 16:24:25	Harbor Porpoise	Medium Travel	1		Systematic	47.2433	-122.6530
2013-08-30 16:34:52	Harbor Porpoise	Medium Travel	2	1	Systematic	47.2793	-122.6967
2013-08-30 16:35:57	Harbor Porpoise	Mill	3		Circling	47.2645	-122.7023
2013-08-31 9:35:12	Harbor Porpoise		5	1	Systematic	47.2407	-122.6654
2013-08-31 16:20:51	Harbor Porpoise		10		Systematic	48.1467	-122.7366
2013-08-31 16:21:09	Harbor Porpoise	Fast Travel	4		Circling	47.3267	-122.2259
2013-08-31 16:32:02	Harbor Porpoise	Fast Travel	1		Systematic	48.1447	-122.6608
2013-08-31 16:32:10	Harbor Porpoise	Fast Travel	3		Systematic	48.1438	-122.6556
2013-08-31 17:00:01	Harbor Porpoise	Rest/Slow Travel	2		Transit	47.4953	-122.4264
2013-09-01 8:57:03	Harbor Porpoise	Medium Travel	6	1	Systematic	48.1750	-122.7210
2013-09-01 9:07:57	Harbor Porpoise	Medium Travel	1		Transit	48.1869	-122.7550
2013-09-01 9:08:10	Harbor Porpoise	Mill	1		Transit	48.1899	-122.7470
2013-09-01 9:08:44	Harbor Porpoise		1		Transit	48.1931	-122.7215

Date and Time	Species	Initial Sighting Behavior State	Best Count	No. of Calves	Leg Type	Latitude (°North)	Longitude (°West)
2013-09-01 9:23:33	Harbor Porpoise		5		Systematic	48.2385	-122.6052
2013-09-01 10:03:02	Harbor Porpoise	Medium Travel	1		Transit	48.2557	-122.5423
2013-09-01 10:09:10	Harbor Porpoise	Mill	8		Transit	48.0995	-122.6698
2013-09-01 10:09:15	Harbor Porpoise		1		Transit		
2013-09-01 10:18:32	Harbor Porpoise	Rest/Slow Travel	1		Transit	48.0539	-122.6667
2013-09-01 10:36:01	Harbor Porpoise	Rest/Slow Travel	1		Systematic	47.7072	-122.8865
2013-09-01 14:00:42	Harbor Porpoise	Medium Travel	3		Systematic	47.1423	-122.6586
2013-09-01 15:03:00	Harbor Porpoise	Mill	3		Systematic	47.3077	-122.7321
2013-09-01 16:37:10	Harbor Porpoise	Medium Travel	2	1	Systematic	47.6119	-122.4313
2013-09-02 9:19:56	Harbor Porpoise	Medium Travel	1		Systematic	47.8766	-122.4138
2013-09-02 9:26:05	Harbor Porpoise		1		Circling	47.8928	-122.4221
2013-09-02 9:35:18	Harbor Porpoise	Medium Travel	2		Systematic	47.9096	-122.4892
2013-09-02 9:35:30	Harbor Porpoise	Medium Travel	1		Systematic	47.9080	-122.4960
2013-09-02 9:39:40	Harbor Porpoise		1		Circling	47.9133	-122.4956
2013-09-02 9:49:25	Harbor Porpoise	Medium Travel	1		Systematic	47.9450	-122.5706
2013-09-02 9:49:17	Harbor Porpoise	Medium Travel	2	1	Systematic	47.9459	-122.5776
2013-09-02 9:51:37	Harbor Porpoise	Mill	5	1	Circling	47.9450	-122.5635
2013-09-02 9:49:26	Harbor Porpoise		3		Systematic		
2013-09-02 9:57:43	Harbor Porpoise	Rest/Slow Travel	1		Systematic	47.9394	-122.5360
2013-09-02 9:59:22	Harbor Porpoise	Mill	1		Systematic	47.9446	-122.4652
2013-09-02 10:12:46	Harbor Porpoise	Mill	2		Systematic	47.9777	-122.5890
2013-09-02 10:13:58	Harbor Porpoise		1		Circling	47.9657	-122.5862
2013-09-02 12:59:28	Harbor Porpoise		3		Systematic	48.1477	-122.7000
2013-09-02 12:59:35	Harbor Porpoise	Medium Travel	1		Systematic	48.1446	-122.6947
2013-09-02 12:59:39	Harbor Porpoise	Medium Travel	2		Systematic	48.1475	-122.6916
2013-09-02 13:26:39	Harbor Porpoise	Medium Travel	2	1	Systematic	48.1777	-122.7470
2013-09-03 15:43:42	Harbor Porpoise	Medium Travel	4		Systematic	47.2785	-122.6892

Date and Time	Species	Initial Sighting Behavior State	Best Count	No. of Calves	Leg Type	Latitude (°North)	Longitude (°West)
2013-09-03 17:34:45	Harbor Porpoise	Medium Travel	2		Systematic	47.6138	-122.4236
2013-09-03 17:48:02	Harbor Porpoise	Medium Travel	2		Systematic	47.6794	-122.4517
2013-09-03 17:53:37	Harbor Porpoise	Medium Travel	2	1	Systematic	47.7137	-122.4560
2013-09-03 18:03:35	Harbor Porpoise	Medium Travel	1		Systematic	47.7425	-122.3814
2013-09-03 18:20:01	Harbor Porpoise	Medium Travel	1		Systematic	47.8115	-122.4638
2013-09-03 18:20:28	Harbor Porpoise		2		Circling	47.8023	-122.4541
2013-09-03 18:21:51	Harbor Porpoise	Medium Travel	1		Systematic	47.8059	-122.4381
2013-09-03 18:22:01	Harbor Porpoise		2		Systematic	47.8100	-122.4311
2013-09-03 18:22:05	Harbor Porpoise		2		Systematic	47.8055	-122.4289
2013-09-03 18:22:25	Harbor Porpoise	Medium Travel	1		Systematic	47.8093	-122.4150
2013-09-03 18:25:02	Harbor Porpoise	Medium Travel	2		Transit	47.7527	-122.4289
2013-09-03 18:26:07	Harbor Porpoise	Medium Travel	1		Transit	47.7189	-122.4480
2013-09-04 8:53:23	Harbor Porpoise	Rest/Slow Travel	2	1	Transit	47.6433	-122.4590
2013-09-04 8:54:56	Harbor Porpoise		1		Transit	47.6846	-122.4464
2013-09-04 10:02:35	Harbor Porpoise		1		Transit	47.3011	-122.4717

Table 10. Summary of Risso's Dolphin Sightings during Puget Sound Marine Mammal Aerial Surveys 30 August– 4 September 2013.

Date 2013	Initial Sighting Time	Species	Photo Numbers	Photo Times	Location	Latitude (°North)	Longitude (°West)	Number of Animals	Initial Dispersal (BL) [#]	Initial Heading	Behavior	Time Observed (Circling)
8/31	11:19	Risso's Dolphin	no photos	N/A [#]	2.7 km from Blake Island; 3.4 km from West Seattle	47.5449	-122.4449	2	0.5	N/A	Medium Travel	11 min ⁺
9/4	8:56	Risso's Dolphin	9794-9826	9:00-9:01	3.6 km from Shoreline	47.7331	-122.4226	2	0.5	273 (west)	Medium Travel	5.5 min

[#]BL = Body lengths, ⁺ min = minutes

*N/A = not applicable; these animals were only seen once briefly as they swam just below the water surface. They were not resighted during subsequent circling.

Table 11. Number of Pinniped Groups Sighted in Water Versus Hauled Out during Puget Sound Marine Mammal Aerial Surveys 30 August–4 September 2013.

Species	Total Number of Groups	No. Groups Seen In Water	Percent of Sightings in Water	No. Groups Hauled-Out	Percent of Sightings Hauled-Out
Harbor Seal	675	648	96	27	4
California Sea Lion	15	11	73	4	27
Unidentified Pinniped	4	3	75	1	25
Total	694	662/694		32/694	

Table 12. Number of Harbor Seal Sightings by Survey Subregion during Puget Sound Marine Mammal Aerial Surveys 30 August–4 September 2013.

Survey Area	Number of Sightings	Percent of Total Sightings
Southern Puget Sound	260	39
Hood Canal	121	18
East Whidbey	100	15
Vashon	79	12
Admiralty Inlet	45	7
South Whidbey	29	4
Seattle	27	4
Bainbridge	14	1
Total	675	100

Table 13. Summary of Other Marine Species Seen in the Water (excluding birds) during Puget Sound Marine Mammal Aerial Surveys 30 August–4 September 2013.

Species	Number of Sightings	Estimated Number of Individuals Sighted	Estimated Average Sighting Size
Fish School	21	N/A	N/A
Shark	1	1	1

Table 14. Frequency of occurrence and percentage of behavior states of marine mammal groups during Puget Sound Marine Mammal Aerial Surveys 30 August–4 September 2013.

Species	Frequency of Occurrence (Group Count)						Percent Occurrence					
	Slow travel / Rest	Medium -Fast travel	Mill	Hauled -Out	Dive	Total No. Grps	Slow Travel / Rest	Medium -Fast travel	Mill	Hauled-Out	Dive	Total Percent
Harbor Seal	423	91	42	27	21	604	70	15	7	4	3	100
Harbor Porpoise	9	33	8		0	50	18	66	16		0	100
California Sea Lion	7	2	2	4	0	15	47	13	13	27	0	100
Unidentified Small Marine Mammal	1	4	1	0	0	6	17	66	17		0	100
Unidentified Marine Mammal	1	1	0	0	0	2	50	50	0	0	0	100
Unidentified Pinniped	0	2	1	1	0	4	0	50	25	25	0	100
Risso's Dolphin	0	1	0		0	1	0	100	0		0	100
Unidentified Porpoise	0	2	0		1	3	0	67	33		0	100
Unidentified Medium Marine Mammal	0	0	0	0	0	0	0	0	0	0	0	0

Table 15. Summary statistics for maximum dispersal distance between individuals (in estimated adult body lengths [BL]) within groups* for two species of marine mammals sighted during Puget Sound Marine Mammal Aerial Surveys 30 August–4 September 2013.

Species	No. Groups	Minimum	Median	Maximum	Mean	Std Dev	Std Error
Harbor Seal**	41	0.5	2	50	6.4	9.52	1.44
Harbor Porpoise	29	0.5	2	50	4.1	9.38	1.72

*Group = A group was defined as a set of individuals that interacted socially and/or showed coordinated activity in their behavior (Whitehead 2003; Visser 2011). For harbor porpoises in this study, a group was defined as one or more individual animals behaving similarly and/or in a coordinated manner within an estimated 500 m of each other. The latter definition was determined based on the common occurrence of aggregations of harbor porpoise occurring within this distance of one another and to satisfy the assumptions of line transect theory.

**In-water sightings only.