REPORT FOR THE GULF OF ALASKA LINE-TRANSECT SURVEY (GOALS) II: MARINE MAMMAL OCCURRENCE IN THE TEMPORARY MARITIME ACTIVITIES AREA (TMAA)

FINAL REPORT

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ABSTRACT

The U.S. Navy periodically uses a Temporary Maritime Activities Area (TMAA) in the central Gulf of Alaska (GoA), east of Kodiak Island. Current scientific data on affected biological and environmental resources are necessary to conduct analyses required for Navy training, exercise, and technology-acquisition activities. In 2009, the Navy funded a vessel-based line-transect survey that provided density estimates for fin (*Balaenoptera physalus*) and humpback (*Megaptera novaeangliae*) whales in the TMAA. However, additional data on marine mammal species were necessary to obtain the regionalized population-density data that Navy and other participating Federal agencies like the Bureau of Ocean Energy Management need to meet their environmental stewardship obligations. In the summer of 2013, the Navy funded a second survey to fill in the gaps of knowledge on distribution, movements, and densities of marine mammals within this training area.

During this survey, the visual team surveyed 4,504 kilometers (km) of 'full-effort,' which included 349 km of 'transit-effort.' There was an additional 375 km of 'fog-effort' (transect and transit). Based on total effort, there were 802 sightings (1,998 individuals) of 13 confirmed marine mammal species, with an additional 162 sightings (228 individuals) of unidentified cetaceans and pinnipeds (including those recorded on transit and during off-effort mode).

The acoustic team conducted round-the-clock monitoring with a towed-hydrophone array for 6,304 km of line-transect effort totaling 426 hours of 'standard' monitoring, with an additional 374 km of ~30 hours of 'non-standard' and 'chase' effort. There were 379 acoustic detections and 267 localizations of six confirmed cetacean species. Additionally, 186 sonobuoys were deployed (success rate of 93.5 percent) with seven confirmed cetacean species detected. Two satellite transmitter tags were attached to monitor movements of cetaceans. One was deployed on a blue whale (*B. musculus*), which transmitted for 9 days, and the other was deployed on a Baird's beaked whale (*Berardius bairdii*), which transmitted for 15 days. Based on photo-identification matches, the tagged blue whale had been previously identified off Baja California, Mexico, in 2005. Photographs of five cetacean species were collected for photo-identification purposes: fin, humpback, blue, killer (*Orcinus orca*) and Baird's beaked whales.

Density and abundance estimates (uncorrected for proportion of animals missed on the transect line) were estimated from line-transect data for six cetacean and one pinniped species. The abundance of large whales not identified to species was computed and allocated to blue, fin, and humpback whales proportionally within each stratum. Pooled density (D) and abundance (N) estimates for the survey area were: blue whales (N = 78; D = 0.0005; CV = 1.22), fin whales (N = 3,581; D = 0.0217; CV = 0.28), humpback whales (N = 3,054; D = 0.0185; CV = 0.71), killer whales (N = 950; D = 0.0058; CV = 0.73), sperm whales (*Physeter macrocephalus*; N = 296; D = 0.0018; CV(N) = 0.57), Dall's porpoise (*Phocoenoides dalli*; N = 11,924; D = 0.0722; CV = 0.28), and northern fur seals (*Callorhinus ursinus*; N = 1,770; D = 0.0107; CV = 0.23). A second density and abundance estimate was obtained for sperm whales using acoustic localizations from the towed-hydrophone array (N = 215; D = 0.0013; CV = 0.18).

The estimates of abundance and density for five species were obtained for the first time for this region. New information on movements and habitat use were documented using data collected from the first satellite tag deployments on either blue or Baird's beaked whales within this region. Photographic data contributed to knowledge on seasonal presence of individuals. Overall, this survey provides one of the most comprehensive datasets on marine mammal occurrence, abundance, and distribution within the central GoA, an area rarely surveyed.

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ACRONYMS AND ABBREVIATIONS

AKDT	Alaska Daylight Time
BOEM	Bureau of Ocean Energy Management
CDS	Conventional Distance Sampling
CV	coefficient of variation
dB	decibel(s)
DiFAR	Directional Frequency Analysis and Recording
ESA	Endangered Species Act
GoA	Gulf of Alaska
GOALS	Gulf of Alaska Line-transect Survey
hr	hour(s)
Hz	hertz
kHz	kilohertz
km	kilometer(s)
km^2	square kilometer(s)
m	meter(s)
MCDS	Multiple Covariate Distance Sampling
mm	millimeter(s)
NMML	National Marine Mammal Laboratory
PAM	Passive acoustic monitoring
SPW	Sparton
TMAA	Temporary Maritime Activities Area
USSI	UnderSea Sensor Systems, Inc.

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INTRODUCTION

The Gulf of Alaska (GoA) is a highly productive ecosystem home to a diverse number of marine mammal species ranging from the largest of great whales, the blue whale (*Balaenoptera musculus*), to the smallest marine mammal, the sea otter (*Enhydra lutris*). Although some species are present year-round, the greatest numbers occur between the spring and fall, as the GoA is an important feeding destination for migratory species (Allen and Angliss 2013). Aggressive hunting from land and sea occurred until the passage of the Marine Mammal Protection Act of 1972 and the Endangered Species Act (ESA) of 1973 (Scheffer 1972; Rice and Wolman 1982; Ivashchenko et al. 2013), resulting in population declines of varying severity. Large-scale commercial hunting severely depleted large whale populations including blue, fin (*B. physalus*), humpback (*Megaptera novaeangliae*), sperm (*Physeter macrocephalus*), sei (*B. borealis*), gray (*Eschrichtius robustus*), and North Pacific right whales (*Eubalaena japonica*). While some species have recovered, such as the gray whale (Rugh et al. 2005) that was delisted from the ESA in 1994 (NMFS 1994), others remain at critically low levels. The North Pacific right whale was devastated by illegal Soviet whaling in the 1960s (Ivashchenko and Clapham 2012) and has been rarely sighted in the GoA in recent years (Wade et al. 2011).

Research in the GoA, particularly in offshore areas, presents numerous challenges due to its remote location and inclement weather. There are contemporary abundance and distribution data for nearshore species of pinnipeds and sea otters (Allen and Angliss 2013; USFWS 2013a,b,c) and for some cetaceans (Brueggeman et al. 1987, 1988; Forney and Brownell 1996; Zerbini et al. 2006, 2007) from surveys conducted after the 1980s. In contrast, the bulk of the knowledge on cetacean distribution in offshore areas throughout the GoA is mainly derived from commercial catch records (Townsend 1935; Nishiwaki 1966) and scouting vessel data (Berzin and Rovnin 1966; Wada 1979). Species of large whales, including humpback, fin, and right whales, feed in the outer continental shelf and slope waters from spring into fall. Ranges encompass offshore waters in the GoA along with blue, sei, and sperm whales (Berzin and Rovnin 1966; Rice 1974; Ivashchenko and Clapham 2012). Bottom-mounted hydrophones in the offshore GoA have recorded calls from blue, humpback, fin (Mellinger et al. 2004b; Stafford et al. 2007), and sperm whales (Mellinger et al. 2004a) throughout the year. In recent years, a few limited surveys within restricted areas of this region have provided information on cetacean distribution and abundance (Rone et al. 2010; Barlow et al. 2011; Matsuoka et al. 2012, 2013). The GoA is also home to three known species of beaked whales, Baird's (*Berardius bairdii*), Cuvier's (*Ziphius cavirostris*), and Stejneger's (*Mesoplodon stejnegeri*). Beaked whales are some of the most poorly understood of cetaceans with only limited sightings within the GoA (Allen and Angliss 2013). They spend a majority of their time submerged (Tyack et al. 2006; Arranz et al. 2011), regularly dive to depths of hundreds to thousands of meters, often occur in small groups, and behave inconspicuously at the surface. These factors make them extremely difficult to detect and study using visual survey methods alone. Recent advancements in passive acoustic detection and survey techniques have made passive acoustic monitoring (PAM) a viable method for detecting and surveying these elusive animals (Yack 2013). The Navy has funded year-round PAM within the GoA TMAA since July 2011 using bottom-mounted hydrophones at two sites in 2011 and three sites in 2012. Four baleen whale species (blue, fin, gray and humpback whales), and at least 7 species of odontocetes (Baird's, Cuvier's, and Stejneger's beaked whales, killer and sperm whales, probable Dall's porpoise and Risso's dolphins (Baumann-Pickering et al. 2012a; 2012b; 2013; Debich et al. 2013).

The U.S. Navy periodically uses a Temporary Maritime Activities Area (TMAA; 144,560 square kilometers [km^2]) in the central GoA, east of Kodiak Island (**Figure 1**). The TMAA encompasses diverse habitat consisting of the continental shelf, slope, and offshore pelagic waters with numerous seamounts in the offshore region (**Figure 1**). In order for the Navy to conduct training, exercise, and technology acquisition, analyses on the potential impacts on biological and environmental resources are required. In 2009, the Navy funded a line-transect survey that provided density and abundance estimates for fin and humpback whales as well as limited distribution information for several other species (Rone et al. 2010). That survey was successful in gathering important data on the marine mammal species present in this largely unexplored area. However, additional data on regionalized species' densities was needed for the Navy and other participating Federal agencies like the Bureau of Ocean Energy Management (BOEM) to meet their environmental stewardship obligations. In the summer of 2013, the Navy funded an additional survey to fill knowledge gaps on distribution, movements and densities of marine mammals within the TMAA.

Line-transect survey and analytical methods are relatively well developed for estimating abundance of marine mammals using visual sighting data (Holt 1987; Kinzey et al. 2000; Buckland et al. 2001). Line-transect methods require accurate measurements of the perpendicular distances of animals from the survey trackline. These distances are then used to estimate a detection function (Buckland et al. 2001). A similar analytical approach can be applied to acoustic data for estimating sperm whale abundance (Leaper et al. 1992; Leaper et al. 2000; Barlow and Taylor 2005; Swift et al. 2009). Given the success of PAM during the 2009 survey and the advancements made in PAM technology and knowledge since that time, PAM was integrated into the survey plan.

The overall goal for the 2013 Gulf of Alaska Line-transect Survey (GOALS II) project was to acquire data to assess the abundance, density, and spatial distribution of marine mammals through visual line-transect surveys and PAM using a towed-hydrophone array and sonobuoys. Additional opportunistic objectives were to: (1) photo-identify whales for analysis of habitat use during summer months, (2) increase knowledge of the vocal repertoire of cetaceans by linking visual sightings to sounds recorded from vocally active whales, and (3) deploy satellite transmitters on cetaceans to provide information on movements and habitat use within the GoA.

METHODS

Survey Design

The GOALS II survey was conducted from 23 June to 18 July 2013 aboard the *R/V Aquila*, a 50-meter (m) charter crab-fishing boat. Four survey areas were established to stratify effort across four distinct habitats within the GoA TMAA: continental shelf or 'inshore' stratum, 'slope' stratum, pelagic or 'offshore' stratum, and 'seamount' stratum (**Figure 1, Table 1**). Tracklines were designed to provide uniform sampling coverage within each stratum using an equal-spaced zigzag sampler (Strindberg et al. 2004). The effort per unit of area allocated to the inshore, slope, and seamount strata was twice that allocated to the offshore stratum (**Table 1; Appendix A**).

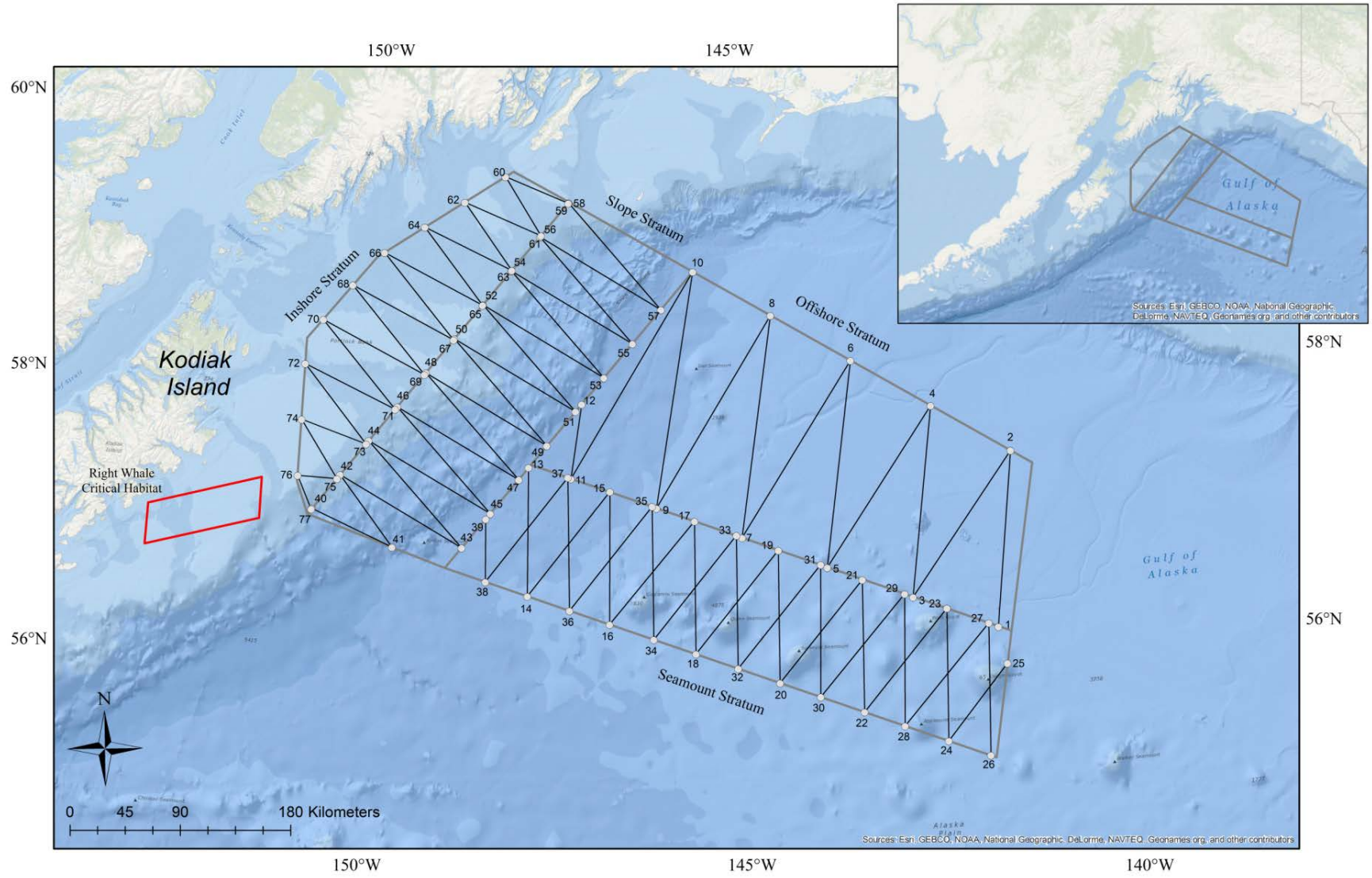


Figure 1. Survey strata and tracklines for the GOALS II research cruise.

Table 1. Strata and proposed effort allocation for the GOALS II research cruise.

Stratum	Area (km^2)	No. of Tracklines	Proposed Effort	
			(km)	(km/1,000 km^2)
Inshore	22,749	18	1,296	56.97
Offshore	60,051	11	1,752	29.18
Seamount	45,377	25	2,610	57.52
Slope	36,776	18	1,986	54.00
Total	**164,953**	**72**	**7,644**	**—**

Visual Survey

Observation methods were similar to those used in Rone et al. (2010). Rotating teams of three scientists collected sighting data using standard line-transect methods during on-effort mode. Operations began at 0600 Alaska Daylight Time (AKDT) and ceased at 2300 (AKDT), or as long as conditions would allow. A full observation period lasted 1.5 hours (30 minutes in each position) and was followed by a 2-hour rest period. All three scientists (starboard and port observers and data recorder) were stationed on the same level (platform + observer height = 6.9 m). Starboard and port observers were located on the bridge wings and the data recorder was inside the bridge. Observers used 25× 'big-eye' binoculars with reticles to scan from 10 degrees past the bow on the opposite side to 90 degrees abeam. The data recorder surveyed the trackline with 7 × 50 binoculars while scanning through the viewing areas of the two primary observers. When a sighting was made, the primary observer conveyed to the recorder the horizontal angle and number of reticles from the horizon to the initial sighting. Additional information collected was sighting cue; course and speed; species identity; and best, high, and low estimates of group size. The computer program *Mysticetus* (available at www.mysticetus.com) was used to record all sighting and environmental data (sea state, swell height, glare, precipitation, and visibility).

'Full-effort' was defined as a visible horizon, Beaufort sea state ≤ 5, and survey speed of 8 knots through the water. 'Fog-effort' was defined as observations conducted under poor visibility (no horizon visible due to fog or weather) with a Beaufort sea state ≤ 5. During poor weather conditions (visibility ≤ 1 km and/or Beaufort sea state ≥ 6), off-effort watches on the bridge were conducted with a single data recorder/observer primarily to monitor for improvements in conditions. 'Transit-effort' was conducted in either 'full-' or 'fog-effort' on connector lines between transects. At the cruise leader's discretion, line-transect survey effort was temporarily suspended to approach sightings for photo-identification and satellite tagging operations. Given the vast survey area and use of PAM, the ship continued along the transect lines 24 hours (hr)/day and visual operations were conducted when possible.

Ship-based Passive Acoustics – Towed-Hydrophone Array

Real-time monitoring and recording effort was conducted using a towed-hydrophone array and sonobuoys around-the-clock to detect and localize vocally active cetaceans. Personnel consisted of four bioacousticians with two on watch at any given time, maintaining a 12-hr shift rotation split between towed-array and sonobuoy monitoring effort. During daylight, PAM was conducted simultaneously with the visual survey effort. PAM was used as the primary survey method during unfavorable sighting conditions.

The towed hydrophone array consisted of five hydrophones. These included two high-frequency Reson (R) hydrophones (flat frequency response (+/- 1.5 decibels [dB]) from 1 to 180 kilohertz [kHz]; 35 dB gain) and three mid-frequency hydrophones (APC International, Inc.; flat frequency response [+/- 1.5 dB] from 1 to 100 kHz; 36 dB gain) arranged as shown in **Figure 2**. Two signal processing and recording systems were used during the survey. The first consisted of a mid-frequency system (**Figure 3**) used in the offshore, seamount, and slope strata and the second, a mid- and high-frequency system used in the inshore stratum (**Figure 4**). Each system was designed to target species of interest in each habitat. The mid-frequency system targeted sperm, killer, and beaked whales, and the high-frequency system was used to detect porpoise.

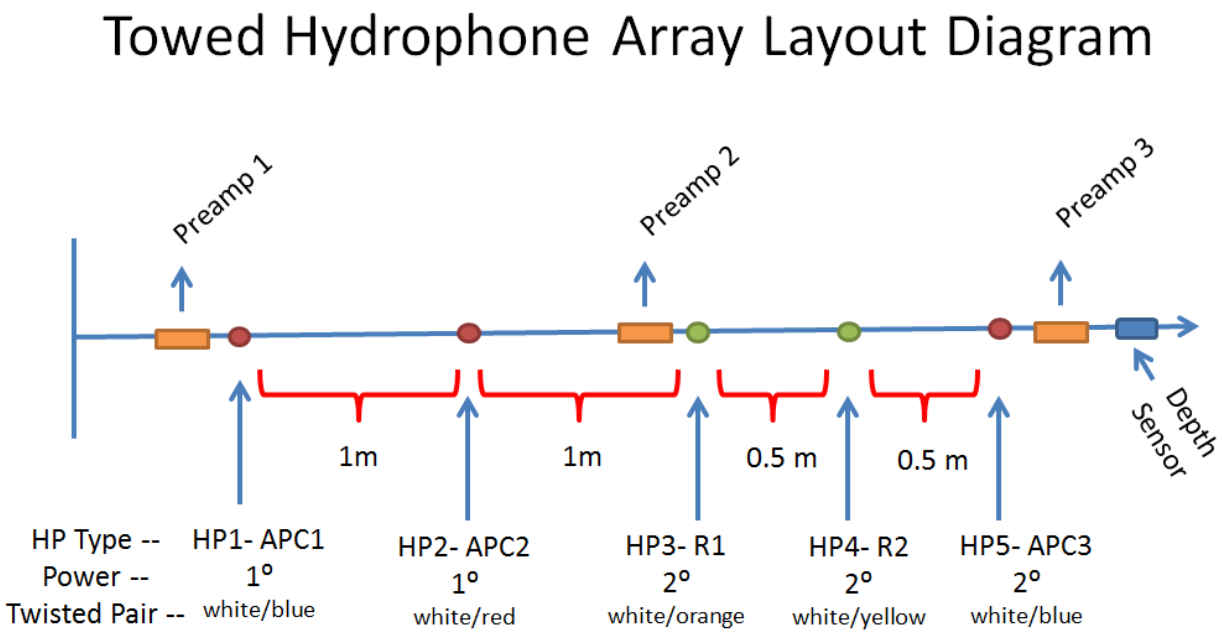


Figure 2. Diagram for the Bio-Waves hydrophone array.
The array includes two high-frequency Reson hydrophones (R1 and R2), three mid-frequency hydrophones (APC1, APC2 and APC3), and a pressure sensor (Depth Sensor in diagram). Hydrophone spacing is indicated in the diagram along the bottom of the array. Hydrophone (HP) type, power assignment (primary [1 degree]) or secondary [2 degrees]) and twisted pair assignments are denoted below the figure.

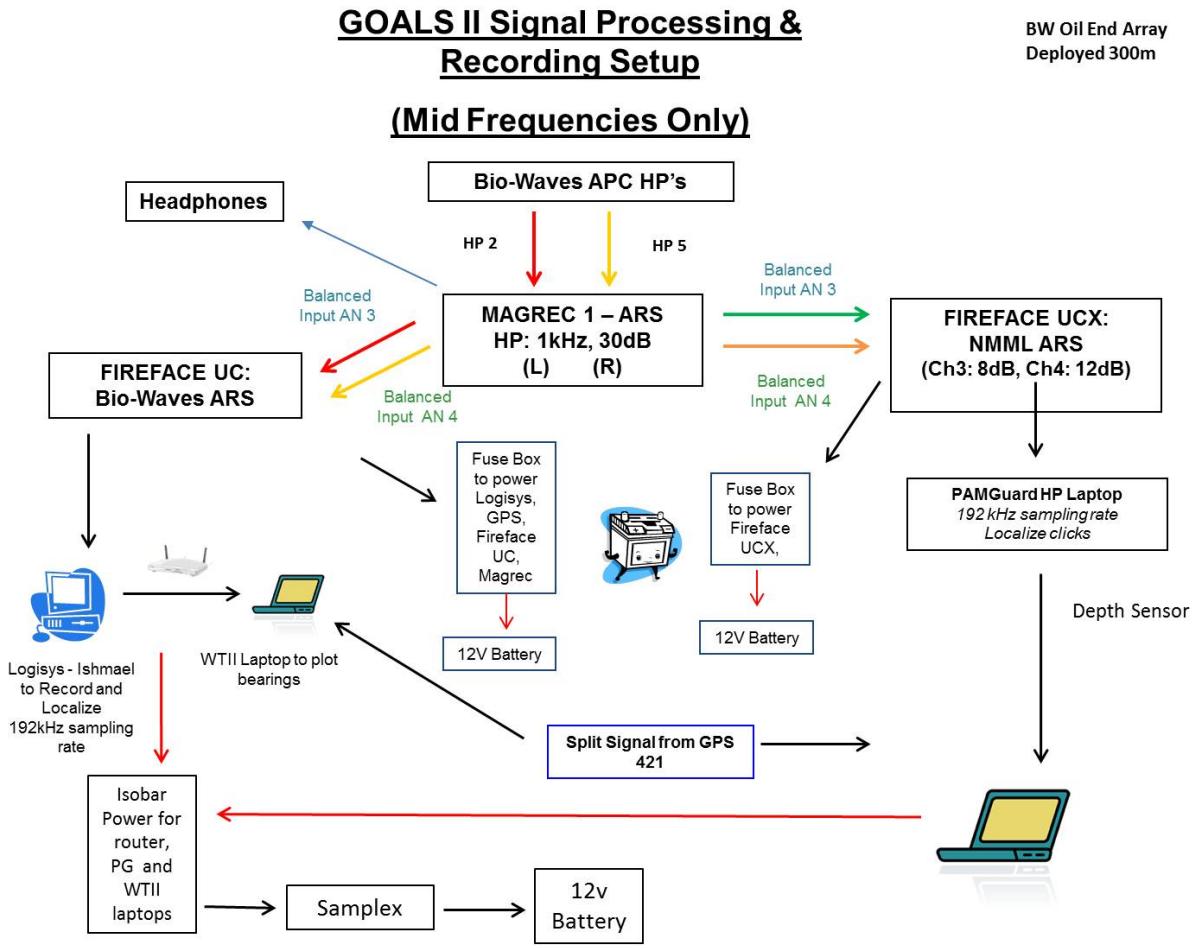


Figure 3. Acoustic signal processing and recording system.
Mid-frequency hydrophone signals were used for both manual (Ishmael/WhalTrak II) and semi-automated (PAMGuard) processing methods. Hydrophones 2 (APC2) and 5 (APC3) were used exclusively for localization and recording in Ishmael, as well as for click localization and recording/data collection using PAMGuard. Although the same mid-frequency signal is used for both systems, they are both powered by separate battery banks.

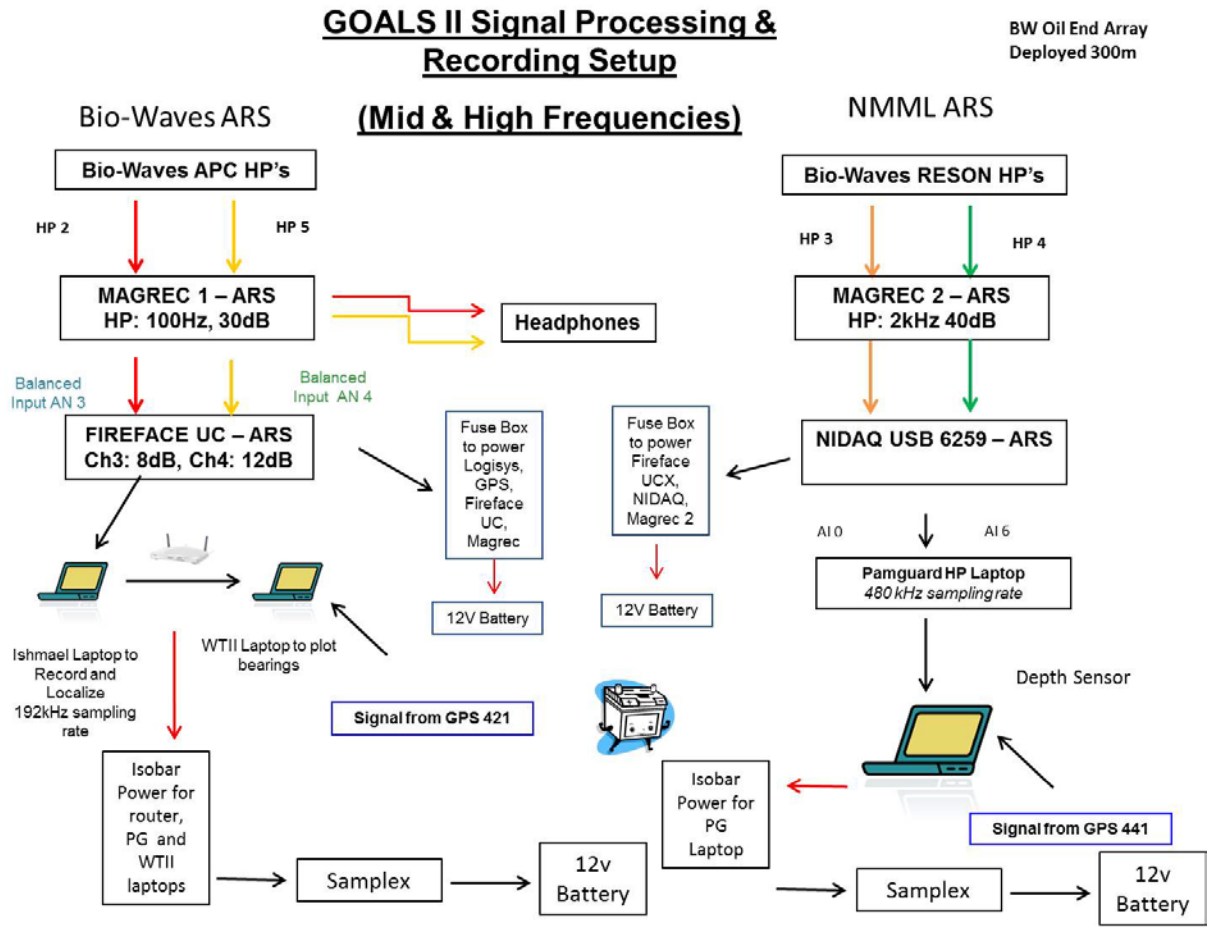


Figure 4. Acoustic signal processing and recording system.
This system received mid-frequency signals from APC hydrophones and high-frequency signals Reson hydrophones. Hydrophones 2 (APC2) and 5 (APC3) signals are received using the Bio-Waves Acoustic Recording System (ARS) and processed for localization and recording using Ishmael/Whaltrak II software. High-frequency hydrophones 3 (R1) and 4 (R2) were processed using a second (NMML) ARS, for click localization and recording/data collection using PAMGuard. Each ARS system is powered using independent fuse box and battery banks.

Signal processing, localization, recording, and documentation were achieved through a combination of programs including *Ishmael* (Mellinger 2001), *WhalTrak II* (created by Glen Gailey at Texas A&M University), and *PAMGuard* (www.pamguard.org). *Ishmael* was used to record acoustic data and obtain bearings to user-selected vocalizations for localization via target motion analysis (Mellinger 2001). Two-channel recordings were made in .wav formats sampled at 192 kHz. Recordings were made continuously with files saved at 10-minute intervals. All acoustic data were backed up periodically (at least once per 24-hr period) to internal and external hard drives. *WhalTrak II* was used for manually localizing and plotting whistling cetaceans and compact groups. It also recorded the ship's position, heading, and speed; estimated position of the array; and form data, using an *MS Access* database. *PAMGuard* was used as an automated click and whistle detector. It was configured using an automatic click classification module for sperm whales, killer whales (*Orcinus orca*), Cuvier's beaked whale, Baird's beaked whale, Stejneger's beaked whale, and porpoise (phocoenid spp.). Echolocation clicks were localized

using semi-automated methods based on target motion analysis. Data from the two high-frequency (Reson) hydrophones or the three mid-frequency (APC) hydrophones were sampled and recorded at 480 kHz and 192 kHz, respectively. All encounters were saved to a *Microsoft Access* database using *PAMGuard*. The following information was recorded: status, initial date/start time, end date/time, acoustic ID, visual ID (if applicable), initial latitude and longitude, first angle, first distance, perpendicular distance, beam time, detection distance, vocal type, detection type (acoustic, visual, both), first detection (acoustic, visual, both), species ID, trackline number, and localization quality. Acoustic effort was recorded using the PAMGuard Logger Forms module. Acoustic effort was denoted as 'standard' when monitoring during line-transects, 'non-standard' when monitoring but not on line-transect, or as 'chase' when monitoring during events when the visual team went off-effort to locate and identify animals.

Independent acoustic encounters (i.e., any encounter considered to be separate from the previous or next encounter) were assigned an encounter number. Acoustic encounters were determined by the bio-acoustician on watch, using bearings, time-frequency characteristics and patterns of the signals detected. Acoustic encounters were identified to the lowest taxonomic level possible based on descriptions of calls from the literature and acoustician experience. Beaked whale echolocation clicks were distinguished between species based on several characteristics such as duration, spectrum peaks, and Wigner-Ville transform plots (**Figure 5**). A Wigner plot is a quadratic time-frequency representation often used to visually represent the time frequency structure of short duration, broadband cetacean clicks (Papandreou-Suppappola and Antonelli 2001). The Wigner plot is used because it clearly represents frequency modulation such as a frequency upsweep in the click, a distinguishing feature of beaked whale clicks. Information from the waveform (duration: ~0.15–0.5 ms) spectrum (frequency peaks: Baird's = 16–22 kHz, Cuvier's = 38–40 kHz, and Stejneger's = 45–66 kHz) and Wigner plot (verification of upsweep presence) were used to assign mutually exclusive classification identifications to all acoustic encounters of beaked whales (Baumann-Pickering et al. 2013). Stejneger's beaked whale designation was based solely on spatio-temporal patterns of beaked whale echolocation signals as described by Baumann-Pickering et al. (2012a; 2012b; 2013). For unidentified cetaceans, a secondary categorization for probable and possible killer whales and beaked whales was assigned to encounters. A designation of 'probable' was assigned if there was information indicating a species identification but the signal quality was poor (i.e., low signal-to-noise or sporadic/limited occurrence), a designation of 'possible' was assigned if there was only limited information for an identification (i.e., 1–3 vocalizations) and signal quality was also poor.

All acoustic localizations were given quality assessment scores ranging from 1 (best) to 5 (worst). High-quality localizations (score = 1–2) were defined as several (>10) bearings that formed a tight convergence of bearing lines. Low-quality localizations (score = 5) were characterized by only a few (<5) bearings in the localization and/or a relatively loose convergence of bearing lines.

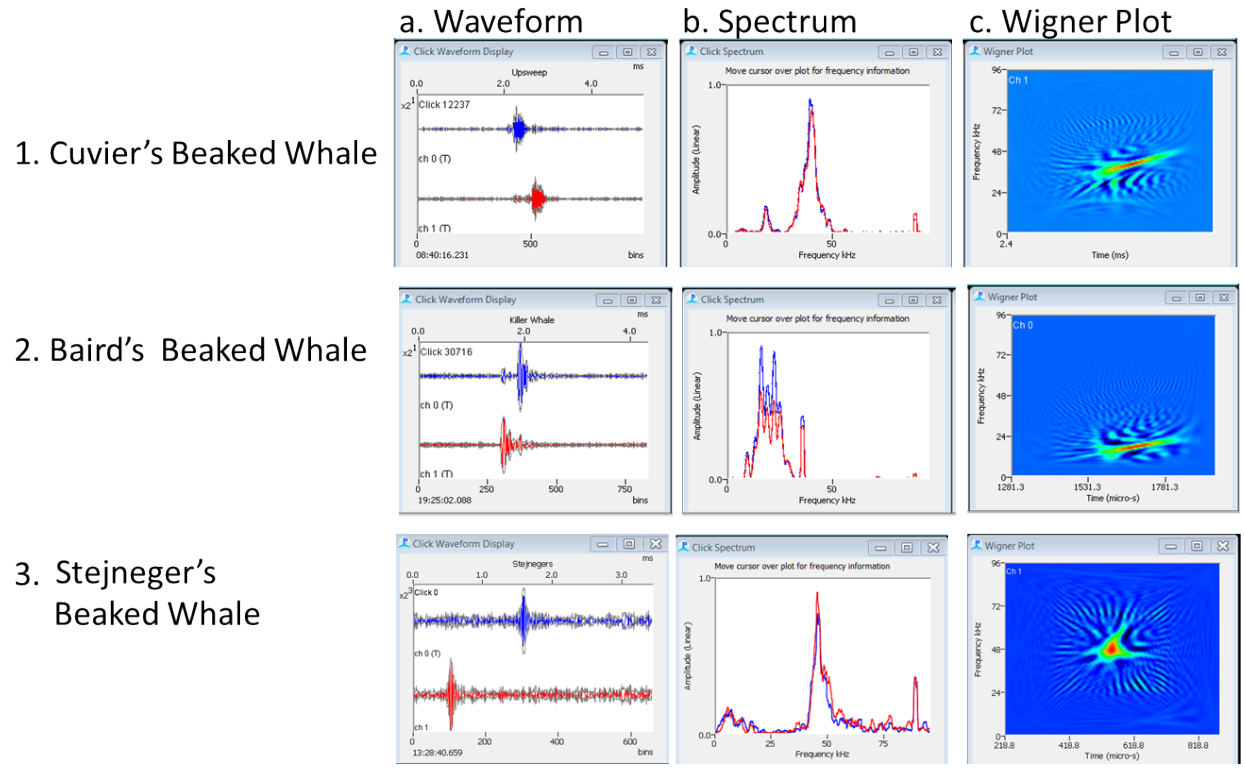


Figure 5. Examples of beaked whale click features.
(a) The waveform, (b) the spectrum and (c) the Wigner plot of typical clicks from (1) Cuvier's, (2) Baird's and (3) Stejneger's beaked whale echolocation clicks.

Ship-Based Passive Acoustics – DiFAR Sonobuoys

Directional Frequency Analysis and Recording (DiFAR) sonobuoys were deployed approximately every 2–3 hours to obtain an evenly sampled census of marine mammal vocalizations (McDonald 2004). Sonobuoys were either operated in DiFAR mode (10 hertz [Hz]–2.5 kHz) when bearings to calls were required (e.g., searching for North Pacific right whales) or omni-directional (10 Hz–22 kHz) to capture a wider spectrum of calls (e.g., on transect). If a sonobuoy failed to transmit, another one was deployed. The primary purpose of sonobuoys was to document the presence of lower-frequency baleen whale calls that cannot be captured by a towed-hydrophone array (e.g., blue, fin, humpback, sei, and North Pacific right whales). AN/SSQ-77C (Sparton [SPW] and UnderSea Sensor Systems, Inc. [USSI]) and AN/SSQ-53F (SPW) were used based solely on availability. Two laptop computers were used for the monitoring system, one to control the three WiNRADiO (model WR-G39WSBe; Oakleigh, Australia) sonobuoy receivers, and one to run the monitoring and tracking software and to control the MOTU soundcard (model UltraLite mk3). A GPS feed into the computer provided the ship's position every minute, as well as the sonobuoy deployment location, information, and time. All data were recorded to an external hard drive. There were two preamplified antennas installed on the vessel, an omni-directional antenna and a Yagi directional antenna. Both antennas (and preamps) were placed in the crow's nest of the vessel, with the directional antenna facing astern (omni-directional = 16 m; Yagi = 14 m above sea level). The Yagi was used primarily during transit when the sonobuoy was guaranteed to be behind the vessel and the omni-directional antenna was used for instances when the sonobuoy was not

directly behind the ship (e.g., after a turn, or when monitoring multiple sonobuoys simultaneously). A switch located on the bridge next to the acoustic station was used to alternate between antennas depending on the vessel's direction of travel. Sonobuoys were monitored in real time day and night throughout the cruise.

Acoustic signals were monitored in real time using the PAM program *Ishmael* (Mellinger 2001). A custom-designed, *MATLAB*-based tracking program (developed by Catherine Berchok, National Marine Mammal Laboratory [NMML]) was used to record the ship's location and plot the location of sonobuoy deployments. If a call was detected, bearing information was obtained using *Ishmael* and the DiFAR demultiplexing software (Greeneridge Sciences, Inc., Santa Barbara, California). The tracking program then plotted the bearing to each call from the sonobuoy(s). Sonobuoy bearing information was calibrated by plotting a bearing to the ship and comparing that with the ship's heading. The corrected angle was then entered into the program to plot the true bearing. Acoustic encounters were identified real-time to the lowest taxonomic level possible based on descriptions of calls from the literature and acoustician experience. Sei whale calls were analyzed in post-processing and were identified by high- and low-frequency down sweeps as described in Rankin and Barlow (2007) and Baumgartner et al. (2008).

Satellite Telemetry

Satellite telemetry operations were conducted opportunistically during periods of favorable weather conditions after one of the target species was located: blue whales, fin whales, and Baird's beaked whales. The satellite tags used were location-only SPOT5 tags (Wildlife Computers, Inc., Redmond, Washington), in the LIMPET (Low Impact Minimally Percutaneous External-electronics Transmitter) configuration (Andrews et al. 2008; Schorr et al. 2009; Baird et al. 2012). Attachment darts penetrated 6.5 centimeters into the dorsal fin or side of the body. Tags were deployed with a Dan Inject pneumatic rifle and were programmed to transmit for variable periods during the day corresponding to the periods with the best satellite overpasses. Observed locations were calculated by the Argos system from Doppler-shift data when multiple messages were received during a satellite's overpass. The Douglas-Moderating Argos filter (available at Alaska.usgs.gov/science/biology/spatial/douglas.html; Douglas et al. 2012) was applied to all Argos-observed locations using *SAS* software (SAS Institute Inc. Version 9.0) in order to remove locations that implied unrealistic deviations from the track. The filter contains a number of user-defined variables including: maximum redundant distance (maxredun), the rate coefficient (Ratecoef), location class (LC), and the maximum sustainable rate of movement (minrate) (Schorr et al 2009; Baird et al. 2012). Both tags (one blue whale, one Baird's beaked whale) were set as follows: maxredun = 3, Ratecoef = 25, and LC = 2. The minrate differed between the two species: 10 kilometers (km)/hr (beaked whale) and 15 km/hr (blue whale).

Photo-Identification

Highest priority species to photograph were blue, right, fin, humpback, sperm, killer and Baird's beaked whales. Photographs were obtained from both the research vessel and a 7-m skiff. Photographs of the dorsal fin as well as saddle patches on killer whales, flukes of humpbacks and sperm whales, and chevrons on fin whales were collected. Photographs were taken using Nikon D-200, Canon 50D, and Canon 7D digital SLR cameras with a 70–300-millimeter (mm) or 100–400-mm zoom telephoto lens. All photographs were reviewed and the highest quality identification photograph(s) of each animal were selected to be compared to existing catalogs from the Pacific and the GoA.

Line-transect Analysis: Visual

Density estimation was computed using only sightings collected during 'full-effort' mode. Line-transect analyses (Buckland et al. 2001; 2004) were conducted to estimate density and abundance of blue, fin, humpback, sperm, killer, and 'unidentified' large whales, as well as Dall's porpoise and Northern fur seals. Detection functions were fit using data collected during the survey for species with sufficient sample sizes (fin and humpback whales, Dall's porpoise, and fur seals). For blue, sperm, and unidentified large whales, perpendicular distances were pooled across all "large whale" species (all Mysticeti except minke whales [*B. acutorostrata*] plus sperm whales). Pooling provided greater sample size for fitting the detection functions, allowing for species-specific densities to be computed, and for improving coefficient of variations (CV) for species with relatively low numbers of detections. Pooling across species with insufficient sample sizes to improve estimation of detection probability is a relatively common practice (e.g. Barlow et al. 1997; Forney and Barlow 1998) as long as pooling includes species with similar detection characteristics. In this study, pooling was based on studies that showed that these species were detected at similar average distances (for example, Barlow et al. 2001). For killer whales, perpendicular distance data collected during this survey were combined with those from a previous killer whale study conducted in the GoA (Zerbini et al. 2007) in order to increase sample size. This approach resulted in 39 additional sightings to estimate killer whale detection probability for GOALS II. Sightings collected in 'full-effort' mode during transit legs to and from the survey strata and between transects were used in the estimation of detection probability but not for density/abundance estimates.

Detection probability was estimated using the hazard-rate or the half-normal models within a Conventional Distance Sampling (CDS) or Multiple Covariate Distance Sampling (MCDS) framework (Buckland et al. 2001; Marques and Buckland 2003). Modeling was conducted with ungrouped data truncated at 5 km for all whale species and Dall's porpoise and at 1.5 km for fur seals. Truncation was set at these distances after exploratory analyses were conducted to assess best truncation points (i.e. balance between sample size and appropriate fit model). The procedures and values selected for truncation are consistent with the literature (e.g. Buckland et al. 2001; Zerbini et al. 2006; Friday et al. 2013). Species was used as a covariate to model perpendicular distance for large whales and group size was used for killer whales. These covariate models tested the assumption that detection distances among the pooled species explained above were in fact similar. Covariate models that did not conform to the detection probability hypothesis being tested were excluded from the analysis. For example, detection probability is expected to increase as group size increases; models that indicated otherwise were removed from the set of candidate models for any given species or group of species before model selection was performed (e.g., Zerbini et al. 2006). Model selection was conducted following the Akaike Information Criterion (AIC, Akaike 1973).

Encounter rate and its variance were estimated empirically from the data (Buckland et al. 2001 for CDS; Innes et al. 2002 for MCDS models). For CDS models, expected group size was estimated by the simple mean within each stratum. For MCDS models, group size was estimated by dividing the estimated density of individuals by the estimated density of groups (Marques and Buckland 2003). The variance of group size estimates was also computed empirically, while the variance of the estimated detection probability was computed from the information matrix from maximum likelihood theory (Buckland et al. 2001; Marques and Buckland 2003). Stratum-specific density and abundance estimates were calculated using the detection probability model that received most support from the data (i.e., the "best" model) according to AIC. Estimates of

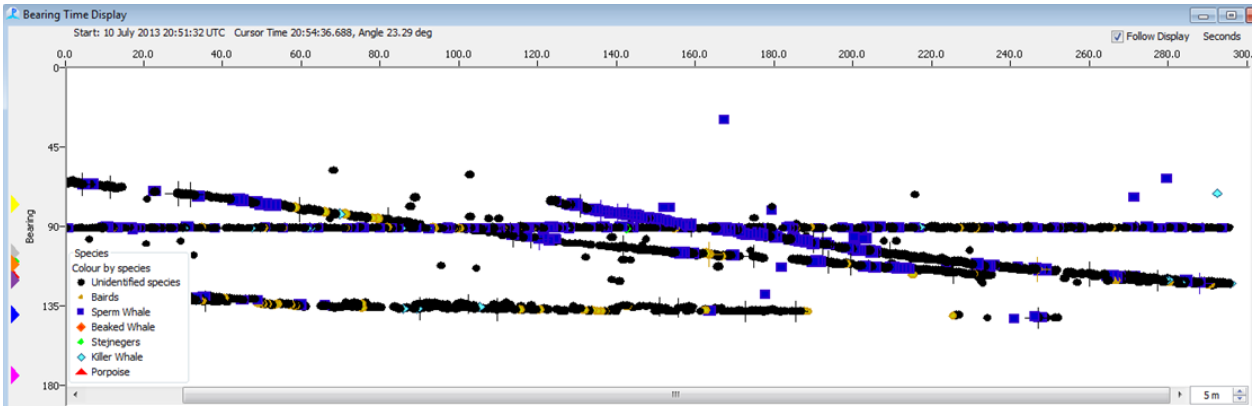
unidentified large whales were proportioned according to the stratum-specific density of blue, fin, and humpback whales and combined with the abundance estimates of each of these three species. Variance of the combined estimates was approximated by the delta method. Log-normal 95 percent confidence intervals were calculated for each estimate as proposed by Buckland et al. (2001). For the purpose of this analysis, detection probability on the trackline was assumed to be (g[0] = 1). Estimates were not corrected for the proportion of animals missed on the trackline (see Discussion – Analysis Caveats for explanation). All parameter estimates were computed using the *R* package *mrds* version 2.1.0 (Laake et al. 2012).

Line-transect Analysis: Towed-Hydrophone Array

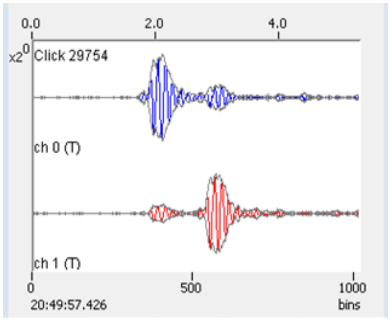
Distance sampling methods using acoustic localizations were employed to estimate density and abundance of sperm whales. Only effort conducted during on-transect periods was used in the analysis. Perpendicular distances from the trackline to the sound source (i.e., single sperm whale) were either estimated in the field or post-processed using *PAMGuard ViewerMode* software. This was accomplished by creating map displays of click detections with bearings plotted along the trackline. Using the bearing/time display (**Figure 6**), click trains were assigned to individual animals in order to create 'events' for each encounter period. Each 'event' represented an individual whale track, and the number of clicks in each event was logged. Bearings to individual clicks were estimated and localizations were calculated using target motion analysis, and a least-squares-fit algorithm was used to estimate the perpendicular distances from the trackline (**Figure 7**). Target motion analysis involves plotting several bearings to a target (i.e., sound source) while steadily moving past it. Using target motion analysis, the bearings should begin to converge at the source location over time. This convergence is used to calculate the perpendicular distance from the trackline to the sound source (i.e., the animal or group of animals). In *PAMGuard* a least-squares-fit algorithm is applied to identify the point of convergence of sequential bearings which is then used to estimate the perpendicular distance from the trackline. The first step of the computation is to fit a straight line to the GPS data and then to project all bearings from that straight line. By using a straight line approximation, it is then possible to use a simple linear regression of the 1/tan(bearing angle) to the animal against their position along the track-line to compute a perpendicular distance and a position along the track-line (Gillespie and Chappell 2002). The regression is carried out for an animal on each side of the trackline. The side with the lowest chi-square is considered the most likely position, where chi-square is the sum of the squares of the difference in measured angles to true angles to the location divided by the expected bearing errors.

Histograms of perpendicular distances were reviewed and scored based on quality of the data (See Methods – Ship-based Passive Acoustics – Towed-Hydrophone Array for scoring) (**Figure 8**); after visual inspection, it was determined that only localizations with quality scores of 1 through 4 would be used for the analysis. The number of localizations with perpendicular distances near the trackline was lower than would be expected based on distance sampling theory (**Figure 9**). This pattern indicates that some assumptions are not being met (e.g., animals are moving away from the vessel before detection, or there is measurement error). To handle this potential bias in the distance data, the data were grouped into larger (equal) intervals prior to analysis to provide estimation robustness and to produce a better fit model as recommended by Buckland et al. (2001).

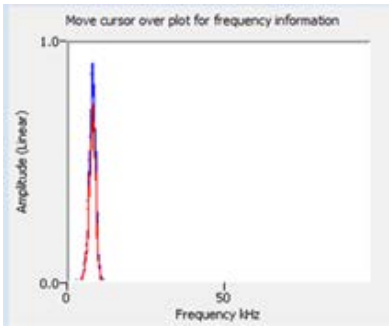
a. Bearing Time Display



b. Waveform Display



c. Spectrum Display



d. Wigner Plot

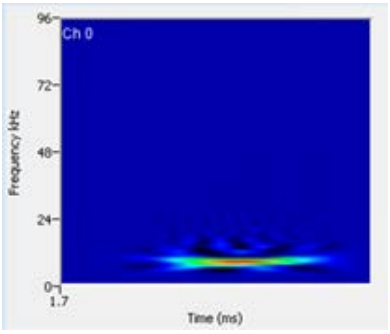


Figure 6. PAMGuard semi-automated click classification and tracking of sperm whales. Panel (a) displays bearing angles from individual animals as they pass the beam (~90°) of the vessel. The x-axis shows time and the y-axis shows the bearing angle. Panel (b) shows a typical waveform of a sperm whale click with amplitude displayed along the y-axis over sample bins displayed on the x-axis. Panel (c) is the spectrum display indicating the peak frequencies of the incoming echolocation signals. Panel (d) shows a Wigner plot of the sperm whale click.

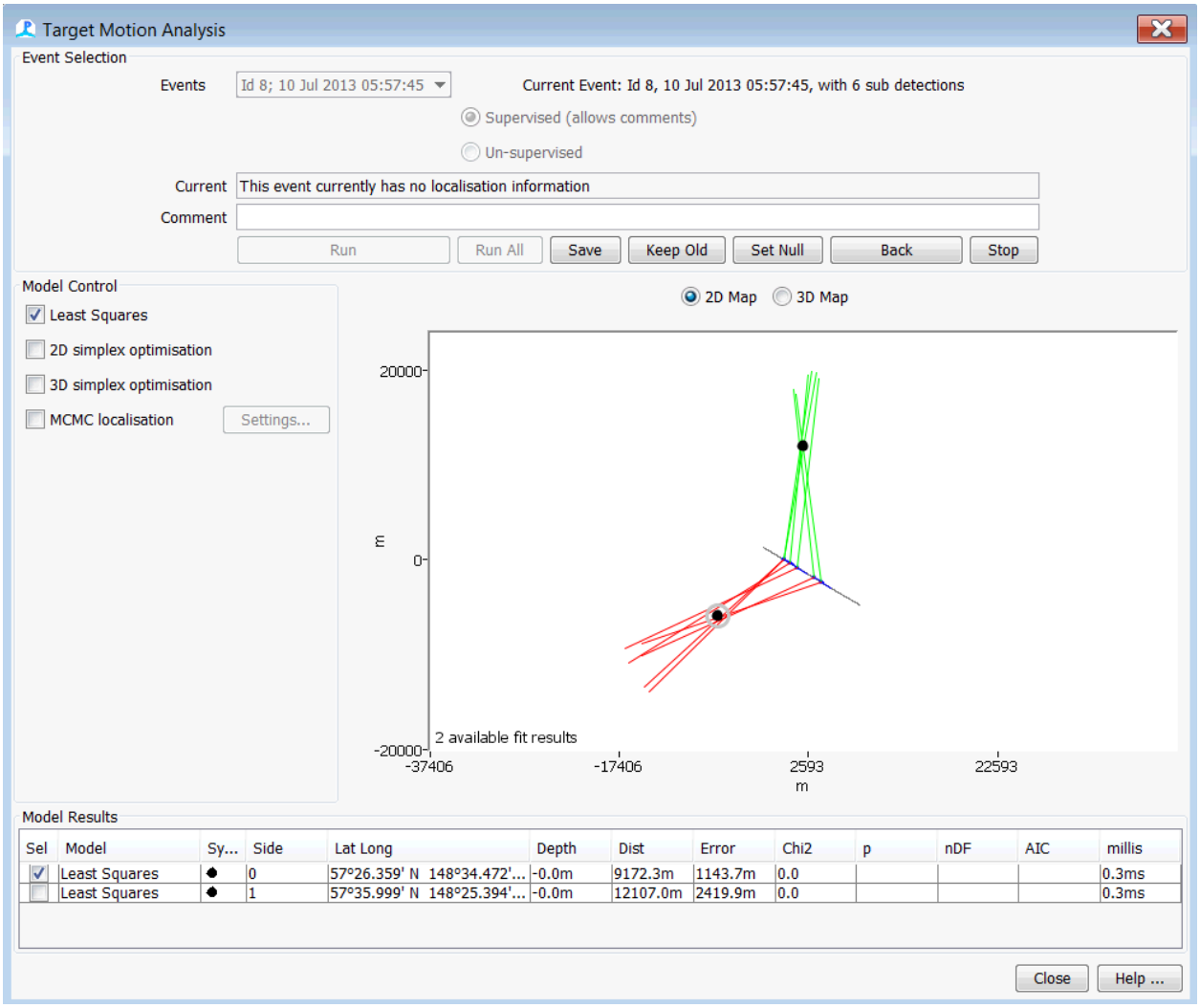


Figure 7. Example of target motion analysis feature of PAMGuard's ViewerMode software. As indicated by the model results panel, a least-squares-fit is used to obtain a port and starboard localization to the sperm whale event and PAMGuard indicates which of these two localizations has the best fit.

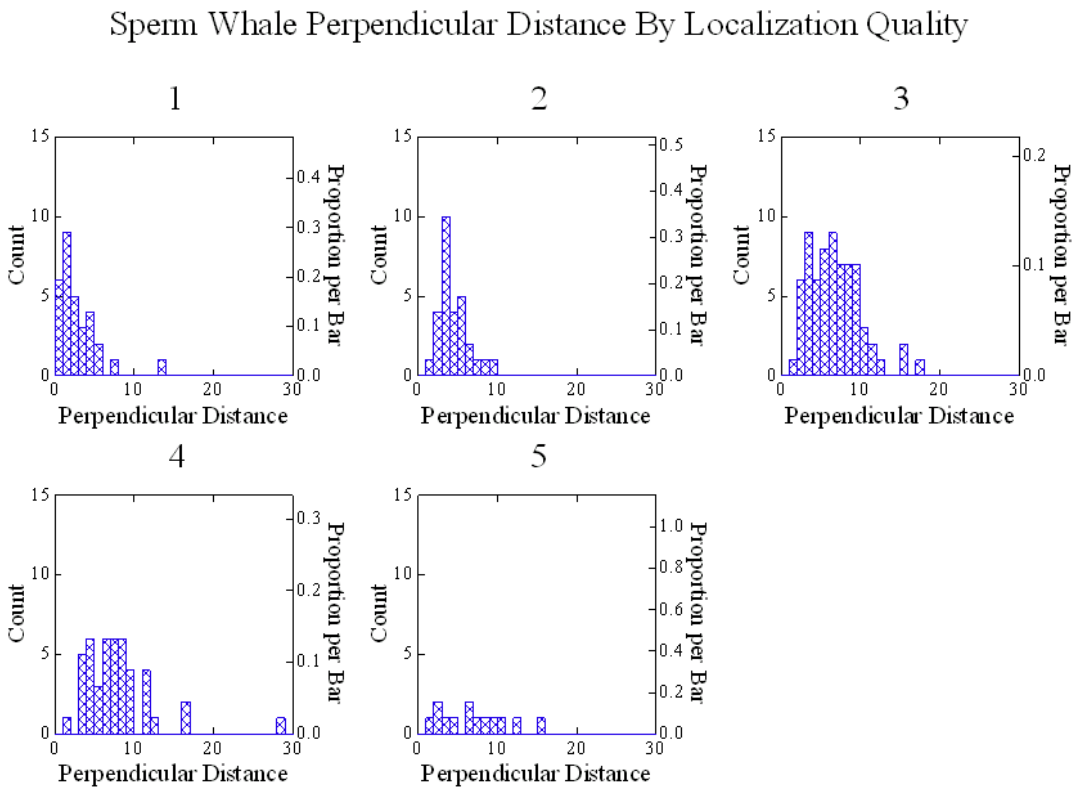


Figure 8. Perpendicular distance by localization quality.
Histograms are shown for each localization quality score (1–5, with 1 being highest quality). Perpendicular distance is shown along the x-axis and the count (in 1-km bins) is shown along the y-axis.

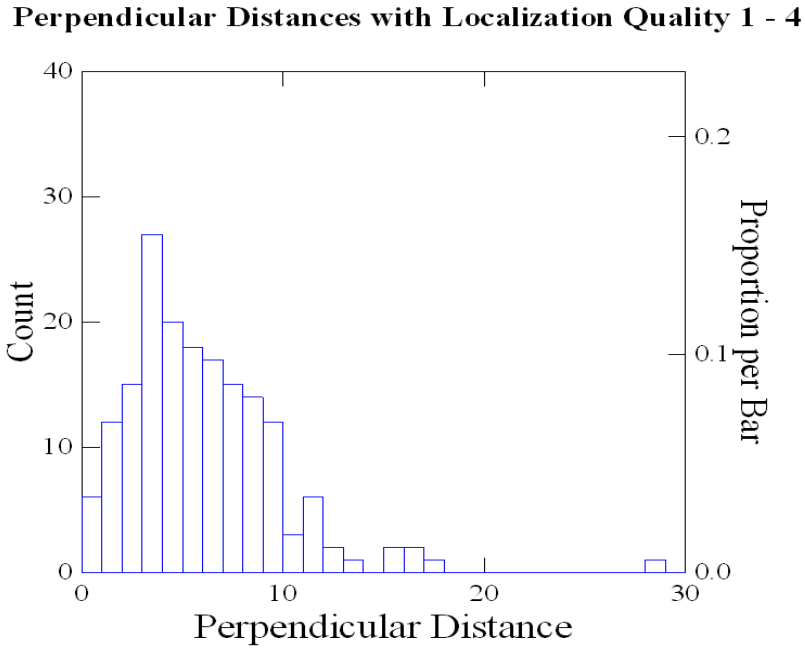


Figure 9. Histogram of perpendicular distances (km) (x-axis) for sperm whale quality 1–4 localizations is shown with counts (y-axis) for each 1-km bin.

RESULTS

Visual Survey Effort and Sightings

During the GOALS II survey, the visual team surveyed 4,504 km of 'full-effort' which corresponds to approximately 60 percent of the proposed survey effort. This includes 349 km of 'transit-effort,' which was not incorporated into the estimation of density and abundance within strata. There was an additional 375 km of 'fog-effort' (transect and transit) (**Figure 10**). Realized survey effort per stratum and effort mode is presented in **Table 2**. There were 802 sightings (1,998 individuals) of 13 confirmed marine mammal species (all effort included) with 91 percent recorded in on-effort mode. Confirmed species were Baird's and Cuvier's beaked whales, blue, sperm, fin, humpback, gray, killer, and minke whales, Dall's (*Phocoenoides dalli*) and harbor porpoise (*Phocoena phocoena*), and elephant (*Mirounga angustirostris*), and northern fur (*Callorhinus ursinus*) seals. There were an additional 162 sightings (261 individuals) of unidentified cetaceans and pinnipeds (all effort included) (**Table 3**; **Figures 11 through 22**; **Appendix B**).

The most frequently sighted species (all effort included) was Dall's porpoise (35 percent), sighted in all strata (notable concentration in the inshore and slope strata) and on transit. Fin whales (21 percent) were sighted in all strata and during transits but were absent from the western half of the seamount stratum. Humpback whales (11 percent) were sighted near Baranof Island (departure port) and sparsely within the offshore and seamount strata, were absent from the slope stratum, and were mainly concentrated in the inshore stratum. Fur seals (8 percent) were observed in all strata and during the transits. Killer whales (2 percent) were sighted on transit near the survey area and sparsely throughout the seamount, inshore, and slope strata, but were absent from the offshore stratum. All sperm whales (2 percent) were sighted within the slope stratum with the exception of a single sighting in the seamount stratum. Elephant seals (2 percent) were sighted on transits and in the slope and inshore strata only. Harbor porpoise (1 percent) were in the inshore and slope (on the shelf) strata. Beaked whales (1 percent) were sighted on transits and in the offshore, seamount, and slope strata. Blue whales (1 percent) were found only in the seamount stratum. Minke whales (< 1 percent) were sighted on transit and in the slope and seamount strata. One gray whale sighting was encountered on transit off Ugak Island, Kodiak.

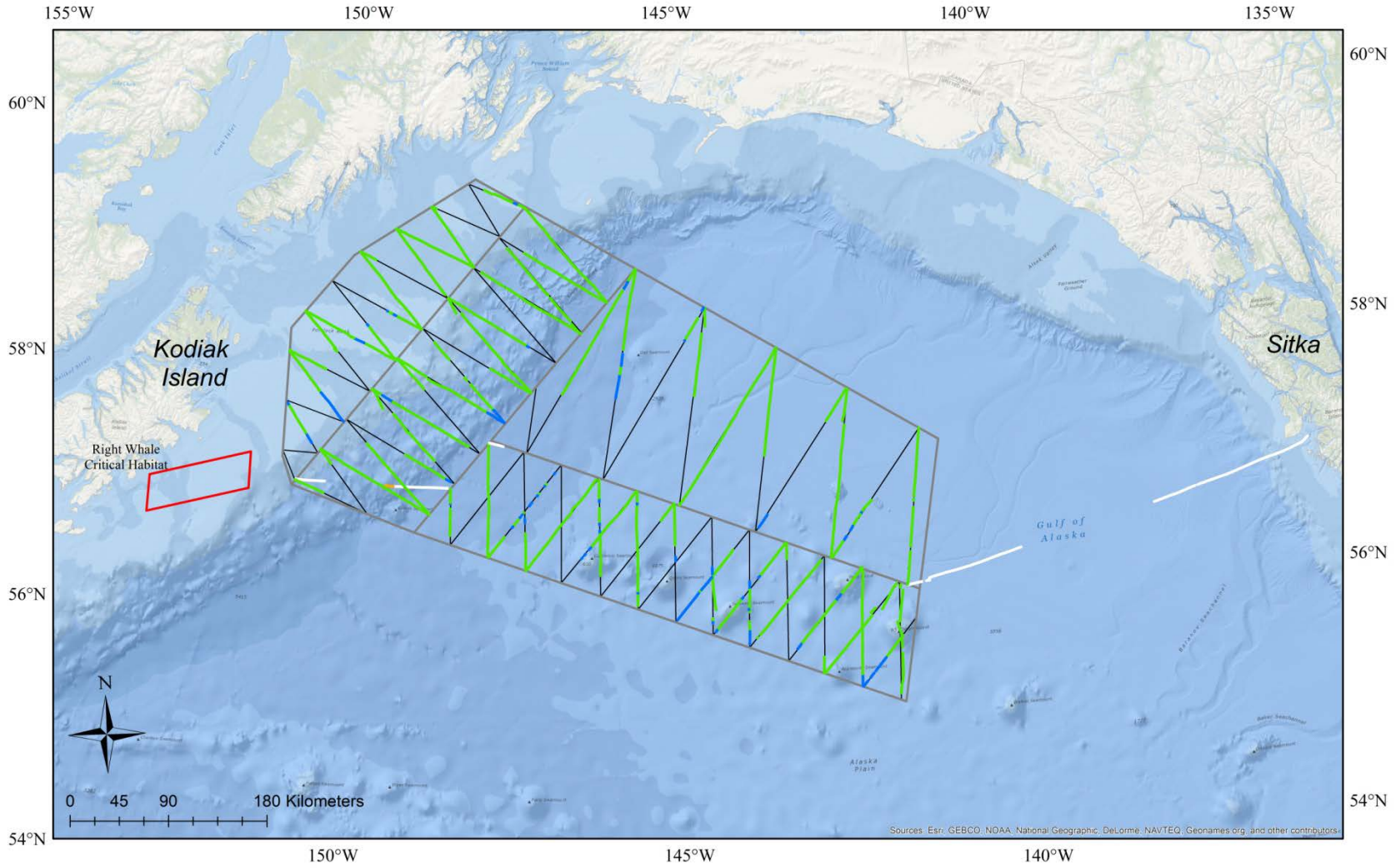


Figure 10. Completed visual effort for the GOALS II research cruise (survey transects = thin black line; 'full-effort' [two big eye observers, visible horizon and a Beaufort sea state ≤ 5] = green line; fog-effort [two big eye observers, no horizon and a Beaufort sea state ≤ 5] = blue line; 'full-effort' transit = white line; fog-effort transit = orange line).

Table 2. Proposed and realized effort for the GOALS II research cruise.

Stratum	Proposed Effort (km)	Full-effort (km)	Fog-Effort (km)	Proportion Surveyed (full-effort)
Inshore	1,296	673.1	67	51.9%
Offshore	1,752	926.1	72	52.9%
Seamount	2,610	1,278.7	174	48.9%
Slope	1,986	1,276.9	54	64.4%
Transit	0	348.8	8	
Total	**7,644**	**4,503.6**	**375**	**58.9%**

Table 3. All marine mammal sightings (individuals) from the GOALS II research cruise. On-effort includes both full-effort (two big eye observers, visible horizon, and a Beaufort Sea state ≤ 5 and fog-effort (two big eye observers, no horizon and a Beaufort sea state ≤ 5). Sightings include both transits and transects.

Species	On-effort	Off-effort	Total
Baird's beaked whale	6(49)	1(9)	7(58)
Blue whale	5(7)	0	5(7)
Cuvier's beaked whale	1(1)	0	1(1)
Dall's porpoise	320(859)	17(48)	337(907)
Northern elephant seal	15(15)	1(1)	16(16)
Fin whale	172(317)	28(75)	200(392)
Gray whale	0	1(25)	1(25)
Harbor porpoise	8(11)	0	8(11)
Humpback whale	91(295)	15(36)	106(331)
Killer whale	21(138)	0	21(138)
Minke whale	3(6)	0	3(6)
Northern fur seal	69(74)	9(9)	78(83)
Sperm whale	19(22)	0	19(22)
Unid beaked whale	5(8)	0	5(8)
Unid large whale	109(142)	13(18)	122(160)
Unid small whale	4(4)	0	4(4)
Unid dolphin	3(4)	0	3(4)
Unid porpoise	22(87)	0	22(87)
Unid seal	6(6)	0	6(6)
Total	**879(2045)**	**85(221)**	**964(2266)**

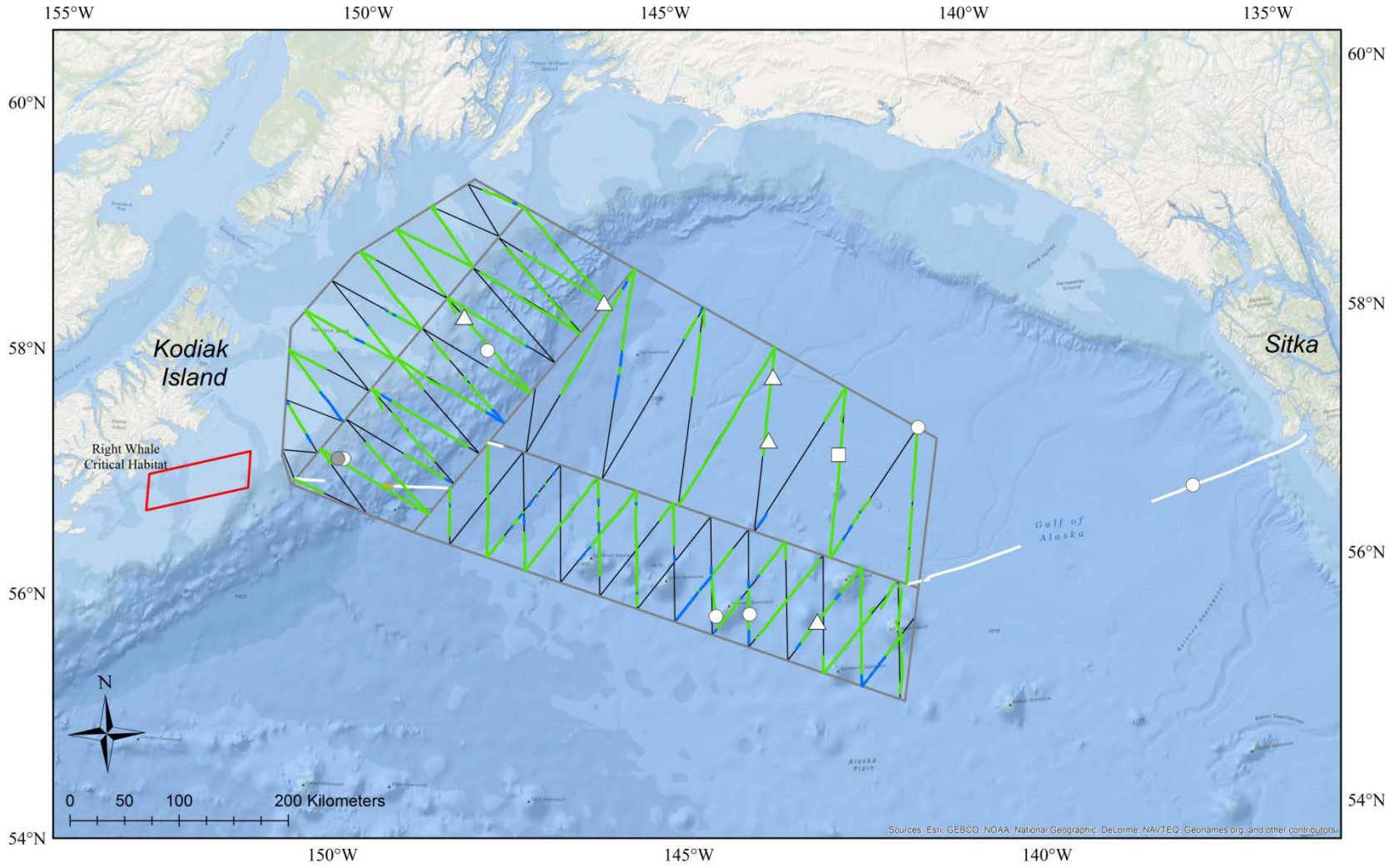


Figure 11. Visual effort and beaked whale sightings from the GOALS II research cruise (see Figure 10) (Sightings: white = on-effort, gray = off-effort; square = Cuvier's beaked whale, circle = Baird's beaked whale, triangle = unidentified beaked whale).

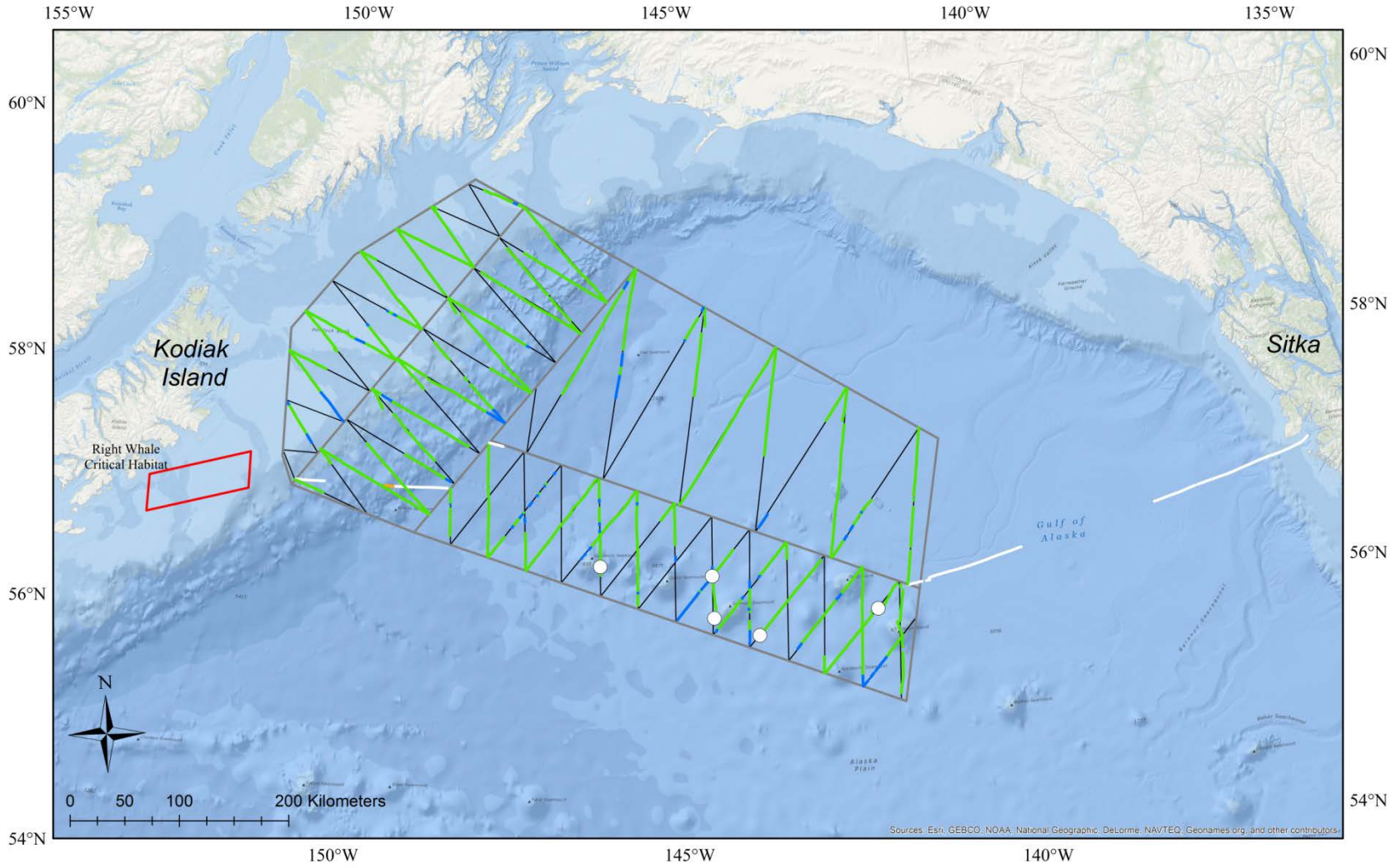


Figure 12. Visual effort and blue whale sightings from the GOALS II research cruise (Sightings: white = on-effort, gray = off-effort).

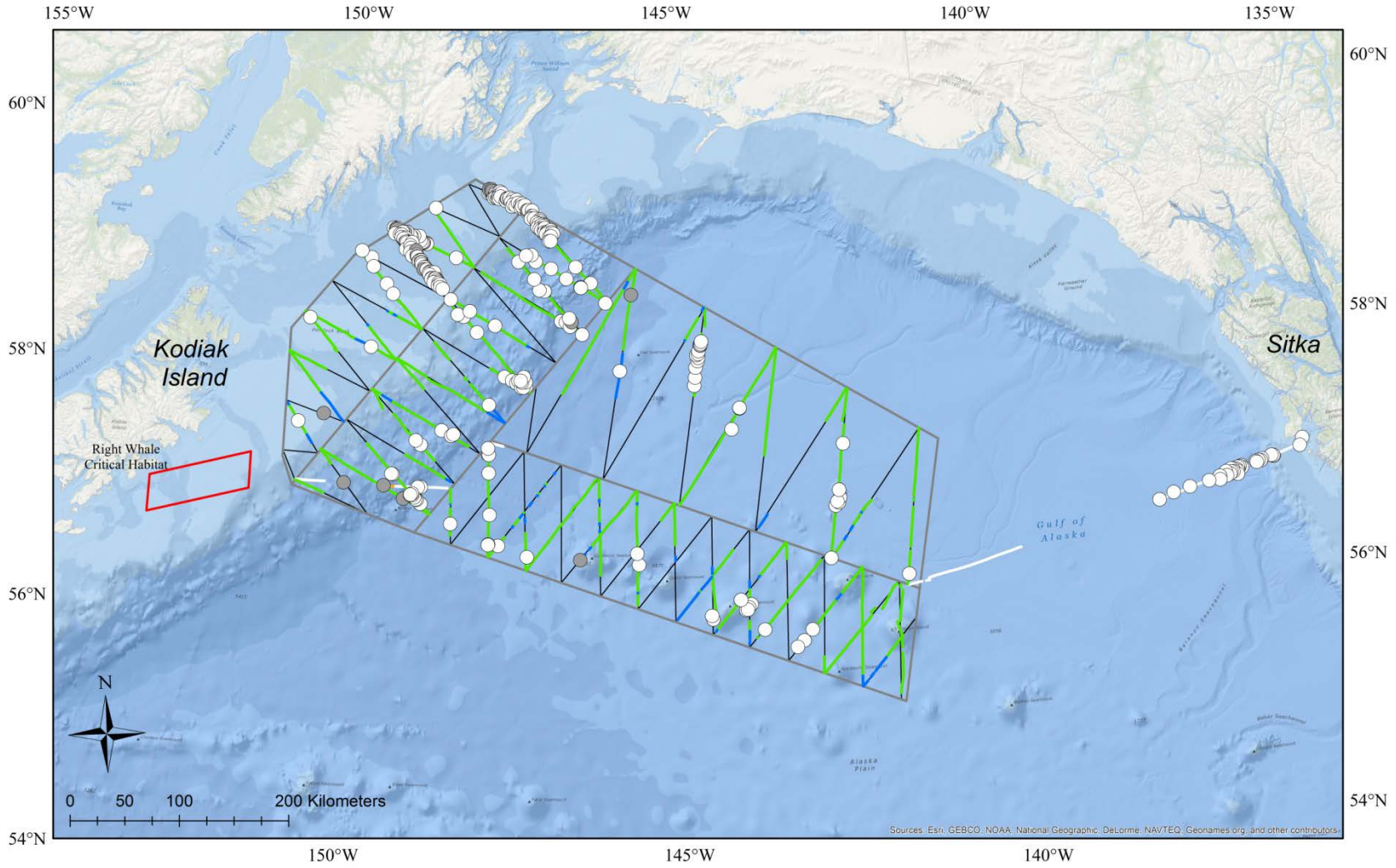


Figure 13. Visual effort and Dall's porpoise sightings from the GOALS II research cruise (Sightings: white = on-effort, gray = off-effort).

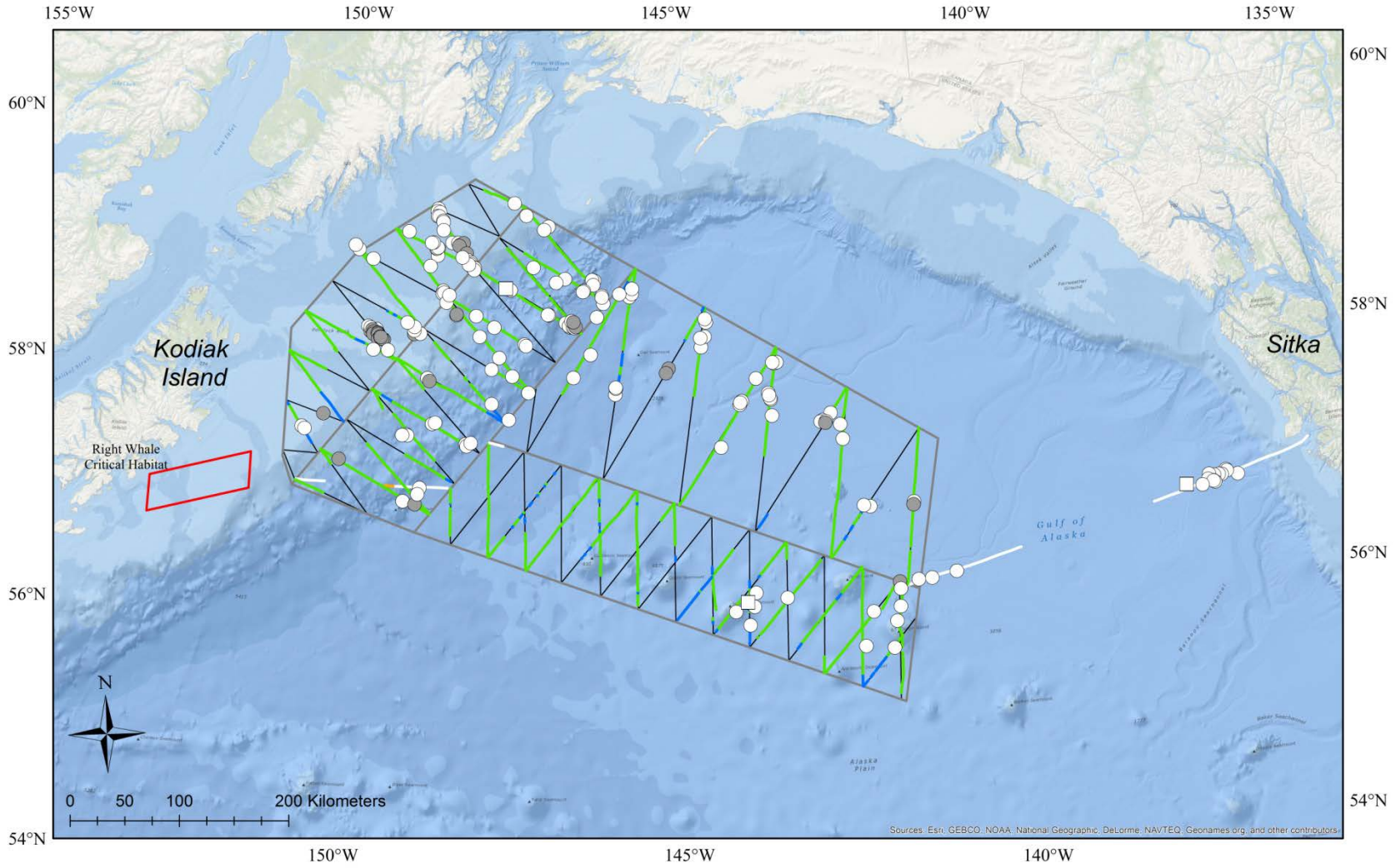


Figure 14. Visual effort and fin and fin/sei whale (fin/sei are included in unidentified large whale counts) sightings from the GOALS II research cruise
(Sightings: white = on-effort, gray = off-effort; circle = fin whale, square = fin or sei whale).

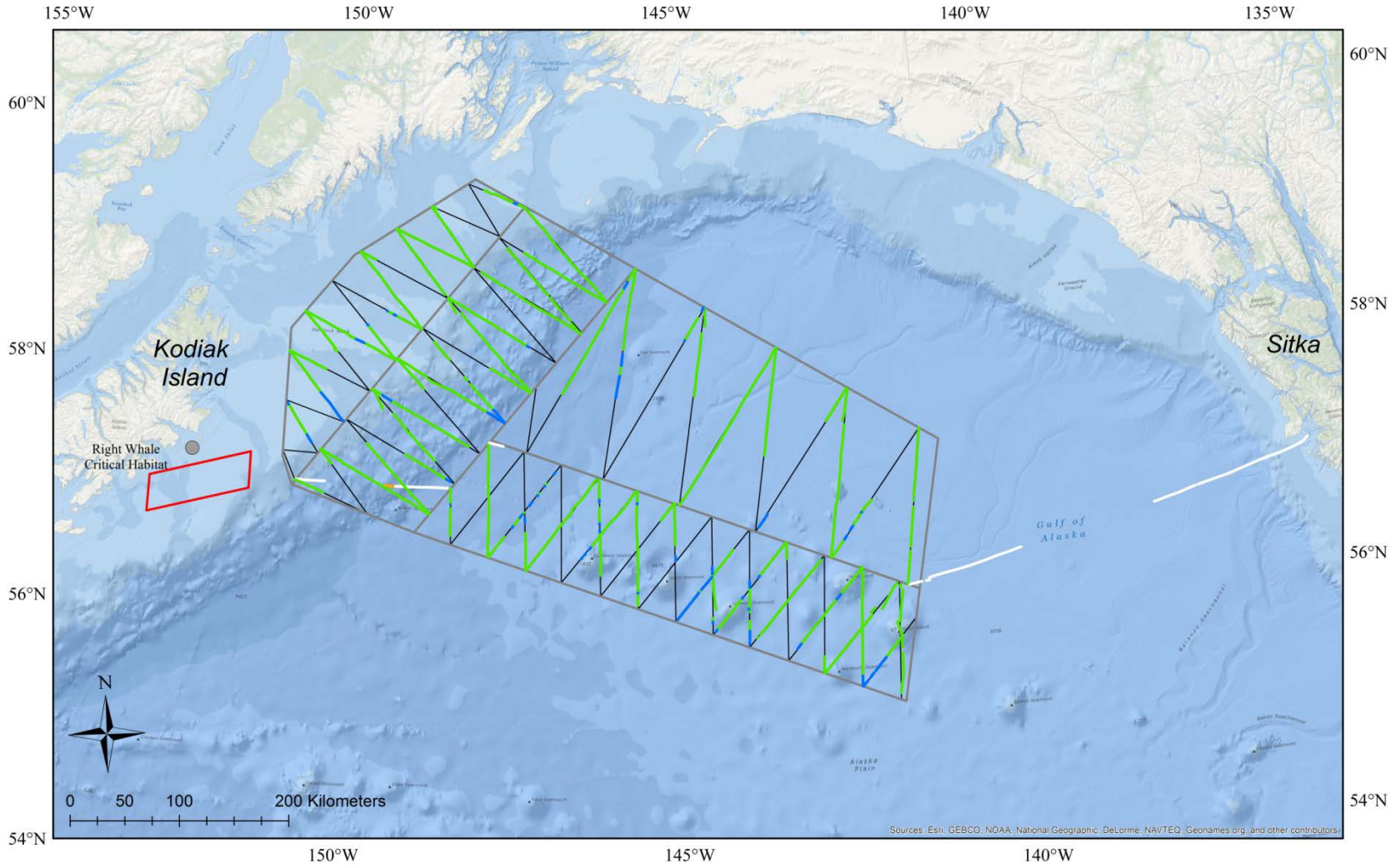


Figure 15. Visual effort and gray whale sightings from the GOALS II research cruise (Sightings: gray = off-effort).

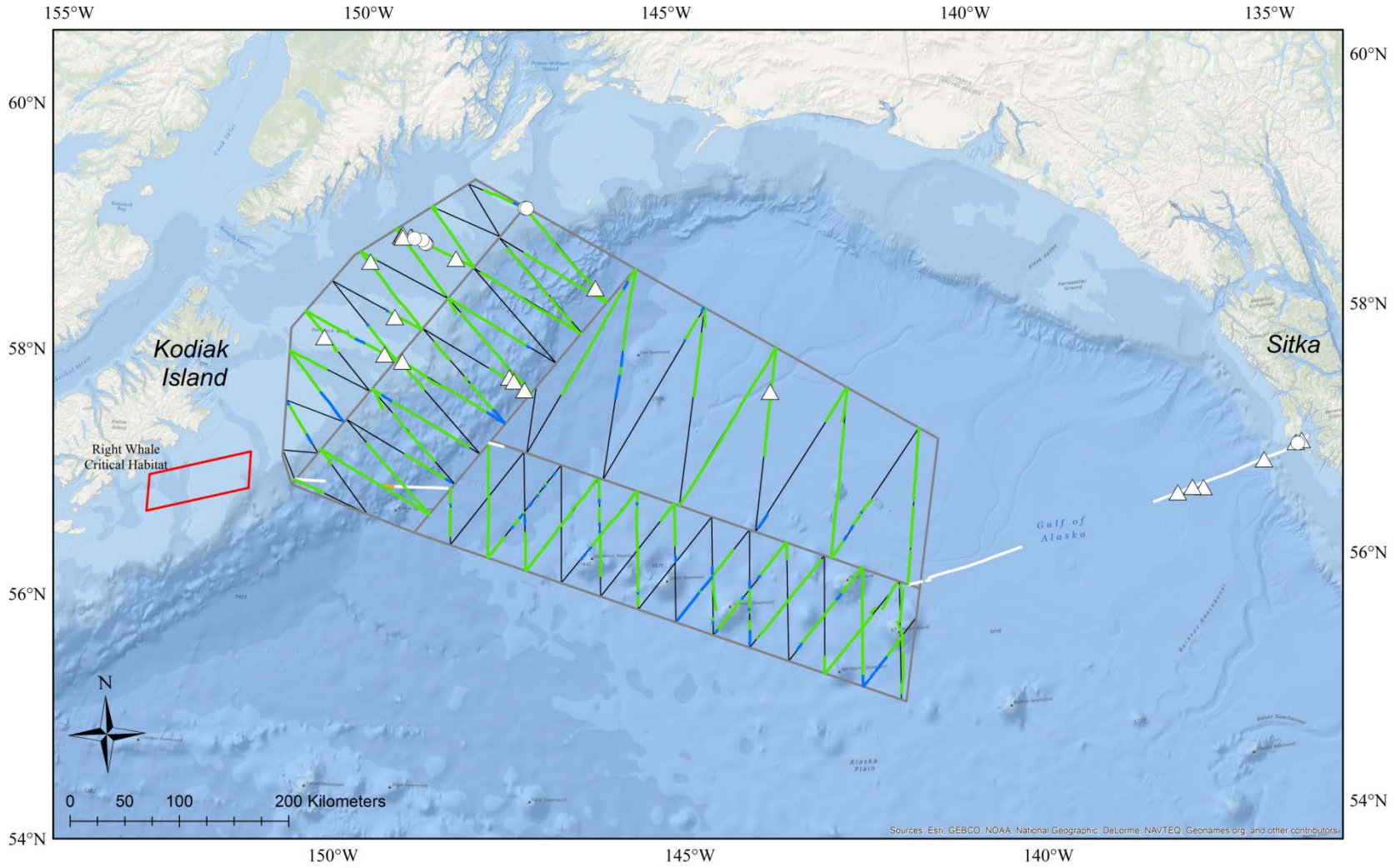


Figure 16. Visual effort and harbor and unidentified porpoise sightings from the GOALS II research cruise (Sightings: white = on-effort, gray = off-effort; harbor porpoise = circle, unid porpoise = triangle).

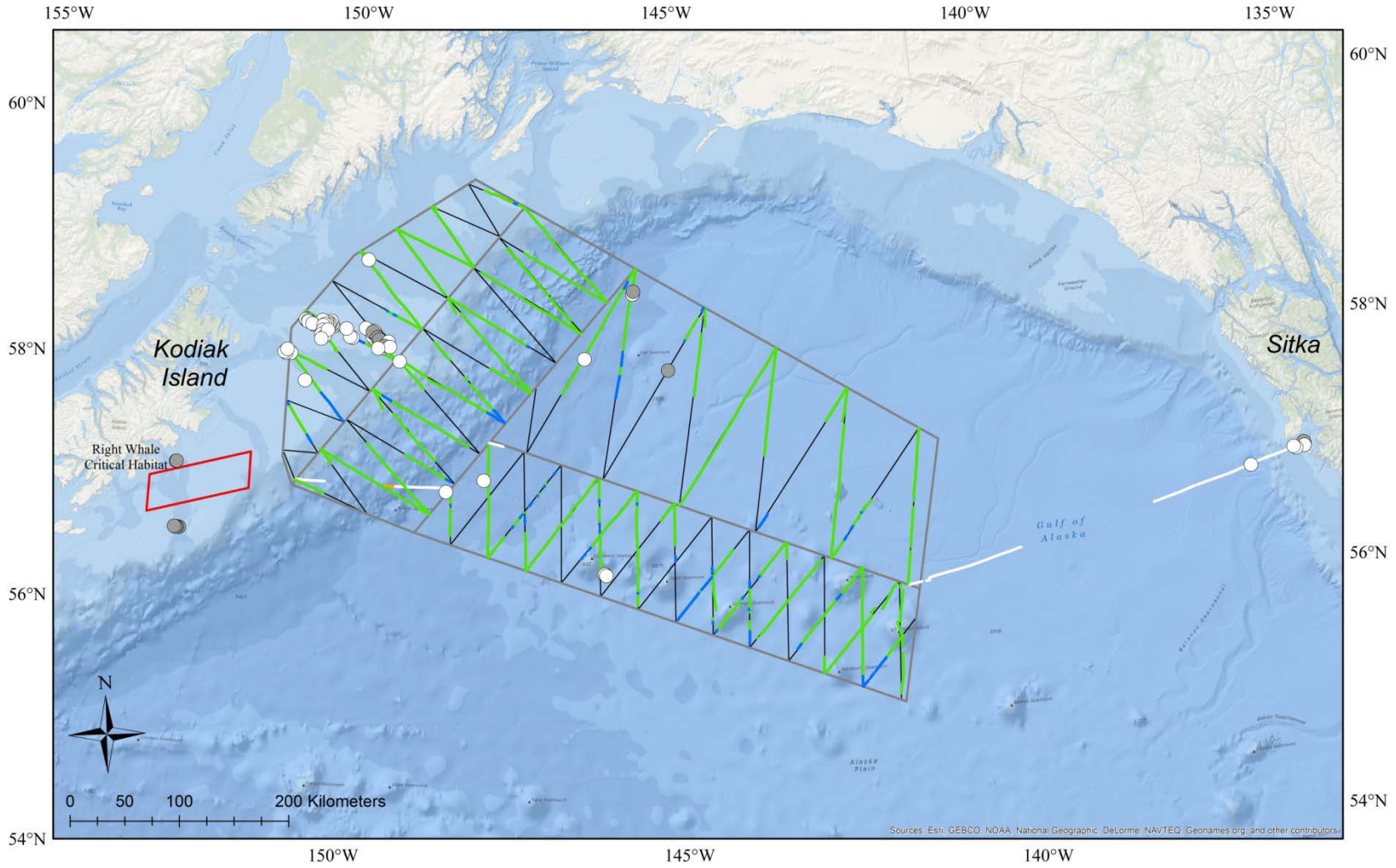


Figure 17. Visual effort and humpback whale sightings from the GOALS II research cruise (Sightings: white = on-effort, gray = off-effort).

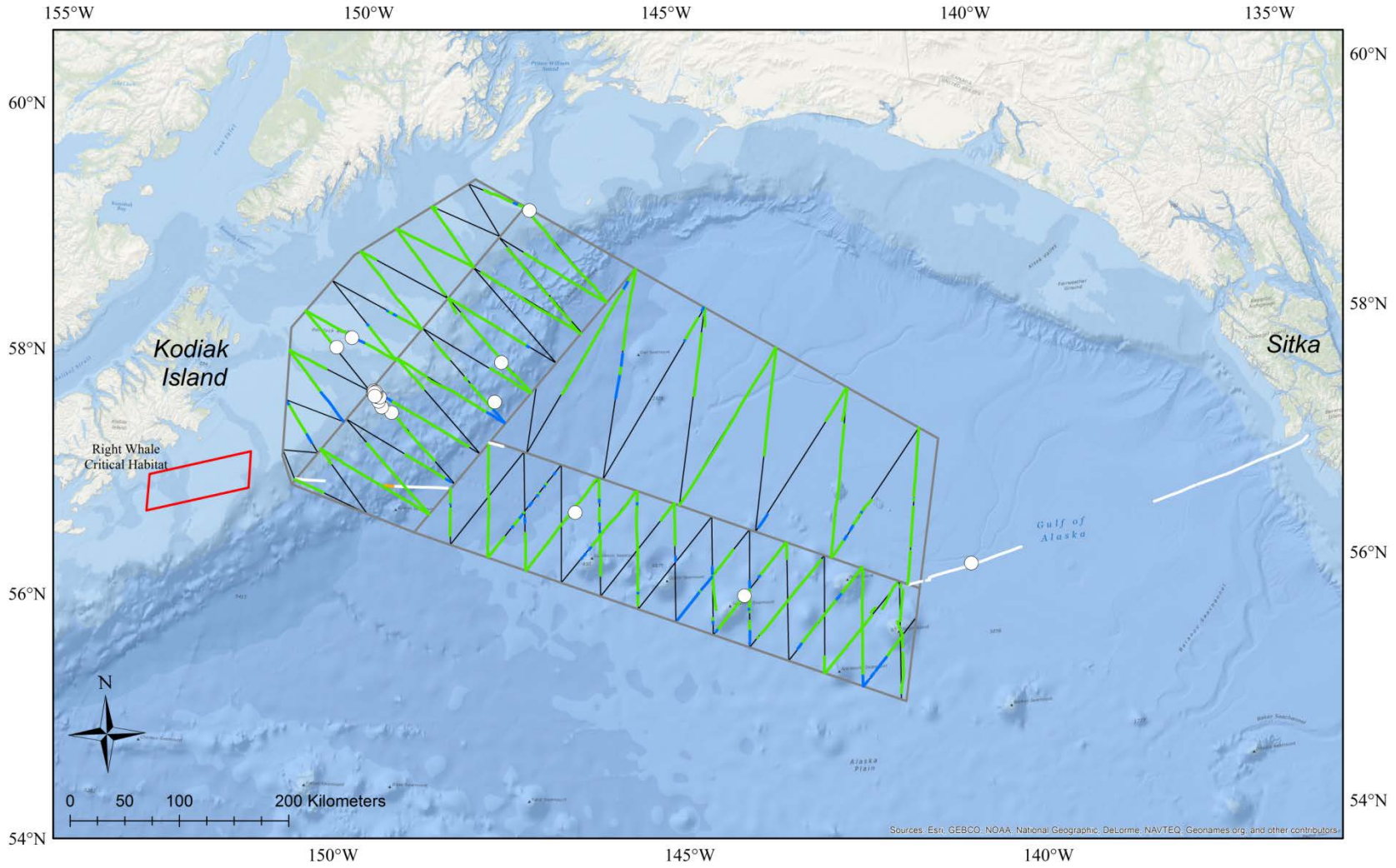


Figure 18. Visual effort and killer whale sightings from the GOALS II research cruise (Sightings: white = on-effort).

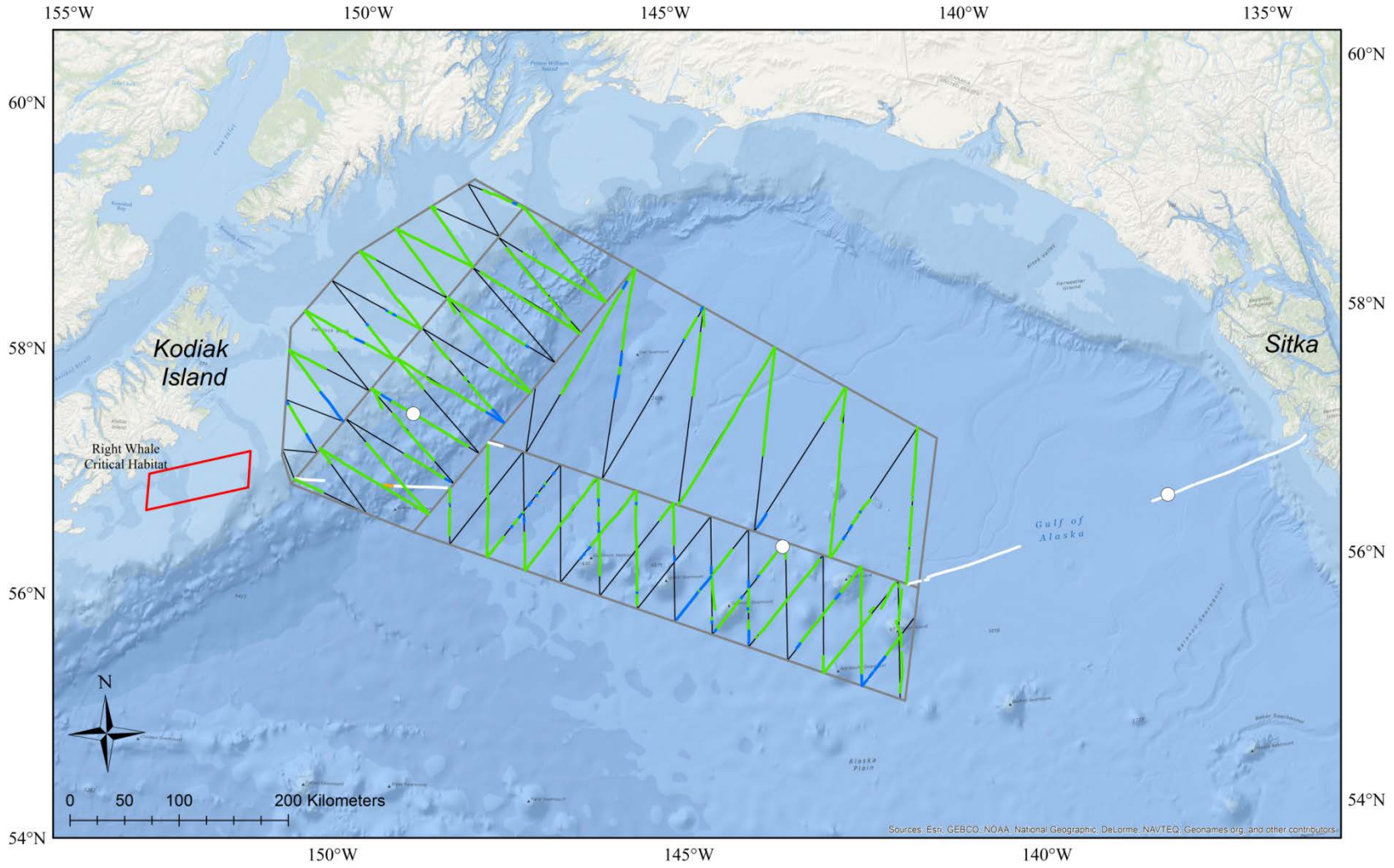


Figure 19. Visual effort and minke whale sightings from the GOALS II research cruise (Sightings: white = on-effort).

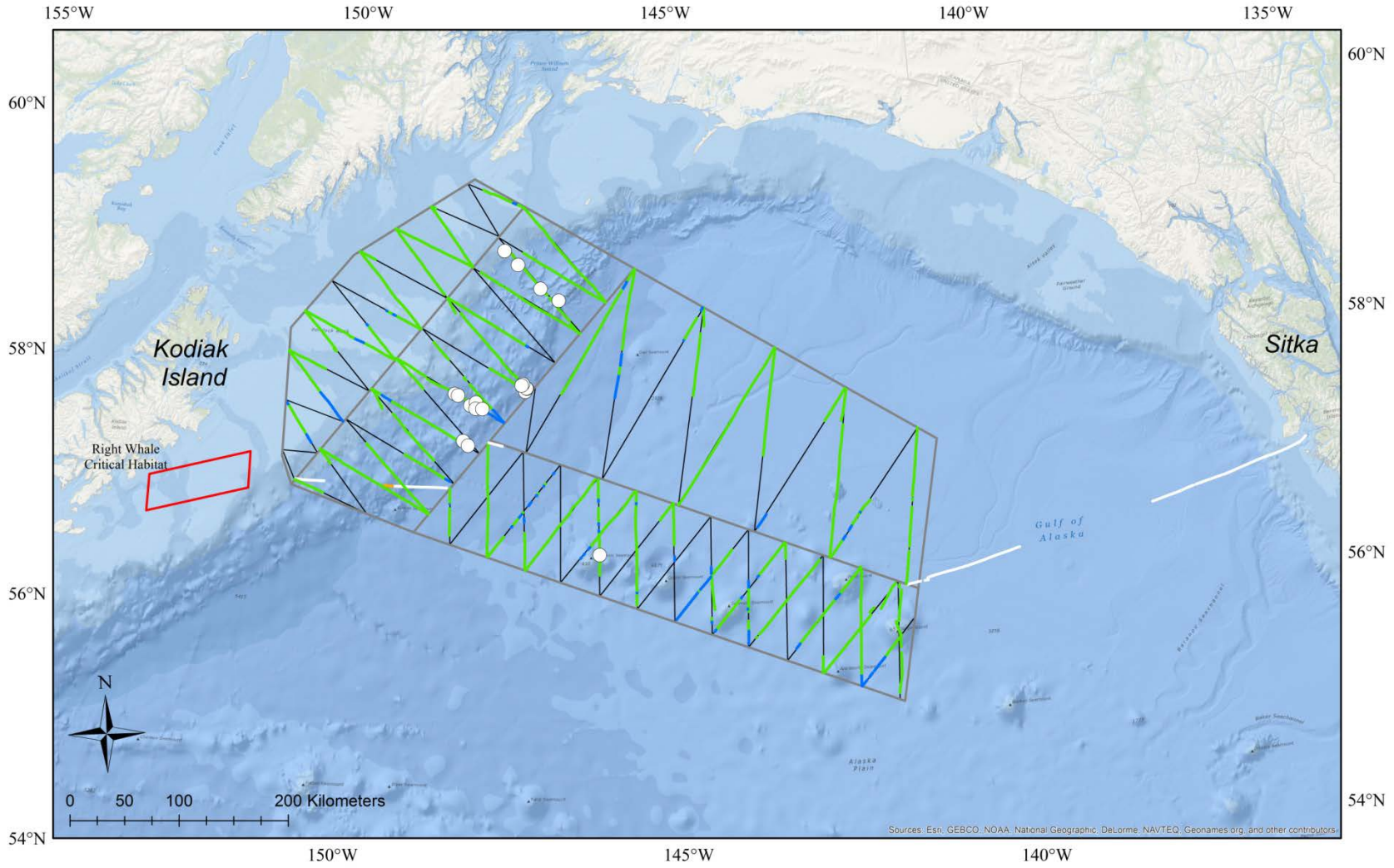


Figure 20. Visual effort and sperm whale sightings from the GOALS II research cruise (Sightings: white = on-effort).

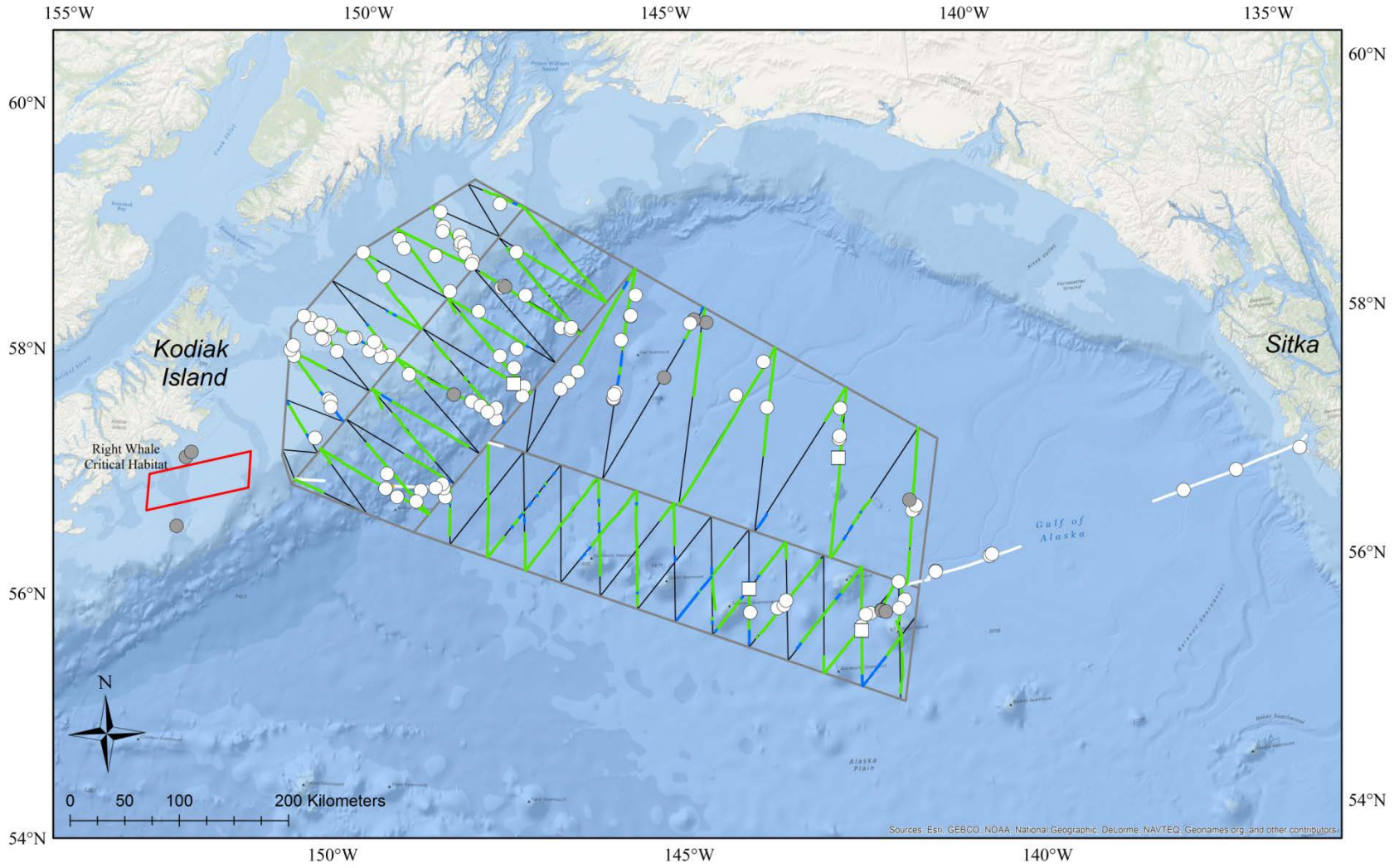


Figure 21. Visual effort and unidentified whale sightings from the GOALS II research cruise (Sightings: white = on-effort, gray = off-effort; circle = unidentified large whale, square = unidentified small whale).

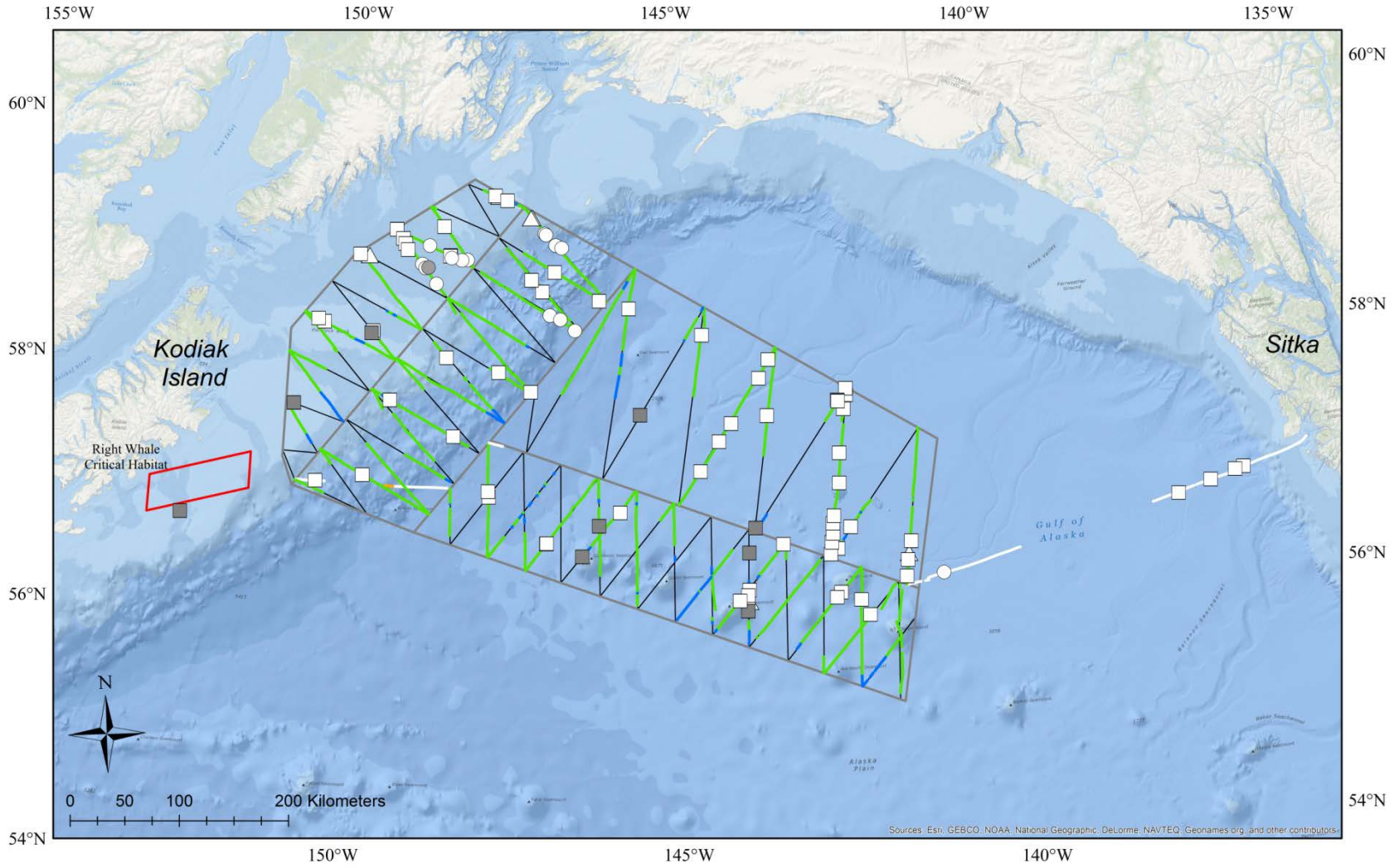


Figure 22. Visual effort and northern fur, elephant, and unidentified seal sightings from the GOALS II research cruise (Sightings: white = on-effort, gray = off-effort; circle = elephant seal, square = fur seal, triangle = unidentified seal).

Ship-based Passive Acoustics – Towed-Hydrophone Array

Acoustic survey effort was conducted during 23 of 26 days of the survey, resulting in 426 hr of 'standard' real-time monitoring along 6,304 km of trackline (**Table 4**; **Figure 23**). This represents an average of 18.5 hr and 274 km of acoustic monitoring effort per day. An additional 30 hr of 'non-standard' and 'chase' effort was conducted along 374 km of trackline. For both types of effort combined, passive acoustic data collection totaled 456 hr and 6,678 km, for a daily average of 19.8 hr and 290 km of trackline effort. In addition, approximately 522 hours of mid-frequency (192-kHz sampling rate) recordings, and over 130 hours of high-frequency (480-kHz sampling rate) recordings (not mutually exclusive time periods) were obtained (**Table 5**).

There was a total of 379 acoustic encounters of marine mammals, of which 267 (70 percent) were localized (**Table 6**; **Appendix C**). The species encountered listed by frequency are: sperm whales (n=241), Cuvier's beaked whales (n=34), killer whales (n = 32), unidentified porpoise (n=13), Baird's beaked whales (n=9), Stejneger's beaked whales (n=6), offshore killer whales (n=3) and Dall's porpoise (n=3). A total of 34 (9 percent of) acoustic encounters were matched to visual sightings (**Table 6**). There were 241 (63 percent) sperm whale acoustic encounters of which 176 (73 percent) were localized in real time (**Table 6**; **Figure 24**). An additional 11 sperm whale encounters were localized during post-processing efforts, which represents an increase of 6 percent over the real-time localization total (**Table 7**). There was a total of 49 beaked whale encounters, of which 34 (69 percent) were localized (**Table 6**; **Figure 25**). These included all three species: Cuvier's beaked whale, Baird's beaked whale, and Stejneger's beaked whale. One additional encounter of Cuvier's beaked whales was identified during post-processing efforts. Additionally, there were 32 encounters of killer whales, of which 18 (56 percent) were localized (**Table 6**; **Figure 26**). Three of the killer whale encounters were classified as the offshore ecotype based on the presence of high-frequency modulated signals (Filatova et al. 2012; Simonis et al. 2012). Finally, by utilizing the high-frequency hydrophone monitoring system within the inshore stratum (this system was not used during surveys of the other strata in order to optimize the system for sperm and beaked whales), 15 encounters were classified as unidentified porpoise and three encounters were identified as Dall's porpoise (**Table 6**; **Figure 27**). Of the 43 unidentified cetaceans detected, 33 were given secondary identifications. The secondary identifications included: probable Cuvier's beaked whale (n=1), possible Cuvier's beaked whale (n=1), probable Stejneger's beaked whale (n=3), probable killer whale (n=14), and possible killer whale (n=5). Thirteen acoustic encounters remained classified as unidentified odontocetes (i.e., a species classification was not possible in the field).

Sperm whales were encountered acoustically primarily in the slope stratum (63 percent of total sperm whale encounters), followed by the offshore (20 percent) and seamount (16 percent) strata (**Figure 24**). One sperm whale was heard while on 'non-standard' effort, since the encounter occurred on transit between transect lines. Baird's beaked whales were heard primarily in the slope stratum (56 percent), followed by the seamount (33 percent) and offshore (11 percent) strata (**Figure 25**). In contrast, Cuvier's beaked whales were detected primarily in the seamount stratum (59 percent), followed by the offshore (29 percent) and slope (9 percent) strata. Killer whales were found in all strata, but primarily in the offshore (39 percent) and seamount (37 percent) strata (**Figure 26**). All porpoise acoustic encounters occurred in the inshore stratum,

however this was the only stratum in which high-frequency recording and monitoring was conducted (**Figure 27**).

Table 4. Towed-hydrophone array acoustic monitoring effort for the GOALS II research cruise.

Date	Monitoring Standard Effort		Monitoring Vis Chase Effort		Monitoring Non-Standard Effort	
m/dd/yyyy	hh:mm:ss	km	hh:mm:ss	km	hh:mm:ss	km
6/25/2013	-	-	-	-	-	-
6/26/2013	16:36:49	240.3	0:47:02	9.1	-	-
6/27/2013	18:23:46	272.1	2:30:47	28.8	-	-
6/28/2013	20:34:38	306.1	2:08:34	33.1	-	-
6/29/2013	15:00:48	201.30	-	-	-	-
6/30/2013	17:10:20	275.2	0:13:22	3.6	-	-
7/1/2013	19:36:11	282.1	0:25:46	8.1	-	-
7/2/2013	22:25:08	342.5	-	-	-	-
7/3/2013	20:03:00	319.8	1:30:00	19.7	-	-
7/4/2013	20:38:54	289.5	0:51:08	10.0	-	-
7/5/2013	22:58:58	343.7	-	-	-	-
7/6/2013	21:07:51	317.5	-	-	-	-
7/7/2013	12:16:29	174.0	-	-	4:15:58	56.4
7/8/2013	19:20:46	300.4	3:34:59	30.7	-	-
7/9/2013	21:52:15	338.3	1:09:59	17.0	-	-
7/10/2013	21:38:29	325.9	0:58:59	12.8	-	-
7/11/2013	19:53:00	304.5	2:04:10	25.4	-	-
7/12/2013	22:24:56	340.1	0:47:53	9.8	-	-
7/13/2013	20:23:52	312.3	2:02:26	26.0	-	-
7/14/2013	18:35:49	263.3	1:51:58	21.6	-	-
7/15/2013	17:37:26	231.9	2:03:56	20.3	-	-
7/16/2013	16:46:46	230.9	2:15:00	28.2	-	-
7/17/2013	20:10:48	286.1	0:16:00	3.6	-	-
7/18/2013	0:26:12	6.3	-	-	-	-
TOTAL	**426:03:11**	**6304.1**	**25:31:59**	**307.8**	**4:15:58**	**56.4**

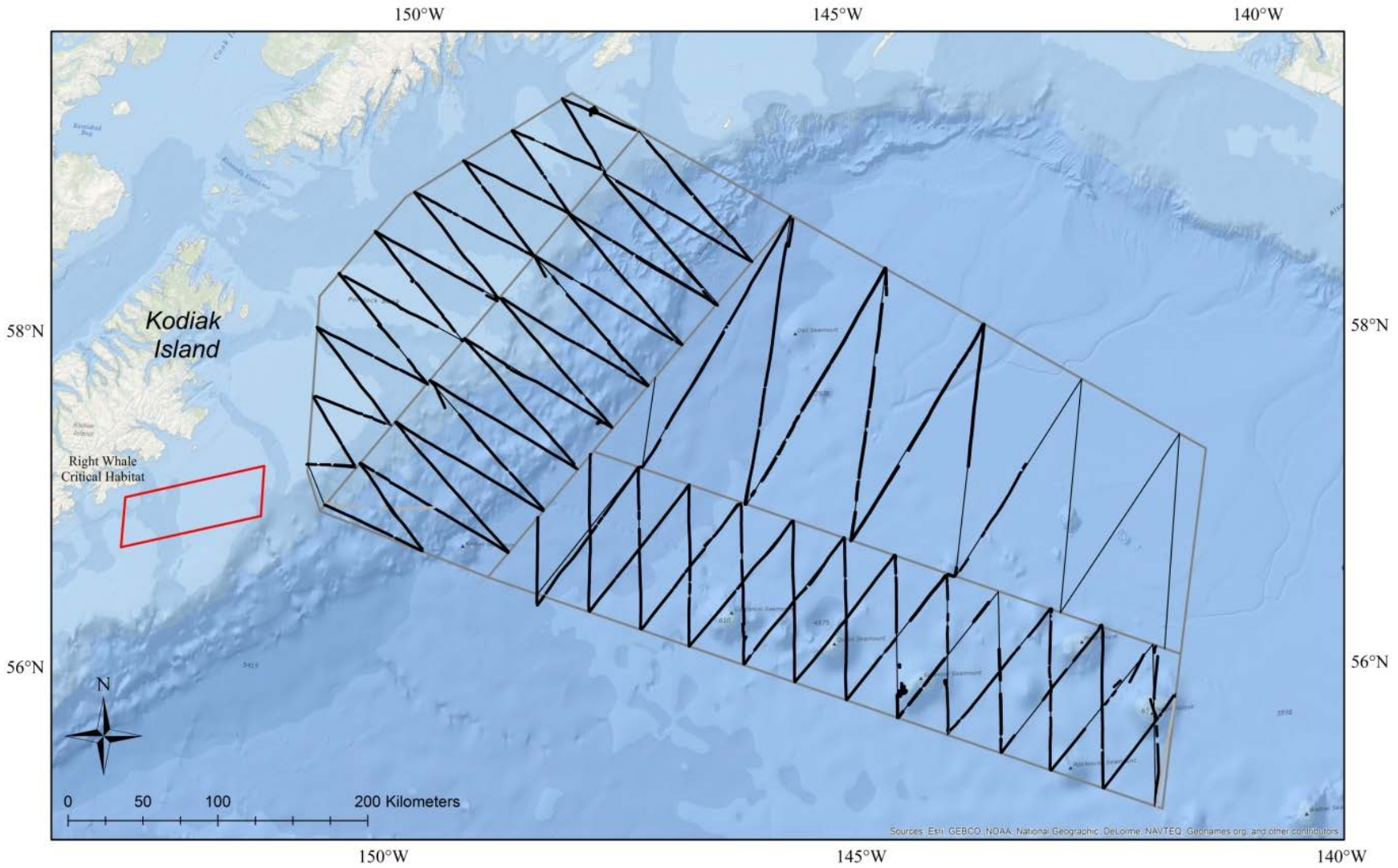


Figure 23. Completed towed hydrophone array acoustic effort during the GOALS II research cruise. Acoustic effort is indicated by thick black sections along the survey tracklines (thin black line).

Table 5. Towed-hydrophone array acoustic recording effort for mid-frequency (MF) and high-frequency (HF) hydrophones.

Date	MF Recording Effort		HF Recording Effort	
m/dd/yyyy	(hh:mm:ss)	(km)	(hh:mm:ss)	(km)
6/25/2013	10:21:53	-	11:07:30	-
6/26/2013	22:17:58	317.6	9:17:02	-
6/27/2013	23:59:52	347.9	19:17:16	-
6/28/2013	23:59:13	357.9	-	-
6/29/2013	21:41:23	308.3	-	-
6/30/2013	23:44:30	365.1	-	-
7/1/2013	23:18:38	349.5	-	-
7/2/2013	23:34:57	360.1	-	-
7/3/2013	23:55:01	376.0	-	-
7/4/2013	23:57:39	331.2	-	-
7/5/2013	23:56:09	357.6	-	-
7/6/2013	23:59:54	360.8	-	-
7/7/2013	18:30:11	256.3	-	-
7/8/2013	23:59:45	345.7	-	-
7/9/2013	23:59:02	368.8	-	-
7/10/2013	23:57:39	358.9	-	-
7/11/2013	23:59:53	360.8	-	-
7/12/2013	23:59:02	360.6	-	-
7/13/2013	23:57:58	359.8	-	-
7/14/2013	20:30:52	280.6	19:43:52	275.4
7/15/2013	21:57:58	295.4	23:59:56	309.02
7/16/2013	23:53:00	323.5	23:58:48	324.7
7/17/2013	23:55:44	336.5	22:06:41	312.8
7/18/2013	0:38:44	9.2	0:38:44	9.2
	522:06:55	**7,488.1**	**130:09:49**	**1,231.1**

Table 6. Towed-hydrophone array acoustic encounters from the GOALS II research cruise.

Species	Detection Type		Totals	
	Acoustic Only	Visual & Acoustic	Total	Number Localized
Baird's beaked whale	5	4	**9**	4
Cuvier's beaked whale	33	1	**34**	25
Stejneger's beaked whale*	6	-	**6**	6
Killer whale	23	9	**32**	18
Offshore killer whale	3	-	**3**	2
Sperm whale	226	15	**241**	187
Humpback Whale	-	1	**1**	0
Dall's porpoise	-	3	**3**	2
Unid porpoise	12	1	**13**	4
Unidentified Cetaceans				
Prob Cuvier's beaked whale	1	-	**1**	0
Poss Cuvier's beaked whale	1	-	**1**	1
Prob killer whale	14	-	**14**	6
Poss killer whale	5	-	**5**	0
Prob Stejneger's beaked whale	3	-	**3**	2
Unid odontocete	13	-	**13**	7
Total	**345**	**34**	**379**	**264**

*Stejneger's beaked whale designation was based solely on spatio-temporal patterns of beaked whale echolocation signals described by Baumann-Pickering et al. (2012b; 2013).

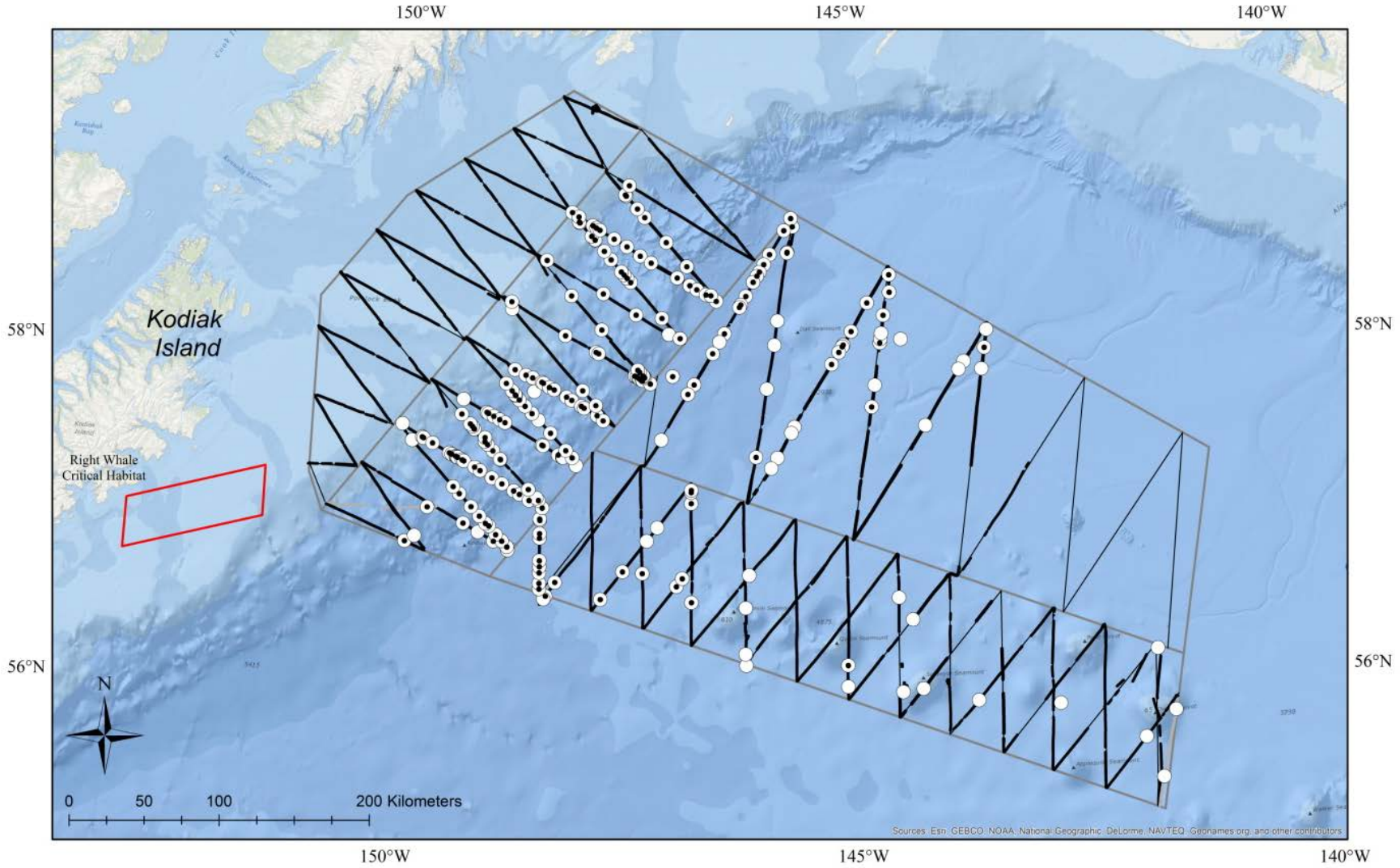


Figure 24. Towed-hydrophone array effort and sperm whale acoustic encounters along the GOALS II survey tracklines. White circles indicate sperm whale encounters, and overlapping (black) circles indicate encounters that were localized (i.e., perpendicular distance was obtained).

Table 7. Sperm whale localizations from the towed-hydrophone array obtained during post processing
(AKDT = Alaska daylight time; LADD = Latitude in decimal degrees; LODD = Longitude in decimal degrees; Beam Dist = distance from vessel at ~90˚ in kilometers).

Date/Time (AKDT)	LADD	LODD	Beam Dist (km)	Stratum	Localization Quality
7/1/13 9:45 AM	58.389	-144.531	9.15	offshore	2
7/1/13 10:25 AM	58.493	-144.530	11.6	offshore	4
7/2/13 6:57 PM	58.162	-146.412	4.4	offshore	5
7/2/13 7:57 PM	58.043	-146.546	8.85	offshore	3
7/9/13 2:10 PM	57.662	-149.351	9.2	slope	3
7/9/13 9:58 PM	57.490	-148.451	10.6	slope	3
7/10/13 1:48 PM	57.760	-148.128	7.3	slope	4
7/11/13 6:06 AM	58.050	-147.861	6.1	slope	3
7/11/13 6:13 AM	58.041	-147.832	9.1	slope	3
7/12/13 2:26 AM	58.255	-147.118	6.85	slope	3
7/12/13 4:55 PM	58.356	-146.502	9.6	slope	3

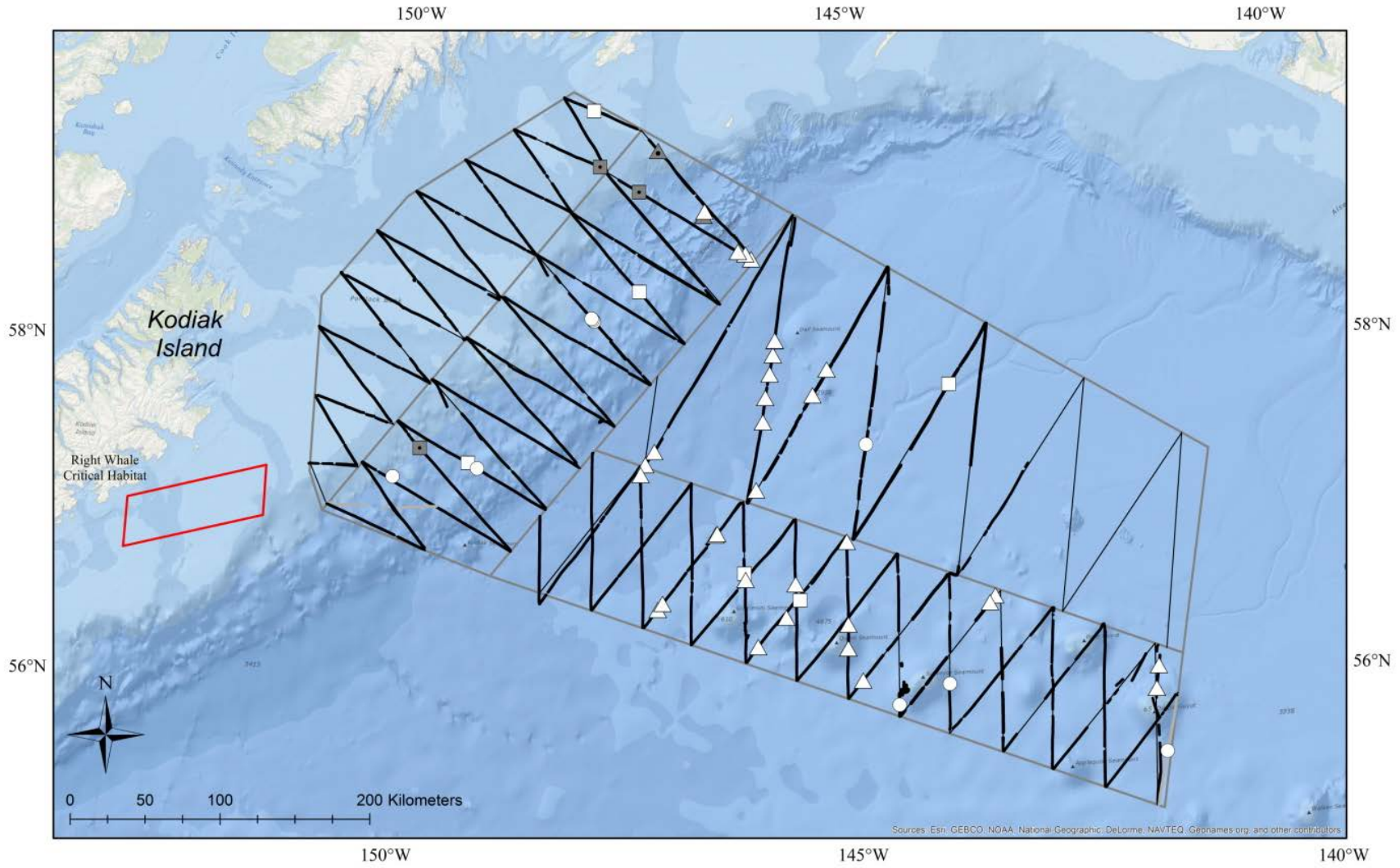


Figure 25. Towed-hydrophone array effort and beaked whale acoustic encounters along the GOALS II survey trackline (white circle = Baird's beaked whale, white triangle = Cuvier's beaked whale, white square = Stejneger's beaked whale; open gray triangle = probable Cuvier's beaked whale, gray triangle with dot = possible Cuvier's beaked whale, open gray square = probable Stejneger's beaked whale, gray square with dot = possible Stejneger's beaked whale).

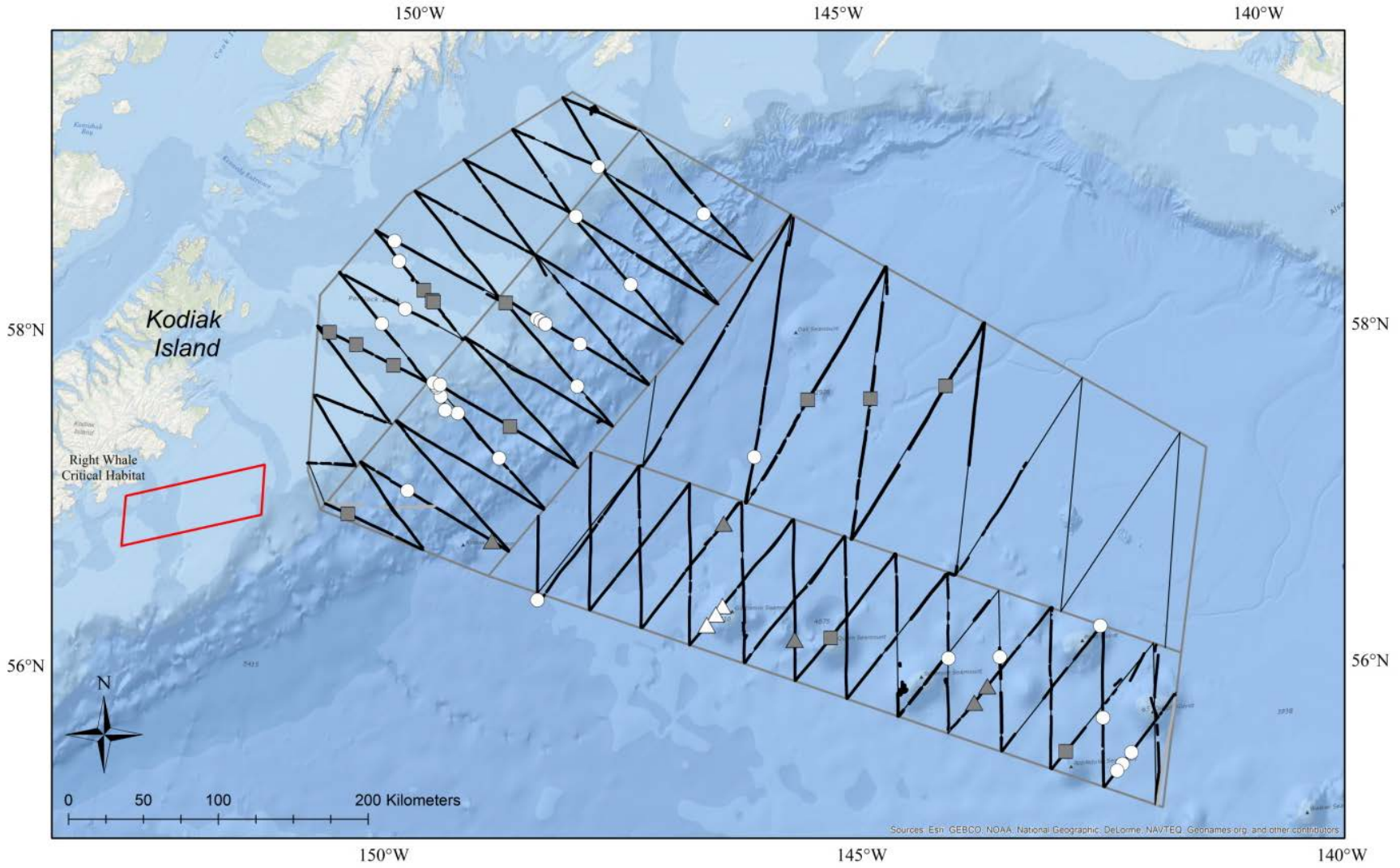


Figure 26. Towed-hydrophone array effort and killer whale acoustic encounters along the GOALS II survey trackline (white circle = killer whale, gray square = probable killer whale, white triangle = probable offshore killer whale, gray triangle = possible killer whale).

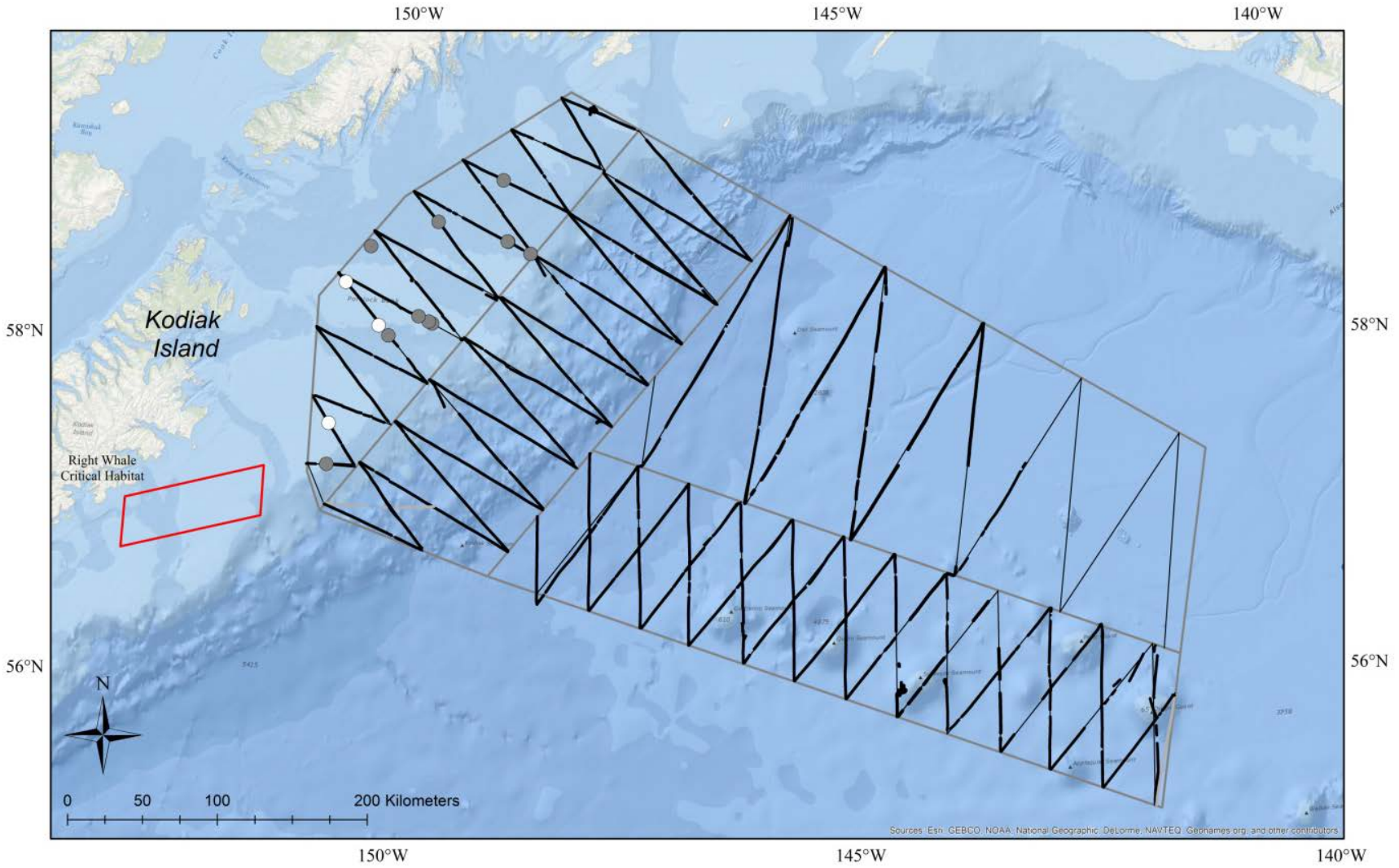


Figure 27. Towed-hydrophone array effort and porpoise acoustic encounters along the GOALS II survey trackline (white circle = Dall's porpoise, gray circle = unidentified porpoise).

Ship-Based Passive Acoustics – DiFAR Sonobuoys

A total of 186 sonobuoys were deployed during the GOALS II survey (**Figure 28; Appendix D**). Of these, 71 were 77C (65 SPW, 6 USSI), and 115 were 53F (97 SPW, 18USSI). The overall sonobuoy success rate was 93.5 percent (174 sonobuoys; **Table 8**). Sonobuoys were analyzed in real time for presence/absence of calls from cetaceans. Calls were detected on 80 percent (140) of the sonobuoys, including the study area and transit to Kodiak, Alaska (**Figure 28**). There were seven confirmed species detected: blue, fin, humpback, killer, sei, North Pacific right, and sperm whales (**Figures 29 through 35**) and additional call detections that could not be classified to species (**Figure 36**).

The most frequently detected species was fin whales (52 percent of all call detections), followed by sperm (26 percent), killer (18 percent), humpback (13 percent), sei (10 percent), North Pacific right (.02 percent), and blue (.02 percent) whales. Fin whale detections were generally evenly distributed throughout all strata (**Figure 30**). Sperm whales were detected on sonobuoys within all strata with a notable absence in the eastern half of the offshore stratum. A majority of the sonobuoys deployed in the slope stratum (38 of 47) had sperm whale detections (**Figure 34**). Killer whales were detected in all strata with the majority within the inshore and slope strata **(Figure 32**). A majority of humpback whale detections occurred within the inshore stratum, with only a few detections in the offshore and seamount strata. Only possible, not confirmed, calls were detected within the slope stratum (**Figure 31**). Sei whale calls were detected in all strata (**Figure 35**). North Pacific right whales were documented outside the study area in Barnabus Trough, west-southwest of the inshore stratum. Localizations were obtained on two individuals with a third unique acoustic detection (no localization obtained) about 32 km to the north of the other animals. Possible right whale calls were documented in the inshore stratum (**Figure 33**). Blue whales were only detected on three sonobuoys deployed in the seamount stratum (**Figure 29**). Lastly, there were calls on five sonobuoys in the inshore, offshore, and seamount strata that could not be identified (**Figure 36**).

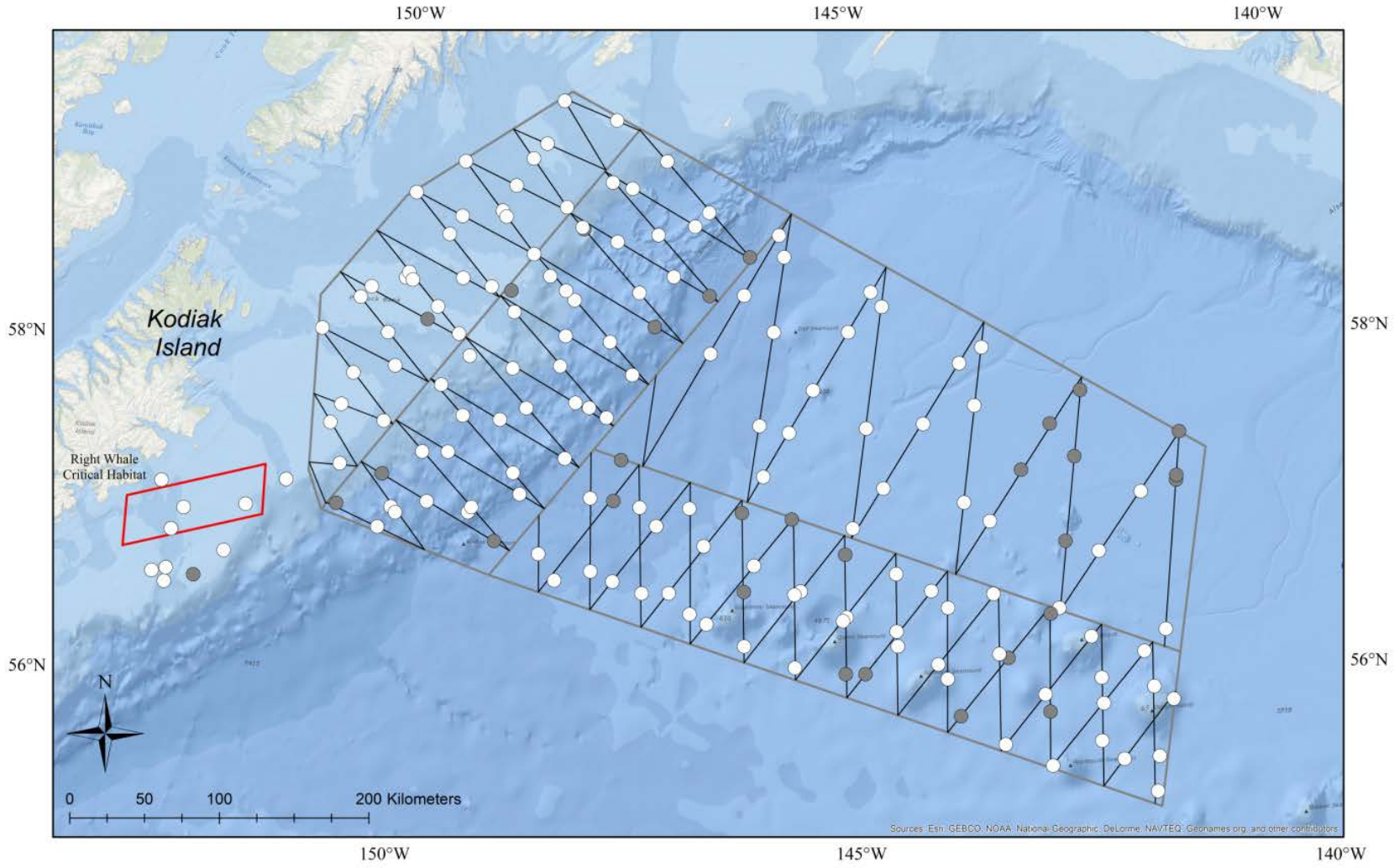


Figure 28. Successful sonobuoy deployments for the GOALS II research cruise (gray = no detection, white = detection).

Table 8. Success rate per sonobuoy type for the GOALS II research cruise (manuf. = manufacturer).

Manuf.	Type	Manuf. Year	# Deployed	# Success	Success rate (%)
SPW	77C	2005	65	62	95.4
	53F	2005	1	1	100
	53F	2011	96	89	92.7
USSI	77C	2006	6	6	100
	53F	2003	6	6	100
	53F	2004	8	6	75
	53F	2005	4	4	100
Total			**186**	**174**	**93.5**

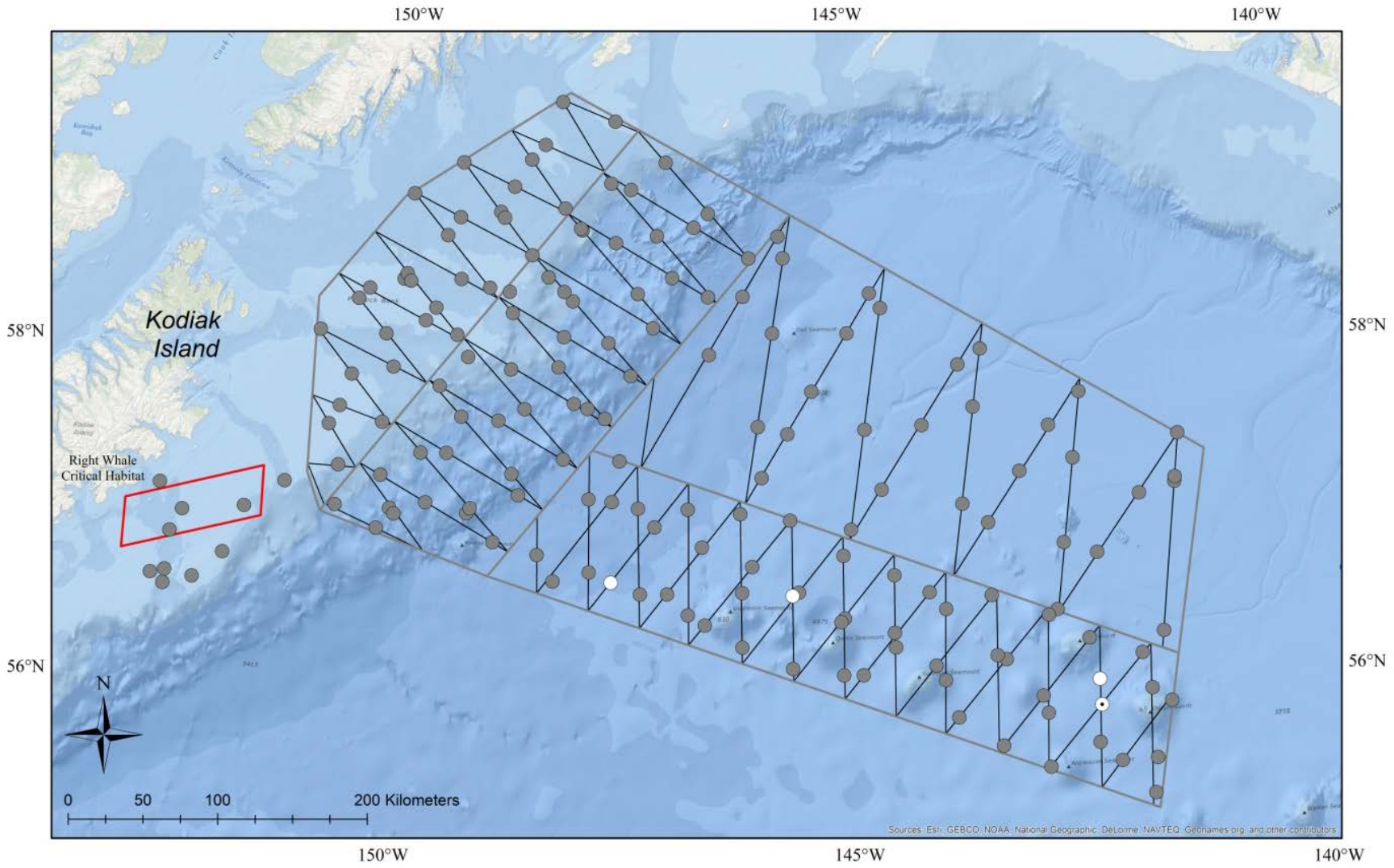


Figure 29. Sonobuoy deployments and blue whale acoustic detections on the GOALS II research cruise (gray = no detection, white with dot = possible, white = detection). Note: Detection range on blue whale calls can be far reaching. Antarctic blue whale calls were detected from hundreds of kilometers away (Miller et al. 2013).

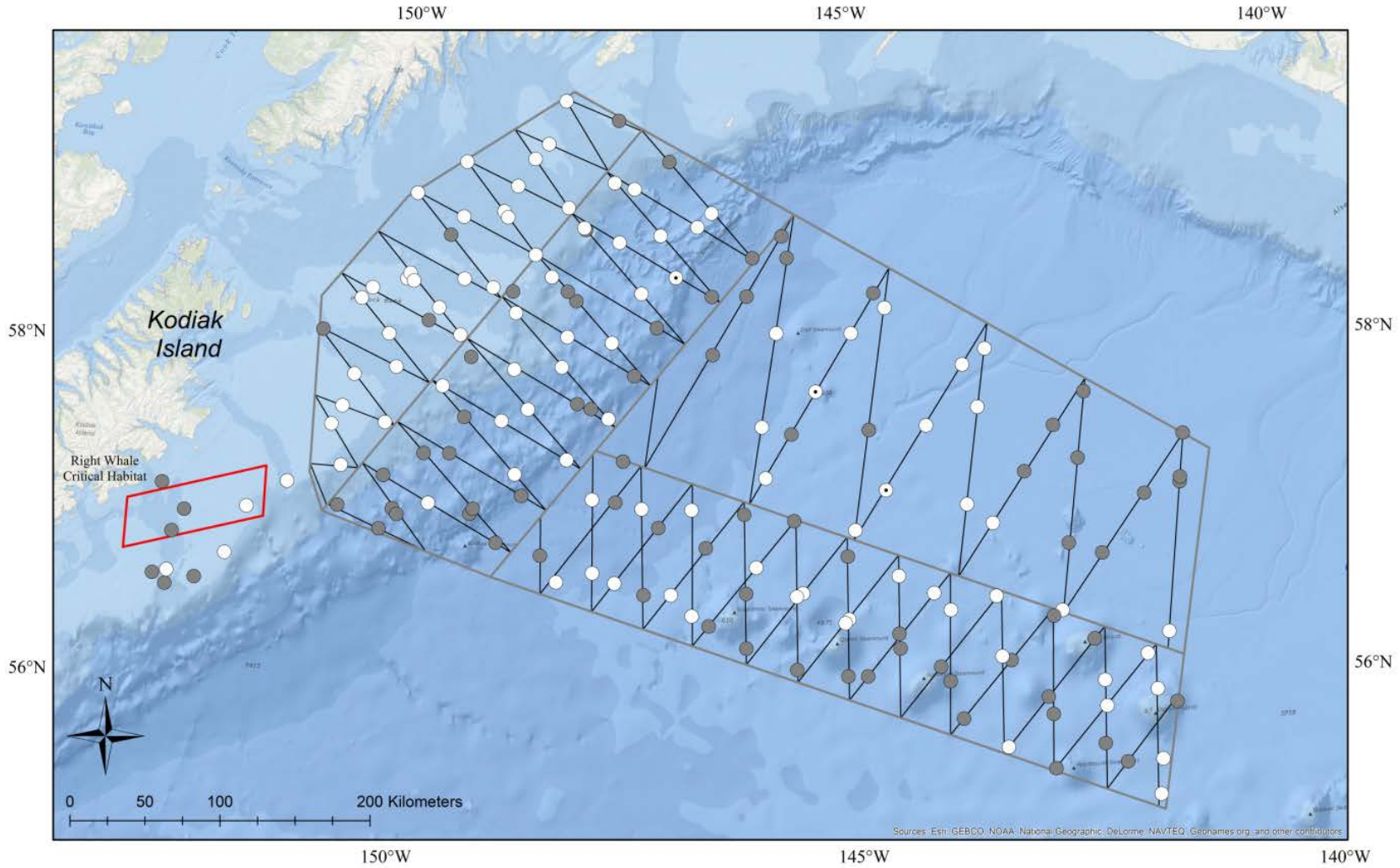


Figure 30. Sonobuoy deployments and fin whale acoustic detections on the GOALS II research cruise (gray = no detection, white with dot = possible, white = detection).

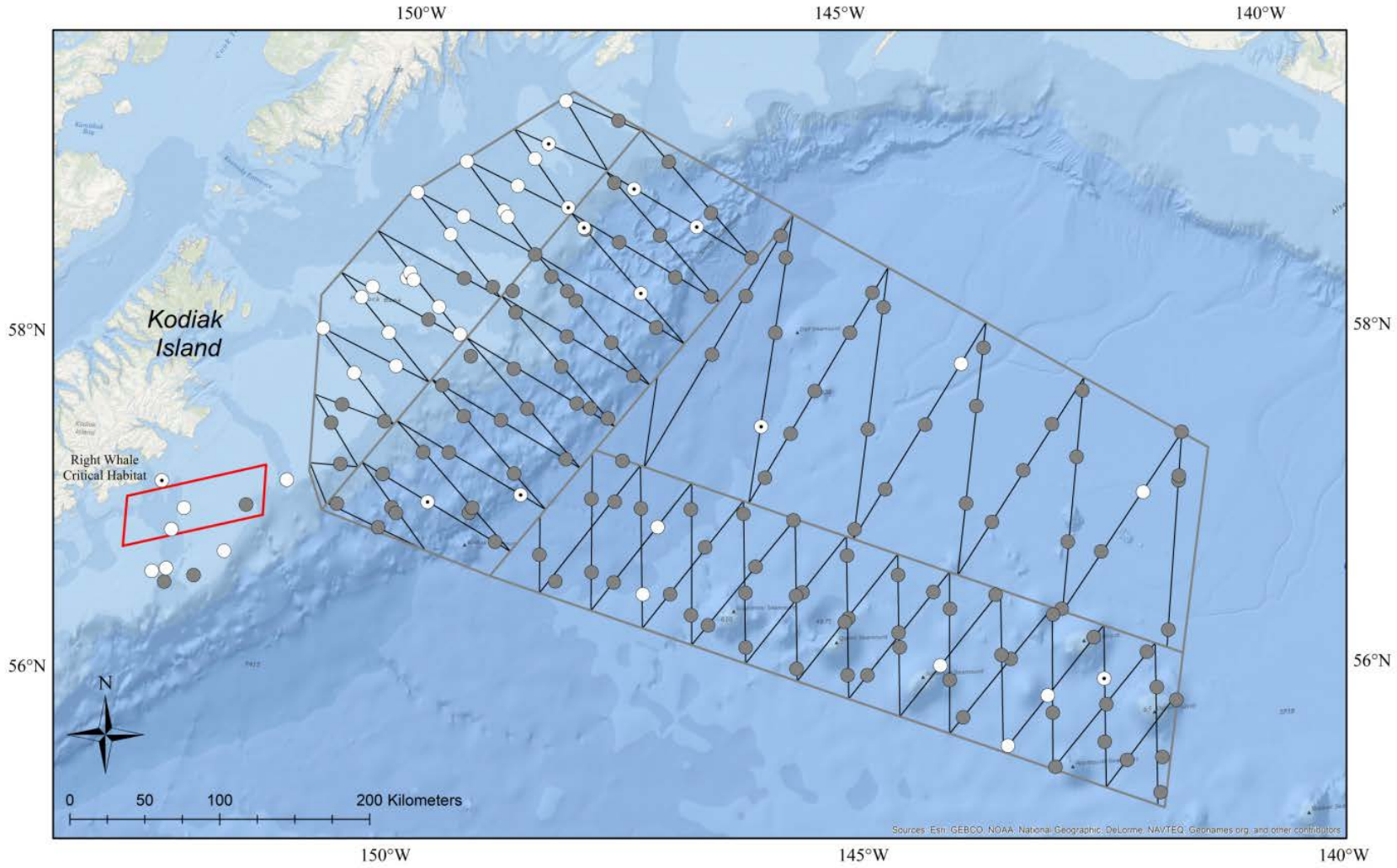


Figure 31. Sonobuoy deployments and humpback whale acoustic detections on the GOALS II research cruise (gray = no detection, white with dot = possible, white = detection).

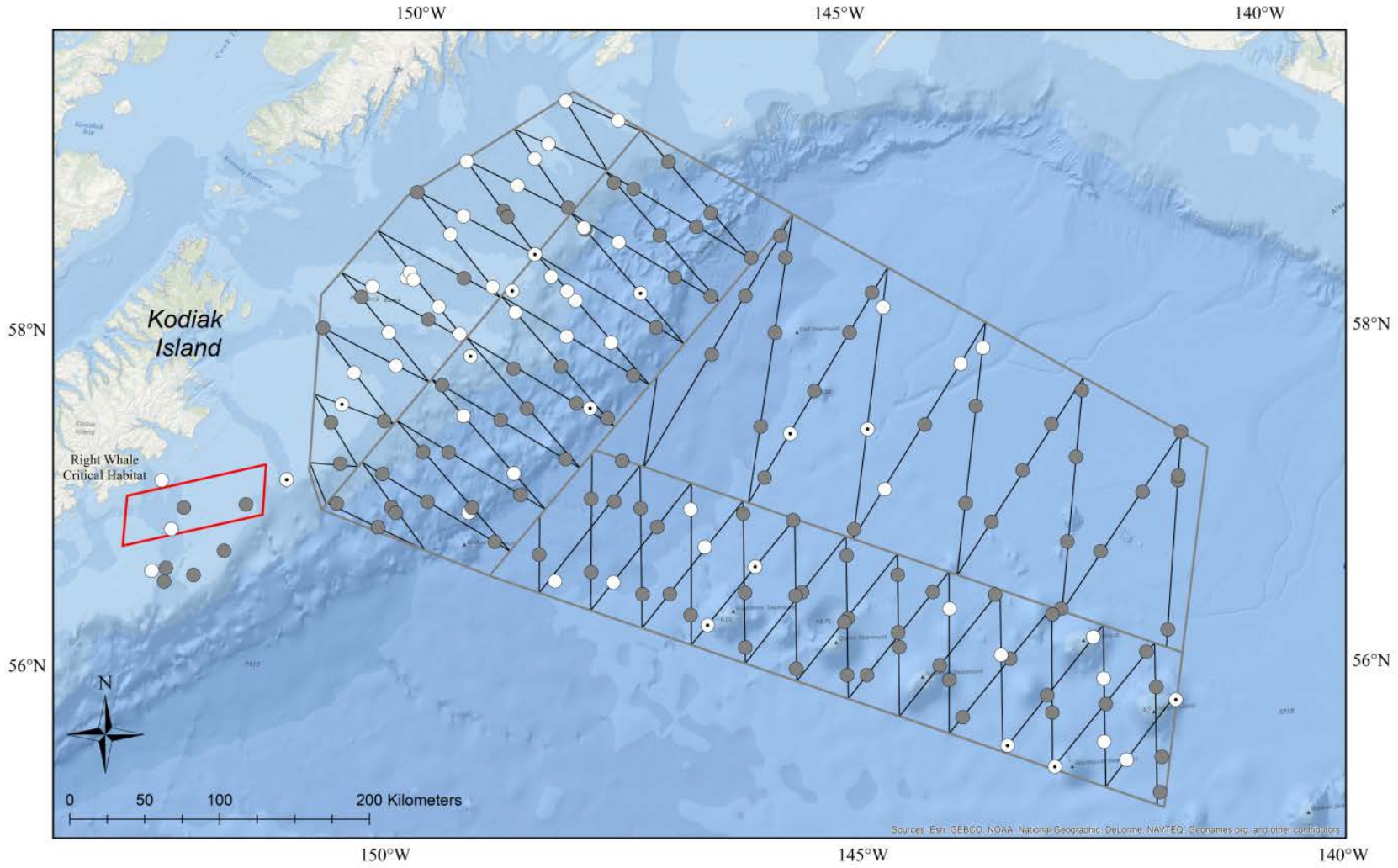


Figure 32. Sonobuoy deployments and killer whale acoustic detections on the GOALS II research cruise (gray = no detection, white with dot = possible, white = detection).

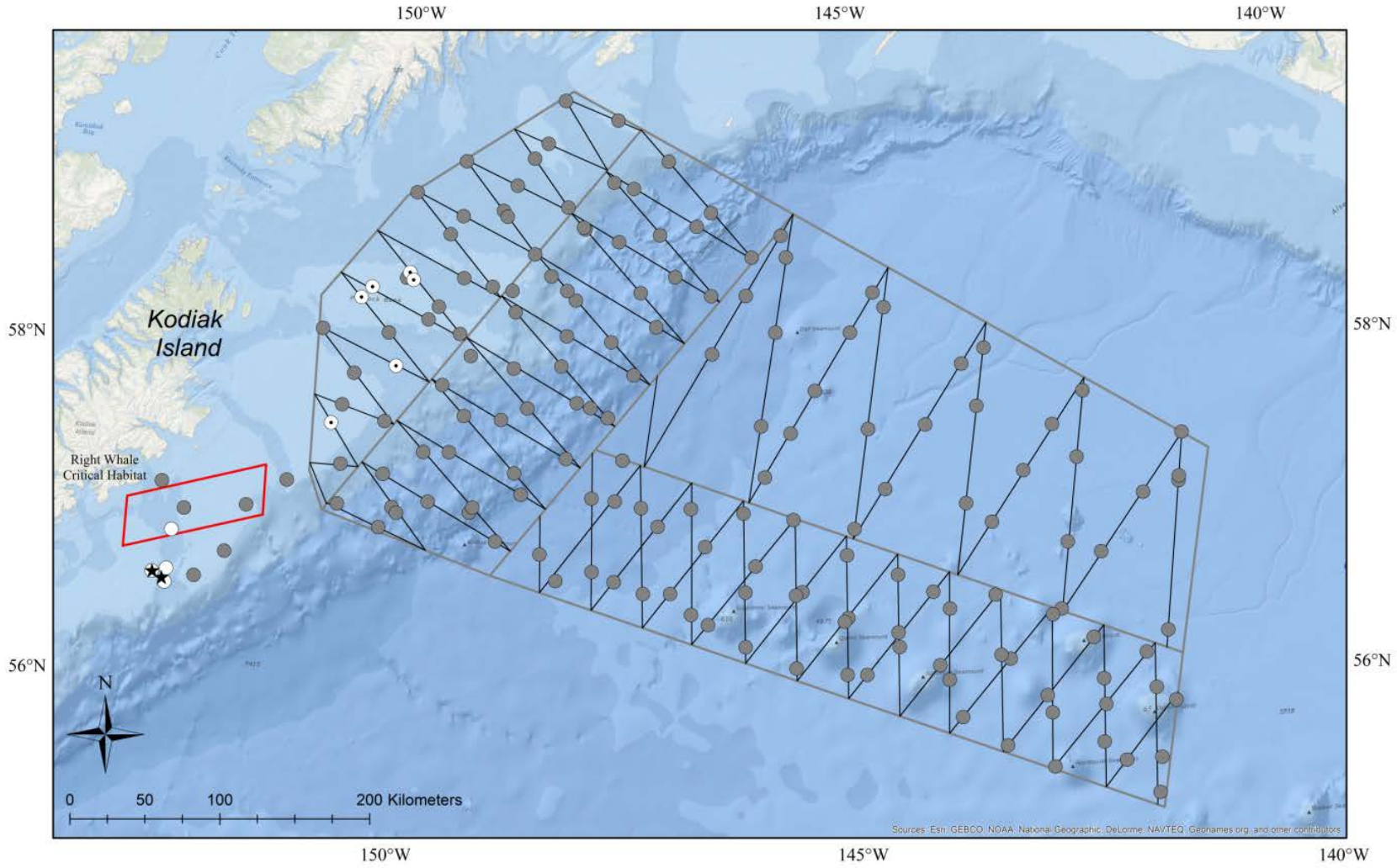


Figure 33. Sonobuoy deployments and North Pacific right whale acoustic detections on the GOALS II research cruise (gray = no detection, white with dot = possible, white = detection, star = localized).

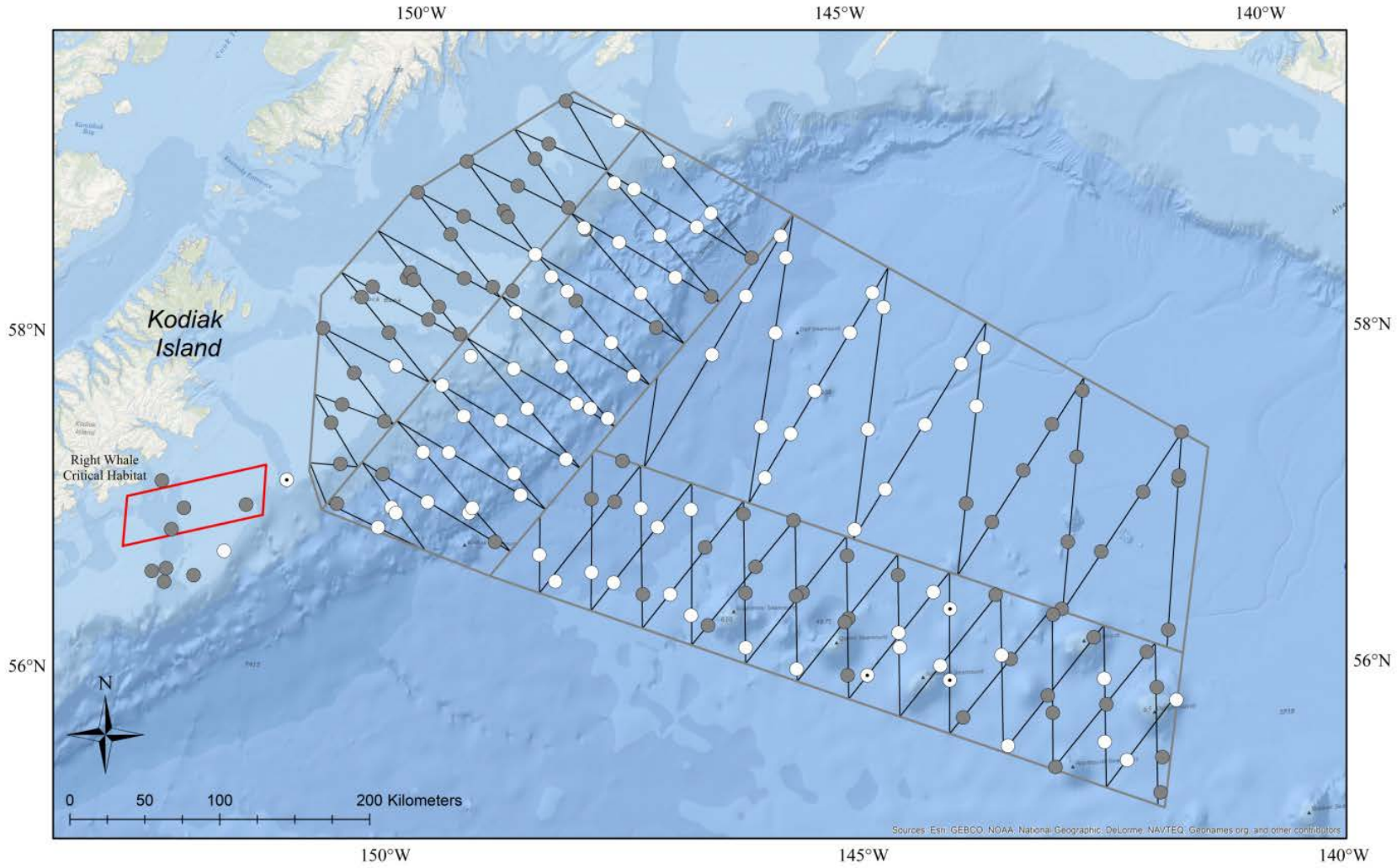


Figure 34. Sonobuoy deployments and sperm whale acoustic detections on the GOALS II research cruise (gray = no detection, white with dot = possible, white = detection).

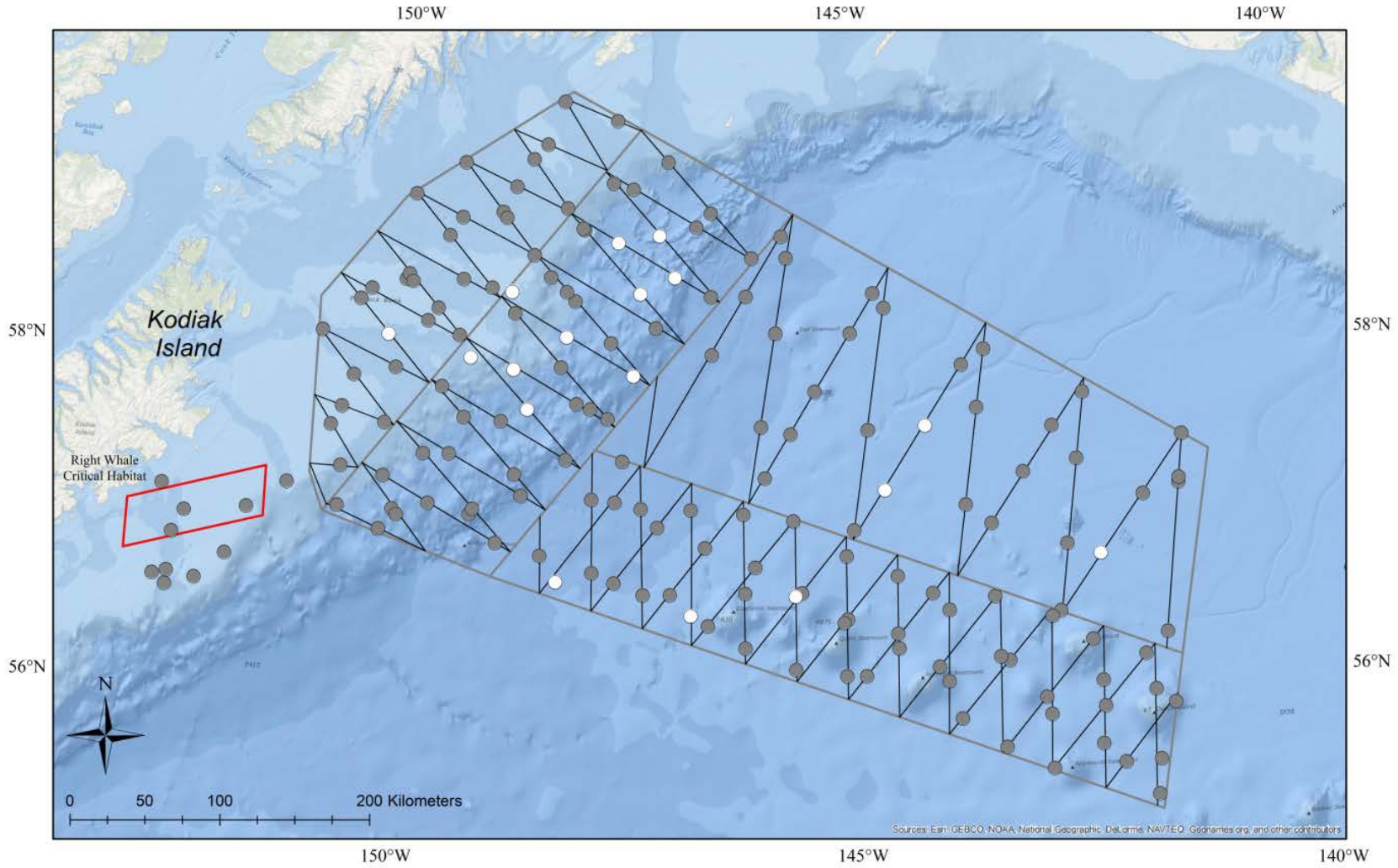


Figure 35. Sonobuoy deployments and sei whale acoustic detections on the GOALS II research cruise (gray = no detection, white = detection).

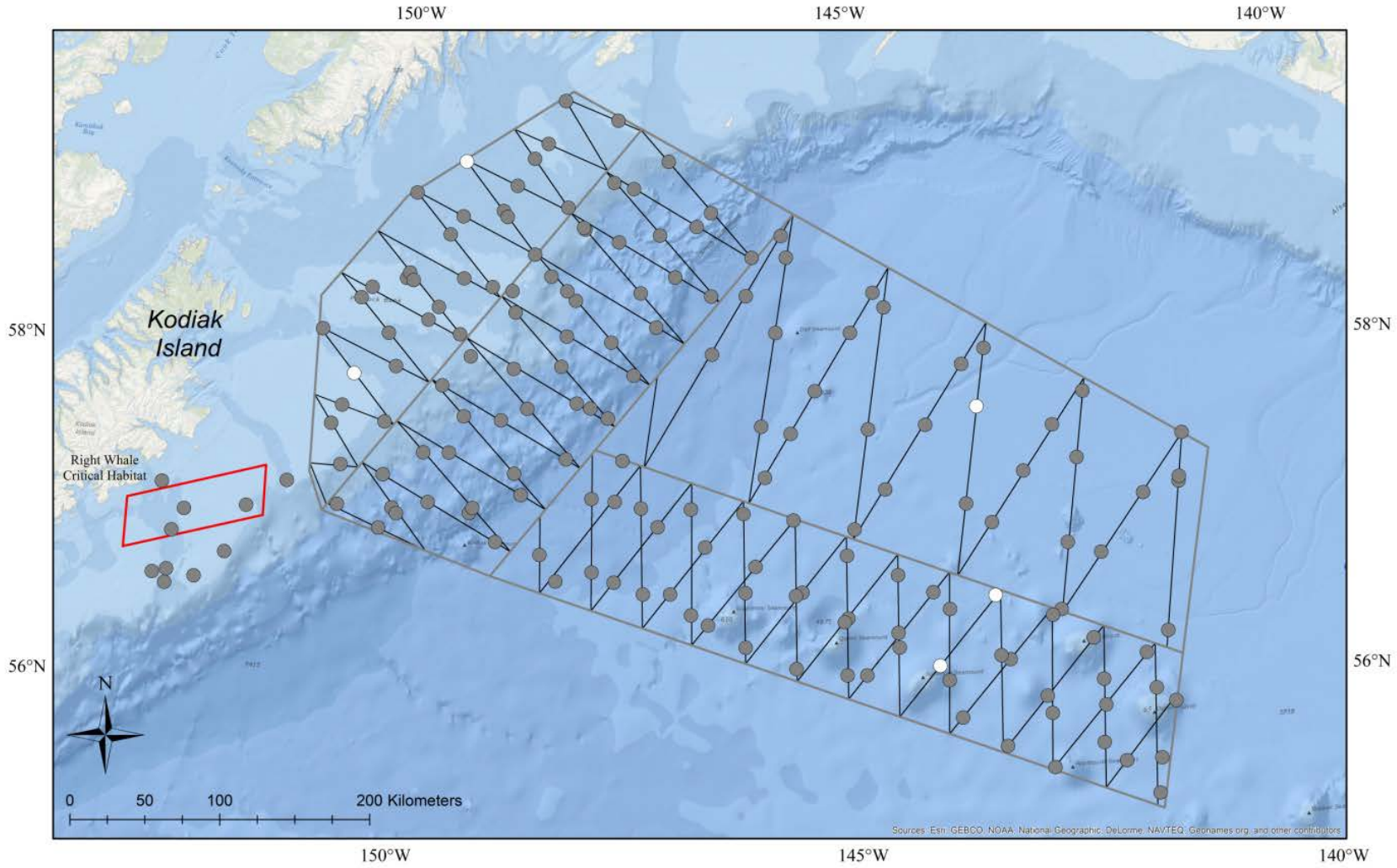


Figure 36. Sonobuoy deployments and unidentified whale acoustic detections on the GOALS II research cruise (gray = no detection, white = detection). A species confirmation cannot be determined.

Satellite Telemetry

On 29 June, two satellite tags were deployed in the seamount stratum, one on a blue whale (tag# 94818; **Figure 37**) and one on a Baird's beaked whale (tag# 98371; **Figure 38**). Both whales were tagged near the Surveyor Seamount (**Figure 39**) within 6 km of each other. The blue whale was a single adult and the tag transmitted for 9 days. During that time, the whale traveled about 250 km south of the survey area, headed west near the Patton Seamount chain, and began moving north; its final transmission was about 100 km southwest of the survey area on 9 July. Maximum distance from deployment location was 317 km on 5 July (**Figure 39**). The Baird's beaked whale was an adult in a group of four animals; there were no calves present. The tag transmitted for 15 days. During that time, the animal stayed within the seamount stratum for 9 days, spending 6 days in the vicinity of the Surveyor Seamount before heading northeast to the Pratt Seamount and then southeast to the Durgin Seamount. The animal then headed southeast until its last transmission on 15 July at its maximum distance from deployment of 482 km (located 300 km away from the survey area) (**Figure 39**).

Figure 37. Satellite transmitter tag #94818 deployed on an adult blue whale on the GOALS II research cruise, 29 June 2013.
This individual was matched to CRC2181 from the Cascadia Research Collective catalog, sighted off Baja California, Mexico, in 2005. Photo by Annie B. Douglas, Permit no. 16111.

Figure 38. Satellite transmitter tag #98371 deployed on an adult Baird's beaked whale on the GOALS II research cruise, 29 June 2013.
Photo by Annie B. Douglas, Permit no. 16111.

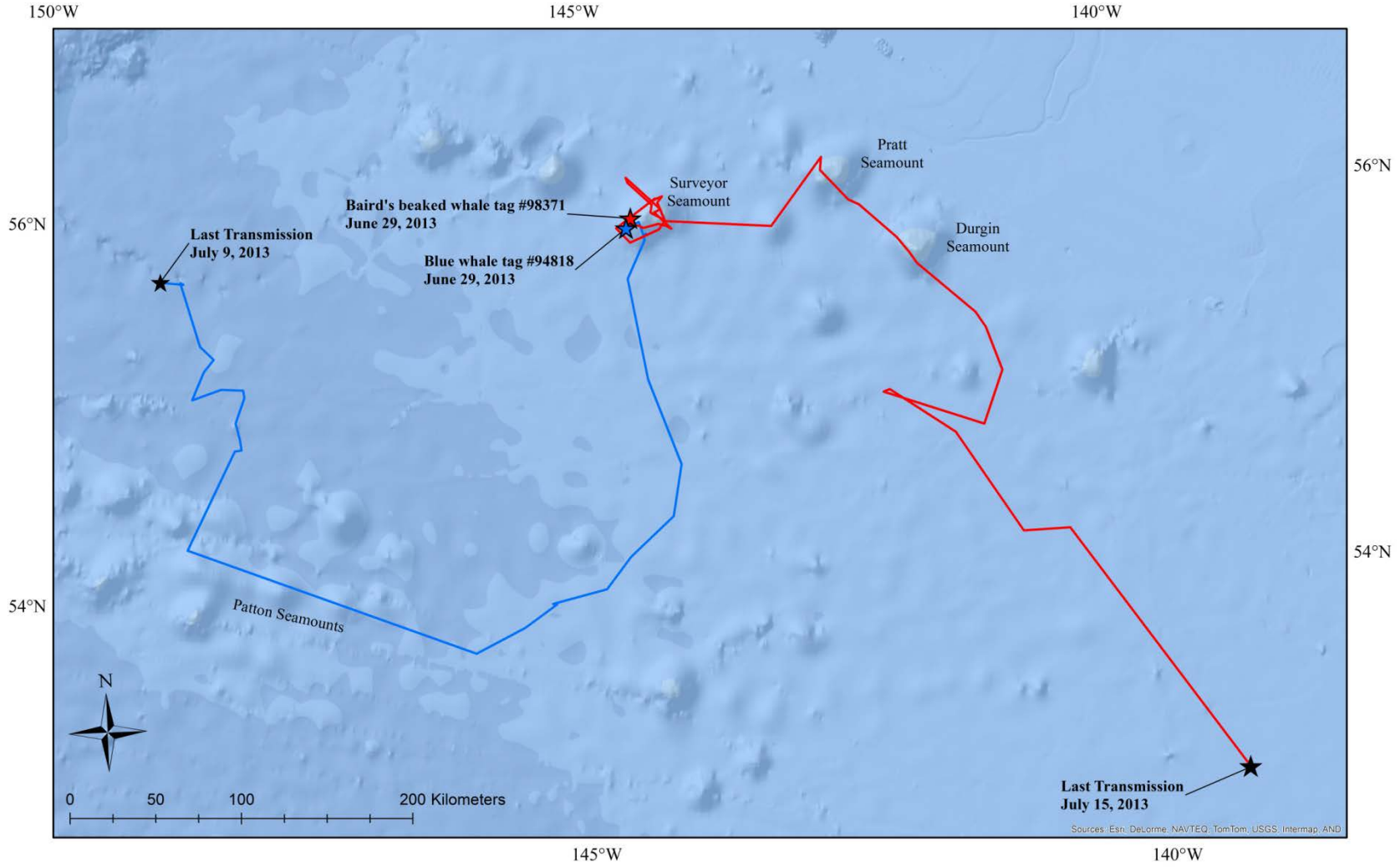


Figure 39. Satellite telemetry locations of two tagged whales during the GOALS II research cruise (blue = blue whale, red = Baird's beaked whale).

Photo-Identification

On only 11 days during the survey did the combination of survey conditions and sightings allow for close approaches for photography, with 3,951 photographs collected from 39 encounters (**Table 9; Appendix F**). Photographs of individual animals were collected from six species: blue (n = 4), fin (n = 25), humpback (n = 16), sperm (n = 1), killer (n = 19) and Baird's beaked (n = 12) whales (**Table 9; Appendix E**). The number of individuals may change once the 2013 photo analysis is complete; however, matches were made to historical catalogs for three of the five species photographed. One of the blue whales identified matched CRC ID 2181 in the catalog managed by Cascadia Research Collective. Eight humpback whales were documented in previous years. Four of the humpback whales were found in the North Pacific-wide SPLASH catalog (ID 470756, 470594, 630251, and 630480), two were found in the University of Alaska Fairbanks Gulf Apex Predator-prey Project catalog (GAP #334 and KOD11-0822-1-0189), a seventh whale (Y125) had previously been encountered in 2003 in Prince William Sound, and lastly, one individual was identified by severe propeller scars along its back. This scarred whale was photographed in the GoA during SPLASH in 2005 and again photographed during the winter of 2013 off Baja California, Mexico (Jorge Urbán, Universidad Autónoma de Baja California Sur). Currently only one killer whale has matched earlier encounters, WR702, a Western Alaska resident first encountered off Kodiak Island in 2001.

Line-transect Analysis: Visual

Estimates of detection probability for the model most supported by the AIC are presented in **Table 10** for each species or group of species. Detection functions are illustrated in **Figure 40**; the number of sightings used in the estimation of density (after truncation), estimates of encounter rate, and group sizes per stratum are summarized in **Tables 11, 12** and **13**, respectively. Estimated density and abundance of cetaceans and northern fur seals in the study area are provided in **Tables 14** and **15**, respectively. Estimates of blue, fin and humpback whale density and abundance combined with unidentified large whales pro-rated by species are provided in **Tables 16** and **17**. For species with very small sample sizes (e.g., Cuvier's beaked whale, minke whales), no abundance estimates were computed.

Dall's porpoise were the most abundant among the cetacean species seen in the area, with nearly 12,000 individuals observed. Density was greater over the shelf (in the inshore stratum), but abundance was similarly large in the inshore and slope strata, where nearly 5,000 individuals were estimated.

Fin and humpback whales were the two most abundant large whales, with both species having nearly 3,000 individuals in the study area. Density was substantially higher in the inshore stratum for both species. While humpback whale sightings in the other strata were rare, fin whales were also found offshore in relatively large numbers. Blue whales were only seen in the seamount stratum and their density was much lower if compared to other baleen whales. Sperm whales presented significantly greater densities on the slope stratum and just a few animals were observed in the seamount stratum. Killer whales were seen in all strata except the offshore stratum with greatest abundance on the slope.

Table 9. Results from photo-identified individuals collected from the GOALS II research cruise.
(Survey vessel = Aquila; Skiff = Radar; Killer whale ecotype: T = transient; R = resident; U = unknown).

Species	Date	Sighting #	Group Size	# photos	Est # individuals photographed
Baird's beaked whale	29-Jun-2013	Aquila-183	4	197	4
	08-Jul-2013	Aquila-308	15	156	5
	08-Jul-2013	Aquila-310	10	30	4
Blue whale	26 Jun-2013	Aquila-145	1	104	1
	29-Jun-2013	Aquila-185	1	104	1
	03-Jul-2013	Aquila-275	1	100	1
	04-Jul-2013	Aquila-278	1	40	1
Fin whale	25-Jun-2013	Aquila-112	2	4	0
	30-Jun-2013	Aquila-206	2	47	1
	08-Jul-2013	Aquila-309	1	84	1
	11-Jul-2013	Aquila-423	3	441	3
	15-Jul-2013	Aquila-785	13	516	11
	16-Jul-2013	Aquila-836	3	7	1
	16-Jul-2013	Aquila-851	6	319	6
	16-Jul-2013	Radar-3	5	11	1
Humpback whale	16-Jul-2013	Aquila-810	6	8	1
	16-Jul-2013	Aquila-833	7	31	4
	16-Jul-2013	Aquila-837	4	7	1
	16-Jul-2013	Aquila-838	8	4	1
	16-Jul-2013	Aquila-843	4	15	2
	16-Jul-2013	Aquila-854	1	22	1
	16-Jul-2013	Radar-2	2	5	1
	16-Jul-2013	Aquila-859	1	239	1
	16-Jul-2013	Radar-4	1	6	1
	16-Jul-2013	Aquila-864a	4	174	2
Killer whale					
T	03-Jul-2013	Aquila-272	7	605	6
R	09-Jul-2013	Aquila-337	55	395	6
R		Aquila-341	4	2	1
U	11-Jul-2013	Aquila-415	6	3	0
R	16-Jul-2013	Aquila-885	5	147	2
T		Aquila-931	5	122	4
Sperm whale	11-Jul-2013	Aquila-408	1	6	1

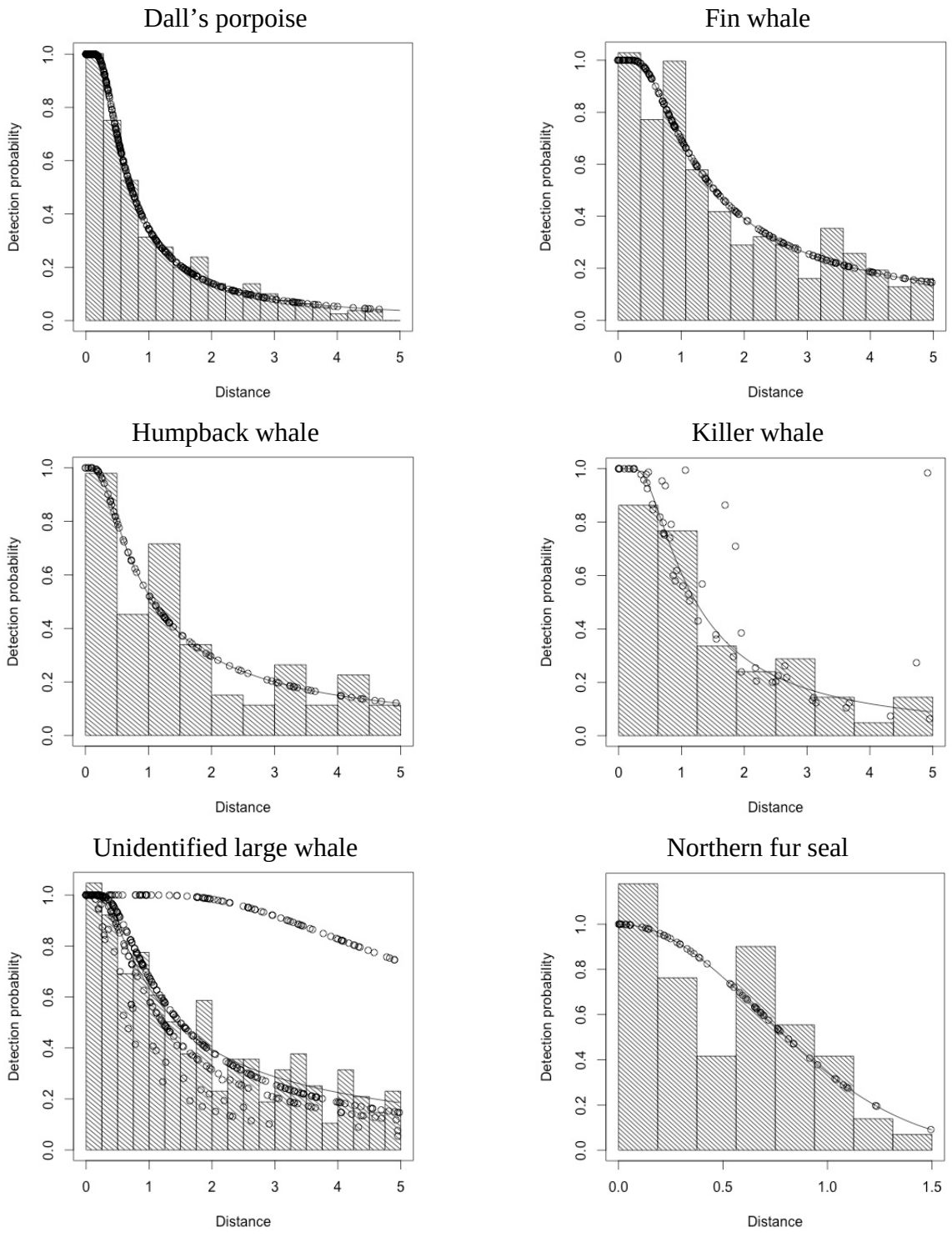


Figure 40. Detection functions for various species or group of species for which abundance estimates were computed during GOALS II.
The line in the graphs corresponds to the average detection probability at a given distance (km) from the trackline and the dots correspond to the detection probability of each individual sighting.

Table 10. Detection probability estimates (P) with coefficient of variation (CV) for the most supported model during GOALS II.

Species	Model	*P*	CV(*P*)
Dall's porpoise	Hazard rate	0.23	0.10
Fin whale	Hazard rate	0.42	0.14
Humpback whale	Hazard rate	0.35	0.23
Killer whale	Hazard rate + group size	0.35	0.22
Large whales	Hazard rate + species	0.43	0.11
Northern fur seal	Half normal	0.55	0.11

Table 11. Number of sightings (after truncation) used in the estimation of density and abundance for GOALS II.

	Stratum				
Species	**Inshore**	**Offshore**	**Seamount**	**Slope**	**Total**
Blue whale			4		4
Dall's porpoise	148	26	20	98	292
Fin whale	76	36	11	47	170
Humpback whale	78	3	3	1	85
Killer whale	3		2	14	19
Sperm whale			1	18	19
Unid. large whale	37	26	19	21	103
Northern fur seal	15	25	12	7	59

Table 12. Estimates of encounter rate (groups/km) and CV (in parenthesis) for species for which abundance estimates were computed during GOALS II.

	Stratum				
Species	**Inshore**	**Offshore**	**Seamount**	**Slope**	**Total**
Blue whale			0.005 (0.47)		0.001 (0.47)
Dall's porpoise	0.220 (0.51)	0.028 (0.50)	0.016 (0.38)	0.077 (0.40)	0.070 (0.28)
Fin whale	0.113 (0.41)	0.039 (0.22)	0.009 (0.34)	0.037 (0.15)	0.041 (0.19)
Humpback whale	0.116 (0.57)	0.003 (0.73)	0.002 (0.54)	0.001 (1.00)	0.020 (0.51)
Killer whale	0.005 (0.55)		0.002 (0.74)	0.011 (0.93)	0.005 (0.74)
Sperm whale			0.001 (1.00)	0.014 (0.39)	0.004 (0.44)
Unid. large whale	0.038 (0.34)	0.021 (0.24)	0.011 (0.44)	0.016 (0.25)	0.019 (0.15)
Northern fur seal	0.022 (0.28)	0.027 (0.32)	0.009 (0.29)	0.005 (0.39)	0.014 (0.18)

Table 13. Estimates of average group size (individuals/group) and CV (in parenthesis) for species for which abundance estimates were computed during GOALS II.

Species	Stratum				Total
	Inshore	Offshore	Seamount	Slope	
Blue whale			1.50 (0.17)		1.50 (0.17)
Dall's porpoise	2.21 (0.11)	2.23 (0.12)	1.55 (0.08)	3.94 (0.27)	2.64 (0.12)
Fin whale	2.57 (0.21)	1.97 (0.10)	1.72 (0.07)	1.36 (0.06)	2.06 (0.12)
Humpback whale	3.73 (0.18)	1.00 (0.00)	1.33 (0.21)	1.00 (0.00)	3.43 (0.21)
Killer whale	3.63 (0.21)		4.90 (0.30)	6.11 (0.18)	5.50 (0.18)
Sperm whale			2.00 (0.00)	1.17 (0.05)	1.22 (0.08)
Unid. large whale	1.42 (0.16)	1.37 (0.08)	1.36 (0.08)	1.05 (0.05)	1.32 (0.06)
Northern fur seal	1.13 (0.08)	1.04 (0.03)	1.00 (0.00)	1.29 (0.15)	1.07 (0.03)

Table 14. Estimates of density (individuals/km^2) and CV (in parenthesis) for selected species observed during GOALS II. Estimates were not corrected for the proportion of animals missed on the trackline.

Species	Stratum				Total
	Inshore	Offshore	Seamount	Slope	
Blue whale			0.0013 (1.22)		0.0004 (1.22)
Dall's porpoise[1]	0.214 (0.50)	0.028 (0.52)	0.011 (0.41)	0.133 (0.36)	0.072 (0.28)
Fin whale	0.068 (0.49)	0.018 (0.27)	0.003 (0.39)	0.012 (0.21)	0.020 (0.28)
Humpback whale	0.125 (0.74)	0.001 (0.77)	0.001 (0.64)	0.000 (1.03)	0.018 (0.71)
Killer whale	0.005 (0.60)		0.002 (0.77)	0.020 (1.93)	0.006 (0.73)
Sperm whale			0.001 (1.09)	0.007 (0.58)	0.002 (0.57)
Unid. large whale	0.006 (0.42)	0.003 (0.29)	0.002 (0.49)	0.002 (0.27)	0.003 (0.22)
Northern fur seal	0.015 (0.28)	0.017 (0.35)	0.006 (0.31)	0.004 (0.39)	0.011 (0.23)

[1] Dall's porpoise estimates assume no responsive movement occurred prior to detection, an assumption often violated as this species tends to approach the vessel for bow-riding.

Table 15. Estimates of abundance (individuals) and CV (in parenthesis) for selected species observed during GOALS II. Estimates were not corrected for the proportion of animals missed on the trackline.

Species	Stratum				Total
	Inshore	Offshore	Seamount	Slope	
Blue whale			60 (1.22)		60 (1.22)
Dall's porpoise	4873 (0.50)	1658 (0.52)	486 (0.41)	4907 (0.36)	11924 (0.28)
Fin whale	1552 (0.49)	1084 (0.27)	159 (0.39)	433 (0.21)	3228 (0.28)
Humpback whale	2837 (0.74)	56 (0.77)	41 (0.64)	8 (1.03)	2942 (0.71)
Killer whale	117 (0.60)		107 (0.77)	726 (1.93)	950 (0.73)
Sperm whale			31 (1.09)	265 (0.58)	296 (0.57)
Unid. large whale	140 (0.42)	188 (0.29)	75 (0.49)	67 (0.27)	470 (0.22)
Northern fur seal	345 (0.28)	1013 (0.35)	256 (0.31)	156 (0.39)	1770 (0.22)

[1] Dall's porpoise estimates assume no responsive movement occurred prior to detection, an assumption often violated as this species tends to approach the vessel for bow-riding. Violation of this assumption will lead to overestimation of abundance.

Table 16. Estimates of density (individuals/km^2) and CV (in parenthesis) for blue, fin and humpback whales after pro-rating the abundance of unidentified large whales. Estimates were not corrected for the proportion of animals missed on the trackline.

Species	Stratum				Total
	Inshore	Offshore	Seamount	Slope	
Blue whale			0.002 (1.22)		
Fin whale	0.071 (0.49)	0.021 (0.27)	0.005 (0.39)	0.014 (0.21)	0.022 (0.28)
Humpback whale	0.129 (0.74)	0.001 (0.76)	0.001 (0.64)	0.000 (1.03)	0.019 (0.71)

Table 17. Estimates of abundance (individuals) and CV (in parenthesis) for blue, fin and humpback whales after pro-rating the abundance of unidentified large whales. Estimates were not corrected for the proportion of animals missed on the trackline.

Species	Stratum				Total
	Inshore	Offshore	Seamount	Slope	
Blue whale			78 (1.22)		78 (1.22)
Fin whale	1610 (0.49)	1265 (0.27)	207 (0.39)	499 (0.21)	3581 (0.28)
Humpback whale	2927(0.74)	65 (0.76)	53 (0.64)	9 (1.03)	3054 (0.71)

Line-transect Analysis for Sperm Whales: Towed-Hydrophone Array

A total of 174 sperm whale encounters with localizations of quality scores of 1–4 was used in the acoustic line-transect density and abundance estimation analysis. Sample size for the offshore (n = 28) and the seamount (n = 17) strata were deemed too small to fit a detection function by stratum; a global detection function was estimated. Encounter rates and densities were estimated for each stratum, and global density was estimated as the mean of the stratum estimates weighted by stratum area. The model that best fit the distance data was the hazard rate + hermite model, with right-truncation of data at 20 km and four equal group (i.e., bin) intervals (**Table 18**). The resulting detection functions for the best-fit models are shown in **Figure 41**. Based on this detection function, the estimated strip half-width was 9.93 km.

Encounter rates (animals/km surveyed) were estimated separately for each stratum (**Table 19)**. The resulting encounter rate estimates were 0.025 for the offshore stratum, 0.0072 for the seamount stratum and 0.065 for the slope stratum.

The resulting abundance estimates by stratum were 78 (CV = 0.36) for the offshore stratum, 16 (CV = 0.55) for the seamount stratum, and 121 (CV = 0.18) for the slope stratum. When all strata were combined (i.e., the pooled estimate), the abundance was estimated at 215 (CV = 0.18) (**Table 19**). This equates to a density estimate of 0.0013 animals per km^2, or 1.3 animals per 1,000 km^2. Estimates were not corrected for the proportion of animals missed on the trackline (see Discussion - Analysis Caveats).

Table 18. Distance sampling density estimation model comparison.
The model with the lowest AIC and therefore, the best fit for the data (bold) was used for density and abundance estimates (No. par = number of parameters; AIC = Akaike Information Criterion; CV = coefficient of variation).

Data Type	Truncation	Model	No. par	AIC	CV
Ungrouped	N	Half-normal + cosine	3	926.7	0.194
		Hazard-rate +hermite	3	918.3	0.163
Grouped (4 equal intervals)	**Y**	**Hazard-rate +hermite**	**2**	**349.4***	**0.171**
		Uniform + hermite	3	354.6	0.199
		Half-normal +hermite	2	353.5	0.208
Grouped (6 equal intervals)	N	Uniform + cosine	3	371.4	0.162
		Uniform + hermite	3	371.4	0.162
		Hazard-rate +cosine	2	364.4*	0.169
		Hazard-rate +hermite	2	364.4*	0.168
		Half-normal + cosine	1	371.9	0.165
		Half-normal + hermite	1	371.9	0.165
		Half-normal + polynomial	1	371.9	0.165
Grouped (7 equal intervals)	N	Hazard-rate + hermite	2	414.2	0.163
		Half-normal + hermite	1	424.3	0.164
		Uniform + hermite	1	560.9	0.158
Grouped (8 equal intervals)	N	Hazard-rate + hermite	2	472.2	0.164
		Half-normal + hermite	1	481.6	0.164
		Uniform + hermite	1	531.8	0.169

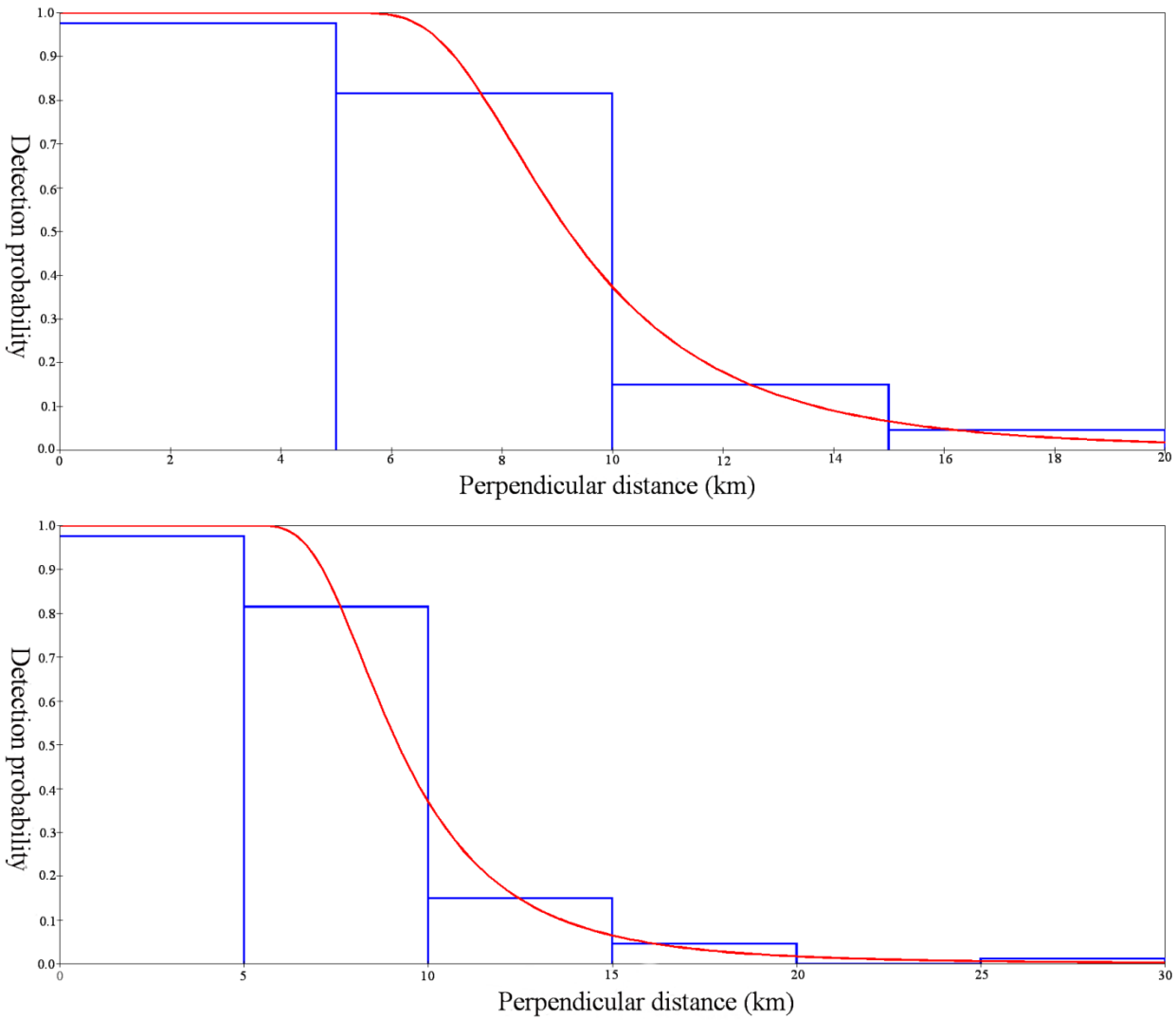


Figure 41. Hazard-rate + hermite model detection functions for right-truncated (top) and non-truncated (bottom) models.

Table 19. Sperm whale localizations (n), encounter rate (ER, individuals/km), density (D, ind/km^2), and abundance (N), with CVs in parentheses, using GOALS II acoustic detections from a towed-hydrophone array.
Estimates were not corrected for the proportion of animals missed on the trackline.

Stratum					
Parameter	**Inshore**	**Offshore**	**Seamount**	**Slope**	**Total**
n		28	17	129	174
ER		0.026(0.35)	0.007(0.54)	0.066(0.17)	
D		0.001(0.36)	0.000(0.55)	0.003(0.18)	0.001(0.18)
N		78(0.36)	16(0.55)	121(0.18)	215(0.18)

DISCUSSION

The implementation of a multi-disciplinary approach to data collection proved to be an invaluable strategy for this project. Given the expansive geographic area and variation in habitat within the GoA TMAA, along with the typical weather challenges for this region, the combination of visual and PAM methods was paramount in providing comprehensive monitoring and improved understanding of marine mammals in the study area. Of the 13 species identified, 8 were detected by both visual and acoustic platforms (Baird's and Cuvier's beaked whales, Dall's porpoise, blue, fin, humpback, killer, and sperm whales), 3 were confirmed by visual only (harbor porpoise, gray, and minke whale), and 2 were confirmed by acoustics only (Stejneger's beaked whale and sei whale). Knowledge was further strengthened by successful tag deployments and photo-identification.

Results from this survey contribute to baseline data collected during the GOALS I survey in 2009 (Rone et al. 2010). It's important to note the differences and similarities between the surveys. Visual survey methodology and 24-hr/day acoustic monitoring by a towed-hydrophone array were the same for both surveys. The two surveys were conducted during different seasons: spring (April 2009) for GOALS I versus summer (June/July 2013) for GOALS II. There was a significant difference in survey effort: 11 days in 2009 and 26 days in 2013. The survey design was changed in 2013: 2 strata and 22 tracklines in 2009 and 4 strata and 72 tracklines in 2013. This occurred for two reasons: (1) increased survey days in 2013 allowed additional search effort and (2) additional strata were identified to increase probability of beaked whale detections (addition of slope and seamount strata). Sonobuoys were not available during the 2009 survey resulting in the absence of acoustic information on the occurrence of calling baleen whales.

Analysis Caveats

Visual

Visual estimates of abundance presented in this study assumed that no cetaceans were missed on the trackline (g[0]=1). Failure to meet this assumption (referred to as 'visibility bias') is common in marine mammal surveys and causes negative biases in density estimates (Laake 1999; Buckland et al. 2001). Marsh and Sinclair (1989) coined the terms "perception" and "availability" bias to differentiate two forms of visibility bias. Perception bias occurs when marine mammal groups are available to be seen but are missed by the observers while availability bias corresponds to animals that are missed because they are submerged. Except for long-diving species such as sperm whales and beaked whales and for species that are only seen at close ranges such as harbor porpoise, the latter is typically not as an important issue as perception bias in ship surveys (see discussion in Barlow 1995); animals are often at the surface and within the visual range of observer due to the relatively slow speed of the vessel. The magnitude of visibility bias is possibly small in the estimates of large whales with visible bodies and conspicuous blows such as blue, fin, and humpback whales. Studies to assess the proportion of whales missed on the trackline have shown that nearly 90–100 percent of humpback and blue whales are detected during ship surveys, depending on visibility conditions and group size (Barlow and Gerrodette 1996; Calambokidis and Barlow 2004). On the other hand, visibility bias is more substantial for species that are more difficult to detect (e.g., Dall's porpoise) or for deep-diving species (e.g., sperm whales) leading to more severe negative bias in their estimates. The

magnitude of the bias is unknown in this study; surveys with two independent observer teams would allow for experiments to estimate g(0) and should therefore be considered in future surveys.

In this study, no attempts were made to correct for responsive movements of Dall's porpoise. This species tends to show a positive response to surface survey platforms (i.e., approach the vessel for bow-riding). Typically, detection occurs after the group responds to the presence of the boat (is moving towards it) or when it is at the bow, violating one of the basic assumptions of the line-transect theory. Positive responsive movements will cause overestimation of abundance to a degree difficult to estimate given the sampling methods used in this study. Future surveys could conduct experiments (e.g., Palka and Hammond 2002) to assess the proportion of animals approaching the vessel and therefore apply correction factors to estimate abundance of Dall's porpoise more accurately.

Small sample sizes typically result in large uncertainty around the estimates. Estimates were calculated for blue, sperm, and killer whales despite their small numbers of visual detections (e.g., see **Table 11**) in order to provide a baseline for predictions on presence. The effects of the small sample sizes are reflected in the relatively high CVs for these species.

Killer whale estimates from this survey are not stratified by ecotype. Studies have shown all three ecotypes are genetically distinct in both mtDNA and nuclear DNA (Hoelzel and Dover 1991; Hoelzel et al. 1998, 2002; Barrett-Lennard 2000). As such, stocks are partitioned into ecotypes and regions within ecotypes and managed separately (Allen and Angliss 2013). Sightings of transient and resident ecotypes were confirmed through photo-identification and the presence of the offshore ecotype by acoustics. However, because only 6 out of 21 killer whale sightings were identified to ecotype, the proportion of each ecotype cannot be inferred from the data collected on GOALS II.

Finally, estimates of unidentified large whales were only allocated to species for which estimates were computed from the data (i.e. from species sighted). There is a possibility that some of the whales designated as unidentified correspond to species not detected, but because no confirmed sightings exist in the GOALS II data, allocation to other species is not feasible.

Acoustics: towed-hydrophone array

Acoustic sperm whale estimates also assumed no animals were missed on the trackline (i.e., g[0]=1), and that all animals present were vocalizing frequently enough to be within detection range along the trackline. It is important to note that this is an estimate of acoustically active (i.e., vocalizing) animals in the study area. Because animals are not vocalizing 100 percent of the time, g(0) may not be equal to one. Therefore, this acoustic-based estimate could be an underestimate of the true density. However, unless sperm whales are vocally inactive for long periods of time in the survey area then chances are good that they will be picked up acoustically along the survey trackline (within the limits of the system).

The number of acoustic localizations with perpendicular distances near the trackline was lower than expected (**Figure 9**). This pattern of decreased localizations near the trackline is also evident in histograms of perpendicular distances of acoustic localizations in other studies of sperm whales (Figure 7C in Barlow and Taylor 2005; Figures 5, 6 in Lewis et al. 2007). There

are four possible explanations for this type of pattern: (1) a decrease (or cessation) in sperm whale vocalization rates when the survey vessel is nearby, (2) movements of sperm whales away from the survey vessel (i.e., negative responsive movements), (3) measurement error due to the a violation of the assumption that animals are located on the same horizontal plane as the towed-hydrophone array, and (4) a negative bias in the chance of localizing animals near the trackline relative to distances further away from the trackline.

The first two explanations are possible and could significantly cause an underestimation in abundance; however, there is no evidence indicating that this is a major concern. Various studies indicate that sperm whales rarely cease vocalizing for periods long enough to be missed by acoustic detection methods (Whitehead and Weilgart 1990; Douglas et al. 2005; Watwood et al. 2006). In some cases, sperm whales have been documented to cease vocalizations when disturbed by intense or disruptive sounds (such as Navy sonar or seismic survey air guns) (Watkins et al. 1985; Miller et al. 2009). Other studies observed only brief interruption in vocalization patterns or no reactions to vessels and/or low-intensity sonar (Watkins et al. 1993). A land-based study did not find alterations in the visible surface behaviors of sperm whales (Magalhaes et al. 2002), but did not examine their acoustic behaviors. Our experience from monitoring sperm whales from towed arrays for several hundred hours is that there are no obvious changes in sperm whale vocalization rates when the vessel is nearby. However, if a significant number of animals near the trackline ceased vocalizing for extended periods (i.e., > 1 hour), this could result in a decrease in detections near the trackline; these animals would be missed or could not be localized on due to few bearings.

Measurement error can occur with deep-diving sperm whales near the trackline. This would result in a slant distance measurement instead of horizontal distance. This violates the assumption for line-transect analysis that all animals localized are located on a horizontal plane; perpendicular distances would be over-estimated, resulting in a longer effective strip width and an underestimation of abundance. Sperm whales in cold/temperate waters have been documented to regularly dive to depths of several hundred to 1,600 m while foraging (Wahlberg 2002). Animals in the central GoA are believed to be primarily foraging so they would be expected to engage in deep-diving behaviors. Measurement error would be limited to sperm whales localized within the first few km perpendicular to the trackline. At greater distances (e.g., over 4–5 km) the vertical component of the slant range would be small relative to the horizontal component, and therefore, would not result in a large error in the perpendicular distance estimates. The resulting bias in abundance would be expected to be small. Grouping of the perpendicular distance data prior to analysis (as was done herein) would minimize any bias associated with measurement.

A negative bias in localization ability near the trackline is likely occurring to some degree. Most hydrophones have a limited ability to ‘look’ directly forward or backwards. This is due to physical properties of the acoustic sensitivity of hydrophones relative to the spatial orientation of the towed array. For most towed-hydrophone array designs used for monitoring marine mammals, reliable bearing estimation is limited to greater than approximately 10–20 degrees forward and aft of the axis of the array (Rankin 2008). However, the region monitored by a hydrophone array is actually three dimensional (as opposed to the two-dimensional surface being monitored by visual observers). If the depth to which animals regularly dive were similar to the ranges at which they were heard (tens of km in the case of sperm whales), there would be no bias in the region being monitored. Because foraging sperm whales are limited to dive depths of no

more than approximately 1,600 m, this effectively reduces the region (i.e., volume of water) that is being surveyed along the trackline relative to the volume being monitored out to the sides of the trackline. This, in turn, reduces the amount of time animals can be heard as the vessel passes. Perpendicular distance data collected during this and other studies indicate that sperm whales can be detected as far as 20 km (slant-ranges) away. This suggests that the horizontal component of the slant ranges is much greater than the vertical component. As long as animals do not stop vocalizing for a period that is longer than the period being monitored when the vessel passes overhead, there is no reason to believe they will be missed. However, even minor negative responses to the survey vessel (i.e., movement away) would result in significantly fewer detections along the trackline because animals can only be detected for a relatively short period of time directly along the trackline.

It is difficult to determine which of these possibilities have the greatest effect on the abundance estimates because they all potentially contribute to a bias. Regardless, there was a noticeable reduction in localizations near the trackline due to either measurement error or responsive movements to the vessel, or some combination of these two possibilities. To remedy this, Buckland et al. (2001) recommends grouping into larger bin intervals prior to analysis. This approach was used for data in our analysis, and the results indicate that this effectively handled these issues (**Figure 41**).

Acoustics: DiFAR sonobuoys

The purpose of using sonobuoys was to document the presence of vocalizing marine mammals, specifically targeting low-frequency baleen whales that would go undetected by the towed-hydrophone array. Localizations of calling whales were not obtained (except for North Pacific right whales). This would have required deployment of additional sonobuoys in order to calculate cross-bearings, which did not fit within the scope of this survey. Sonobuoys were used solely for assessing presence/absence of calling animals. Generally, acoustic detection ranges for baleen whales average around 20 km but can vary from 5 to 100 km (McDonald 2004); however this is species and call-type dependent. For example, North Pacific right whale up-calls are detected on average between 19 and 30 km (McDonald and Moore 2002). However, vocalizing Antarctic blue whales were acoustically tracked from hundreds of km away (Miller et al. 2013). Variation in detection range can be attributed to a number of factors including topography, sea conditions, and frequency in call type. Therefore, calling animals may be located outside the survey area or within a different stratum from the sonobuoy deployment.

Blue whales

Blue whales were the fourth most common large whale sighted (n = 5) with a few acoustic detections on sonobuoys (n = 3); all detections were within the seamount stratum. Blue whales were not detected visually during 2009, and there was no capability to detect them acoustically. In the North Pacific, blue whales produce two distinct call types suggesting two distinct populations, eastern and western, with geographic overlap in the GoA (Stafford et al. 2001; Stafford 2003). Although once abundant throughout the North Pacific, they are rarely sighted in the GoA as a result of commercial whaling. Since the 1970s, there have been large aggregations of blue whales documented off California and Baja California and in the eastern tropical Pacific (Wade and Friedrichsen 1979; Calambokidis et al. 1990; Barlow 1994; Calambokidis and Barlow 2004; Reilly and Thayer 1990); it has been unclear if these animals were part of the

Alaskan population (Rice 1974; 1992). Based on photo-identification analysis, Calambokidis et al. (2009) suggest that animals at least in the eastern GoA are likely part of the same population that is found off California during the summer months. Four blue whales were photo-identified and compared to the photo-identification catalog maintained by Cascadia Research Collective. The satellite-tagged whale matched CRC2181, an animal sighted off Baja in 2005. This provides additional evidence that some of the blue whales found in the southern waters off California and Mexico utilize the GoA as a summer feeding ground. Calambokidis et al. (2009) suggests the eastern North Pacific blue whales may be returning to a pre-whaling migration pattern. The tag deployed on this survey represents the first tagged blue whale in this region. Although the tag transmitted for a short duration (9 days), this animal provided invaluable insight into the habitat use in the central GoA; this animal traveled 750 km during this time within deep water and around seamounts.

There has been scant recent information on blue whale distribution and no abundance estimates available within Alaskan waters. During a survey in 2012, four blue whales were documented on a transect located south of the GoA TMAA (Figure 2a in Matsuoka et al. 2013). The GOALS II estimates (N = 78, D = 0.0005, CV = 1.22) represent the first blue whale estimates for the central GoA.

Beaked whales

Little is known about beaked whale distribution and abundance in the GoA due to the lack of survey effort complicated by their often cryptic surface behaviors. This survey was designed to dedicate effort on the continental slope and near the seamounts, areas recognized as primary habitat for beaked whales (Ohsumi 1983; Kasuya and Ohsumi 1984; Kasuya 2002). Beaked whales were detected both acoustically by the towed-hydrophone array (n = 49) and visually (n = 13); no beaked whales were sighted in 2009. Baird's beaked whales were a majority of the visual sightings (n = 7). This is likely because they are relatively large, have a visible blow at the surface, and often travel in large groups (58 individuals were encountered). In contrast, Cuvier's beaked whales were the most frequent acoustically detected beaked whale (n = 34) with only one confirmed visual sighting. This is not surprising given their relatively small size; they are often sighted in small groups or as individuals (Jefferson et al. 2008). Stejneger's beaked whales were only detected acoustically. There were five visual sightings of unidentified beaked whales. Two of these sightings were possible Stejneger's based on the description and sketches from the visual observer. However, no photos were collected and neither encounter was sighted by a second observer for confirmation, so those sightings must remain unidentified.

As expected, beaked whales were associated with seamounts and the slope. Additionally, they were documented throughout the offshore stratum **(Figures 11** and **25**). Tag data from the Baird's beaked whale was the first documentation of fine-scale habitat use within this region. This individual demonstrated the importance of seamount habitat, remaining approximately 9 days, presumably foraging, within a relatively small geographic range inside the GoA TMAA; approximately 6 of those days were spent within the region of a single seamount (**Figure 39**). Results from a recent study of beaked whale habitat association in the California Current Ecosystem indicate that small beaked whales are strongly associated with north-west facing slopes. Depth, slope aspect, and distance from the 2,000-m isobath were identified as important variables associated with beaked whale presence (Yack 2013). This may also be the case in the GOALS II study area, but would require additional analysis to determine. Cephalopods are an

important part of the beaked whale diet (MacLeod 2005; MacLeod et al. 2006). It has been suggested that cephalopod species may be associated with seamounts and other steeply sloping ocean features because they are carried onto slopes by oceanic currents (Nesis 1993). Prey availability is likely a driving factor in determining beaked whale associations with habitat features in the study area. Further study will be needed to elucidate these predator-prey-habitat relationships.

Fin whales

Fin whales were the most common large cetacean sighted (n = 200 sightings) and acoustically detected from sonobuoys (n = 92 sonobuoys). Likewise, fin whales were the most frequently sighted (n = 24) in 2009 (Rone et al. 2010). There are no current abundance estimates for the entire GoA, and although abundance and density estimates were generated for fin whales in 2009, results from 2013 provide the most extensive information to date within this region. Surveys conducted between June and August in 1980 within the GoA only resulted in a survey total of 33 individuals sighted. The study concluded that all great whales were severely depleted in the GoA (Rice and Wolman 1982). In recent years, Zerbini et al. (2006) estimated fin whale abundance along the Aleutian Islands and the Alaska Peninsula in the early 2000's at 1,652 (CV = 0.19) with a 4.8 percent (95 percent CI = 4.1–5.4 percent) increase annually. In 2009, spring abundance within the GoA TMAA was estimated at 1,604 (CV = 0.36, including apportioned unidentified large whales) (Rone et al. 2010). With a GOALS II estimate of 3,581 (CV = 0.28, including apportioned unidentified large whales), there was twice the number of animals estimated from 2009.

Given that the point estimates in fin whale abundance from GOALS I and II are not significantly different, the point estimates could be explained by differences in seasons, weather and effort. It is also important to note that in the five year gap between the two GOALS surveys, some population increase is expected for this recovering baleen whale (e.g. Zerbini et al. 2006; Moore and Barlow 2011).

Much of what is known about fin whale distribution in recent years is derived from acoustic studies. Stafford et al. (2007) demonstrated that fin whales were present year-round in the GoA. There were seasonal peaks in call rates in fall and winter with fewer calls recorded during summer months. It was proposed that fewer calls during summer months may be explained by a collective movement inshore out of range of the hydrophones as well as an absence in long series of pulses (Stafford et al. 2007). Historically, fin whales were present throughout the GoA in large numbers (Mizroch et al. 2009). Results from this survey confirm a substantial presence of fin whales throughout inshore and offshore waters during summer months.

Humpback whales

Humpback whales were the second most common large whale sighted (n = 106) and fourth for sonobuoy detections (n = 32). Aside from a few sparse sightings in pelagic waters of the offshore and seamount strata, humpbacks were mainly sighted within the inshore stratum. This is comparable to the spring distribution from 2009 (see Figure 4 in Rone et al. 2010). The main aggregations in both years, spring and summer, were located in the same general area to the east of Kodiak Island (**Figure 17**). This coincides with findings from previous line-transect surveys in this area that described typical water depths for humpback whales as between 50 and 200 m

(Brueggeman et al. 1988). Lower densities occurred within the slope, offshore, and seamount strata indicating these areas are not likely preferred habitat and are likely used only during migration and perhaps not during the feeding season.

Of the 16 distinct individual humpback whales photographed (including the whale with the heavily scarred dorsal fin), 6 whales had been previously sighted during the summer months off Kodiak Island, Alaska, and 1 in Prince William Sound, Alaska. Additionally, two different calving/breeding regions were represented with one whale previously encountered off Molokai, Hawai'i, and another (the scarred individual) off Baja California in 2013.

Surveys conducted between June and August in 1980 within the GoA resulted in a survey total of 191 individuals sighted (Rice and Wolman 1982). Zerbini et al. (2006) estimated humpback whale abundance along the Aleutian Islands and the Alaska Peninsula in the early 2000s at 2,644 (CV = 0.17) with a 6.6 percent (95 percent CI = 5.2–8.6 percent) increase annually. The 2009 GOALS I survey estimated spring abundance at 328 (CV = 0.40) compared to 3,054 (CV = 0.71) in 2013. The point estimates in humpback abundance for GOALS I and II are statistically different based on non-overlapping confidence intervals (GOALS I: 95 percent CI = 154–697; GOALS II: 95 percent CI = 873–10,683). Although differences in weather and effort likely contribute to the markedly higher estimates in 2013, seasonality plays a critical role in humpback presence on the feeding ground. Whereas animals sighted in April 2009 were either a portion of the individuals present year-round within the GoA (Straley 1990) or early arrivals from low-latitude winter grounds, the animals sighted during June/July of this survey occurred during the height of summer foraging for this migratory baleen whale. Additionally, numbers were expected to increase since 2009 for this recovering species (e.g. Zerbini et al. 2006). The overall North Pacific humpback whale population continues to grow with the most recent estimate of approximately 21,000, which is greater than some prior estimates of pre-whaling abundance (Barlow et al. 2011).

Killer whales

Killer whales were sighted visually (n = 21) and acoustically detected on both sonobuoys (n = 46) and the towed-hydrophone array (n = 35) in 2013. Killer whales were both sighted (n = 6) and acoustically detected (n = 16) in 2009 (see Figures 5; 8 in Rone et al. 2010); distribution within the shelf, slope, and pelagic waters in both years were similar. Killer whales occur year-round in Alaskan waters (Braham and Dahlheim 1982). It is important to note that all three ecotypes (transient, resident, and offshore) occur within the GoA. Although an abundance estimate of 950 individuals (CV = 0.73) from GOALS II represents the first estimate for killer whales within the central GoA, this estimate does not consider ecotype. Both transient and resident ecotypes were photographed during this survey and three acoustic detections were classified as the offshore ecotype.

North Pacific right whales

North Pacific right whales were not encountered visually but were acoustically detected with sonobuoys. There were several distant impulsive gunshot-like sounds detected on sonobuoys deployed within the inshore stratum (**Figure 33**). While gunshot calls are a common call-type of North Pacific right whales (Rone et al. 2012) other broadband impulsive sounds, such as breaching events, flipper slaps, or mechanical noise can produce similar sounds. The main

aggregation of humpback whales was within detection range of these sonobuoys (**Figure 17**); surface-active behavior could be a possible source of these sounds. Bearings to detection were directed behind the vessel, indicating the vessel was not the source of the noise. Sonobuoys were detecting other species vocalizing in the area, none of which were confirmed visually. These gunshot-like sounds were distant and infrequent; given multiple possible sources they cannot be attributed definitively to a North Pacific right whale.

On the transit back to Kodiak, Alaska, a survey was conducted within Barnabus Trough, on Albatross Bank, which runs up the western half of the designated Critical Habitat (**Figure 33**). North Pacific right whales are rarely sighted in the GoA (Waite et al. 2003; Mellinger et al. 2004b; Wade et al. 2011); and any new information is invaluable. Two individual right whales were positively identified acoustically and localized at the mouth of Barnabus Trough, southwest of the GoA TMAA **(Figure 33**) using sonobuoys (as per Rone et al. 2012). Unfortunately, conditions were poor (Beaufort sea state 7; visibility < 1 km) and the animals were never sighted. Approximately 30 km north of the two animals, a newly deployed sonobuoy detected a loud, clear gunshot call. Detection range for sonobuoys is typically around 19–30 km (McDonald and Moore 2002; Rone et al. 2012). The vessel diverted to deploy an additional sonobuoy to obtain a crossfix but the animal never called again. Despite the inability to obtain a crossfix, this was considered a third individual based on detection range, the intensity of the gunshot, and the bearing to the call. Detailed records from Soviet whaling catches in 1963 and 1984 show that right whales were distributed across deep waters of the GoA (Ivashchenko and Clapham 2012), consistent with their 19th century range (Townsend 1935). Although a majority of sightings in recent years have occurred on Albatross Bank, it is important to note that right whales can occur elsewhere. In 2012, a right whale was sighted in pelagic waters, just south of the GoA TMAA (Matsuoka et al. 2013), habitat historically used by right whales (Clapham et al. 2004).

Sei whales

Although sei whales were acoustically detected, there were no visual confirmations. Out of the 17 sonobuoys with sei whale calls (**Figure 35**), only 4 sonobuoys detected calls where unidentified whales were visually observed. In all four situations, there were numbers of unidentified large or sei/fin whales documented. It is possible for sei whales to be confused with fin whales, and therefore, species-specific physical characteristics must be observed for positive identification. Observers were conservative in their classifications and used either a fin/sei or simply an unidentified large whale classification. It is also important to note that several of the sei whale calls were distant and therefore, the animals were possibly located beyond the limits of the viewing area. In 2012, sei whales were sighted within the GoA during an International Whaling Commission survey although all sightings were south of the GoA TMAA (Matsuoka et al. 2013). Historically, they were targeted during commercial whaling, although exact numbers of catches were unclear as they were over-reported to mask takes of illegal species (Ivanshchenko and Clapham 2013). There are no current abundance estimates for sei whales within Alaskan waters.

Sperm whales

Sperm whales were the most frequently encountered species on the towed-hydrophone array (n = 241 detections), third most sighted large whale (n = 19), and second most detected species from sonobuoys (n = 81). Sperm whales were not sighted during the 2009 survey but were the

most frequently encountered (n = 28) species on the towed-hydrophone array during that survey. A lower number of acoustic encounters and lack of sightings in 2009 can be attributed to differences in seasons, inclement weather (for visual), and lower survey effort. In 2009, there were a few encounters in shallow waters within the inshore stratum (see Figure 8 in Rone et al. 2010) but encounters were located farther offshore along the shelf break and beyond in 2013.

Sperm whales are widely distributed throughout the North Pacific; they are present year-round within the GoA with higher presence during summer months (Mellinger et al. 2004a). Historically it was believed that only adult male sperm whales migrated to the high latitudes of Alaskan waters (Mizroch and Rice 2013); however, Mizroch and Rice (2013) demonstrated movements of females into the GoA from catch records. Recently, Fearnbach et al. (2012) documented a rare winter sighting of approximately 50 individuals comprised of female and immature males near the Aleutian Islands, confirming that present-day movements are not confined to the tropics and sub-tropics. Although an abundance estimate for the entire GoA is not available, visual surveys by the NMML conducted between 2001 and 2006 found sperm whales to be the most frequently sighted large cetacean (NMML, unpublished data in Allen and Angliss 2013).

In tropical/sub-tropical geographic regions, group sizes are typically large consisting of nursery or bachelor groups often diving asynchronously. This compounded with long dive times complicates group size estimation and requires an observation period before obtaining a final estimate (e.g., Barlow and Taylor 2005). There was not sufficient time during the GOALS II survey to conduct a similar observation period for each sperm whale sighting. It is possible that both sexes and a mixture of age classes can be found in Alaskan waters; however, it is not as likely that large groups would be encountered in the GoA. The oldest males are generally solitary, and it is this sex/age class that is generally encountered at the highest latitudes (Mizroch and Rice 2013). The average group size estimated for this survey was 1.22 individuals.

Porpoise

The most visually documented cetacean was Dall's porpoise (n = 337), with a few acoustic detections from the towed-hydrophone array confirmed by visual sightings (n = 3). Higher agreement between visual and acoustics would not have been expected. The inshore stratum was the only part of the survey where the sample rates were configured to detect porpoise clicks. Within the inshore stratum, there is overlap in distribution between harbor and Dall's porpoise (Allen and Angliss 2013). Given the similarities in clicks between the two species, the acoustic sampling took a conservative approach and only provided species determination when it was linked with a visual confirmation. Linking a visual sighting to clicks was most likely impeded by reactive movements toward the vessel and the uncertainty in individual sightings within areas of high concentrations. Dall's porpoise are found in continental shelf, slope, and pelagic waters with seasonality in movements (Hall 1979). Although sighted throughout the survey area, there were two substantial concentrations of porpoise within the inshore and slope strata that accounted for a significant portion (55 percent) of the sightings (**Figure 13**). Additionally, there were two small clusters of harbor porpoise on the shelf (**Figure 16**) consistent with their known shallow-water preference (e.g., Hobbs and Waite 2010).

CONCLUSIONS

Results from this survey provide one of the most comprehensive data sets on marine mammal occurrence and distribution within the central GoA. Visual and acoustic detections were sufficient to calculate density and abundance estimates for six cetacean and one pinniped species. New information on movements and habitat use within the GoA were documented through the first satellite tag deployments on blue and Baird's beaked whales within this region. Photographic data contributed to knowledge on seasonal presence of identified individuals within a study area rarely surveyed. Overall, GOALS II provided valuable new data on marine mammals in the GoA.

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APPENDIX A

Table of Waypoints and Trackline Distance

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APPENDIX A
Table of Waypoints and Trackline Distance

Key:
LADD = Latitude in decimal degrees; LODD = Longitude in decimal degrees; WP = waypoint; L = length

Stratum	LADD	LODD	WP	LADD	LODD	WP	Transect	L(Km)
offshore	56.17	-141.68	1	57.45	-141.33	2	1-2	144
offshore	57.45	-141.33	2	56.43	-142.78	3	2-3	143
offshore	56.43	-142.78	3	57.82	-142.38	4	3-4	156
offshore	57.82	-142.38	4	56.68	-143.89	5	4-5	156
offshore	56.68	-143.89	5	58.18	-143.44	6	5-6	169
offshore	58.18	-143.44	6	56.92	-145.02	7	6-7	169
offshore	56.92	-145.02	7	58.54	-144.53	8	7-8	182
offshore	58.54	-144.53	8	57.15	-146.16	9	8-9	182
offshore	57.15	-146.16	9	58.87	-145.60	10	9-10	195
offshore	58.87	-145.60	10	57.37	-147.31	11	10-11	195
offshore	57.37	-147.31	11	57.91	-147.17	12	11-12	61
seamount2	57.45	-147.89	13	56.50	-147.88	14	13-14	105
seamount2	56.50	-147.88	14	57.27	-146.79	15	14-15	108
seamount2	57.27	-146.79	15	56.30	-146.79	16	15-16	108
seamount2	56.30	-146.79	16	57.05	-145.65	17	16-17	109
seamount2	57.05	-145.65	17	56.08	-145.66	18	17-18	108
seamount2	56.08	-145.66	18	56.82	-144.54	19	18-19	108
seamount2	56.82	-144.54	19	55.85	-144.58	20	19-20	108
seamount2	55.85	-144.58	20	56.58	-143.44	21	20-21	107
seamount2	56.58	-143.44	21	55.61	-143.49	22	21-22	108
seamount2	55.61	-143.49	22	56.33	-142.34	23	22-23	108
seamount2	56.33	-142.34	23	55.36	-142.43	24	23-24	108
seamount2	55.36	-142.43	24	55.90	-141.60	25	24-25	79
seamount1	55.24	-141.91	26	56.20	-141.81	27	26-27	108
seamount1	56.20	-141.81	27	55.49	-142.98	28	27-28	108
seamount1	55.49	-142.98	28	56.46	-142.89	29	28-29	107
seamount1	56.46	-142.89	29	55.73	-144.05	30	29-30	108
seamount1	55.73	-144.05	30	56.70	-143.98	31	30-31	108
seamount1	56.70	-143.98	31	55.96	-145.12	32	31-32	108
seamount1	55.96	-145.12	32	56.94	-145.09	33	32-33	108
seamount1	56.94	-145.09	33	56.19	-146.21	34	33-34	108
seamount1	56.19	-146.21	34	57.16	-146.22	35	34-35	108
seamount1	57.16	-146.22	35	56.40	-147.32	36	35-36	108
seamount1	56.40	-147.32	36	57.37	-147.36	37	36-37	108

Stratum	LADD	LODD	WP	LADD	LODD	WP	Transect	L(Km)
seamount1	57.37	-147.36	37	56.60	-148.44	38	37-38	108
seamount1	56.60	-148.44	38	57.06	-148.46	39	38-39	51
slope	57.09	-150.80	40	56.84	-149.70	41	40-41	73
slope	56.84	-149.70	41	57.35	-150.44	42	41-42	72
slope	57.35	-150.44	42	56.85	-148.77	43	42-43	115
slope	56.85	-148.77	43	57.61	-150.08	44	43-44	115
slope	57.61	-150.08	44	57.10	-148.40	45	44-45	115
slope	57.10	-148.40	45	57.86	-149.71	46	45-46	115
slope	57.86	-149.71	46	57.35	-148.02	47	46-47	115
slope	57.35	-148.02	47	58.12	-149.33	48	47-48	115
slope	58.12	-149.33	48	57.61	-147.64	49	48-49	115
slope	57.61	-147.64	49	58.38	-148.95	50	49-50	115
slope	58.38	-148.95	50	57.86	-147.25	51	50-51	115
slope	57.86	-147.25	51	58.63	-148.56	52	51-52	115
slope	58.63	-148.56	52	58.11	-146.86	53	52-53	115
slope	58.11	-146.86	53	58.88	-148.17	54	53-54	115
slope	58.88	-148.17	54	58.35	-146.46	55	54-55	115
slope	58.35	-146.46	55	59.13	-147.77	56	55-56	115
slope	59.13	-147.77	56	58.60	-146.06	57	56-57	115
slope	58.60	-146.06	57	59.39	-147.37	58	57-58	115
inshore	59.38	-147.37	59	59.57	-148.28	60	59-60	55
inshore	59.57	-148.28	60	59.14	-147.76	61	60-61	56
inshore	59.14	-147.76	61	59.38	-148.85	62	61-62	68
inshore	59.38	-148.85	62	58.89	-148.16	63	62-63	67
inshore	58.89	-148.16	63	59.19	-149.41	64	63-64	79
inshore	59.19	-149.41	64	58.63	-148.56	65	64-65	79
inshore	58.63	-148.56	65	58.99	-149.97	66	65-66	90
inshore	58.99	-149.97	66	58.37	-148.96	67	66-67	90
inshore	58.37	-148.96	67	58.74	-150.40	68	67-68	93
inshore	58.74	-150.40	68	58.11	-149.35	69	68-69	93
inshore	58.11	-149.35	69	58.48	-150.79	70	69-70	94
inshore	58.48	-150.79	70	57.85	-149.73	71	70-71	94
inshore	57.85	-149.73	71	58.15	-151.00	72	71-72	82
inshore	58.15	-151.00	72	57.58	-150.11	73	72-73	82
inshore	57.58	-150.11	73	57.74	-151.01	74	73-74	56
inshore	57.74	-151.01	74	57.32	-150.48	75	74-75	56
inshore	57.32	-150.48	75	57.33	-151.02	76	75-76	32
inshore	57.33	-151.02	76	57.09	-150.81	77	76-77	30

APPENDIX B

Summary Table of Marine Mammals Observed

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APPENDIX B
Summary Table of Marine Mammals Observed

Key:
AKDT = Alaska daylight time; S# = sighting number; Status = for effort; Type: Effort - Full = two big eye observers, visible horizon and a Beaufort sea state ≤ 5; Fog = two big eye observers, no horizon and a Beaufort sea state ≤ 5; Size = group best estimate; LADD = Latitude in decimal degrees; LODD = Longitude in decimal degrees; (-) Calves = not recorded; (-) Stratum = sighting located outside of the survey area.

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
6/23/2013	13:07:14	1	Dall's porpoise	On	Full	2	-	56.977	-135.611	Sitka-1	-
6/23/2013	13:09:48	2	Unid porpoise	On	Full	2	-	56.956	-135.623	Sitka-1	-
6/23/2013	13:12:18	3	Humpback whale	On	Full	1	-	56.925	-135.592	Sitka-1	-
6/23/2013	13:20:54	4	Humpback whale	On	Full	3	1	56.932	-135.605	Sitka-1	-
6/23/2013	13:22:09	5	Humpback whale	Off	Full	1	-	56.944	-135.597	Sitka-1	-
6/23/2013	13:23:52	6	Humpback whale	On	Full	1	-	56.913	-135.595	Sitka-1	-
6/23/2013	13:36:13	7	Unid porpoise	On	Full	1	-	56.947	-135.718	Sitka-1	-
6/23/2013	13:38:08	8	Unid large whale	On	Full	1	-	56.897	-135.656	Sitka-1	-
6/23/2013	13:38:13	9	Dall's porpoise	On	Full	2	-	56.918	-135.665	Sitka-1	-
6/23/2013	13:40:10	10	Harbor porpoise	On	Full	1	-	56.936	-135.688	Sitka-1	-
6/23/2013	13:46:19	11	Humpback whale	On	Full	1	-	56.904	-135.722	Sitka-1	-
6/23/2013	13:53:19	12	Humpback whale	On	Full	1	-	56.918	-135.757	Sitka-1	-
6/23/2013	14:47:47	13	Dall's porpoise	On	Full	2	-	56.865	-136.075	Sitka-1	-
6/23/2013	15:02:05	14	Dall's porpoise	On	Full	3	-	56.871	-136.08	Sitka-1	-
6/23/2013	15:05:46	15	Dall's porpoise	On	Full	2	-	56.876	-136.106	Sitka-1	-
6/23/2013	15:37:13	16	Unid porpoise	On	Full	1	-	56.85	-136.224	Sitka-1	-
6/23/2013	15:41:49	17	Dall's porpoise	On	Full	4	-	56.859	-136.255	Sitka-1	-

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
6/23/2013	15:43:55	18	Dall's porpoise	On	Full	2	-	56.846	-136.277	Sitka-1	-
6/23/2013	15:52:32	19	Dall's porpoise	On	Full	5	-	56.85	-136.31	Sitka-1	-
6/23/2013	16:02:25	20	Dall's porpoise	On	Full	3	-	56.845	-136.351	Sitka-1	-
6/23/2013	16:03:48	21	Dall's porpoise	On	Full	2	-	56.837	-136.34	Sitka-1	-
6/23/2013	16:20:04	22	Humpback whale	On	Full	1	-	56.824	-136.43	Sitka-1	-
6/23/2013	16:45:26	23	Northern fur seal	On	Full	1	-	56.819	-136.528	Sitka-1	-
6/23/2013	16:49:36	24	Dall's porpoise	On	Full	1	-	56.829	-136.573	Sitka-1	-
6/23/2013	16:53:16	25	Dall's porpoise	On	Full	3	-	56.814	-136.57	Sitka-1	-
6/23/2013	16:53:51	26	Dall's porpoise	On	Full	2	-	56.824	-136.603	Sitka-1	-
6/23/2013	16:54:14	27	Dall's porpoise	On	Full	2	-	56.807	-136.625	Sitka-1	-
6/23/2013	17:04:43	28	Dall's porpoise	On	Full	2	-	56.82	-136.627	Sitka-1	-
6/23/2013	17:08:02	29	Unid large whale	On	Full	1	-	56.799	-136.645	Sitka-1	-
6/23/2013	17:09:27	30	Dall's porpoise	On	Full	1	1	56.805	-136.653	Sitka-1	-
6/23/2013	17:10:48	31	Dall's porpoise	On	Full	2	-	56.788	-136.639	Sitka-1	-
6/23/2013	17:12:29	32	Fin whale	On	Full	1	-	56.769	-136.644	Sitka-1	-
6/23/2013	17:13:45	33	Northern fur seal	On	Full	1	-	56.807	-136.658	Sitka-1	-
6/23/2013	17:15:13	34	Dall's porpoise	On	Full	1	-	56.765	-136.644	Sitka-1	-
6/23/2013	17:20:39	35	Dall's porpoise	On	Full	1	-	56.815	-136.709	Sitka-1	-
6/23/2013	17:23:34	36	Dall's porpoise	On	Full	2	-	56.816	-136.735	Sitka-1	-
6/23/2013	17:25:25	37	Dall's porpoise	On	Full	1	-	56.789	-136.703	Sitka-1	-
6/23/2013	17:31:00	38	Dall's porpoise	On	Full	2	-	56.791	-136.734	Sitka-1	-
6/23/2013	17:31:24	39	Fin whale	On	Full	1	-	56.817	-136.812	Sitka-1	-
6/23/2013	17:37:20	40	Dall's porpoise	On	Full	1	-	56.777	-136.756	Sitka-1	-

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
6/23/2013	17:38:53	41	Fin whale	On	Full	1	-	56.807	-136.801	Sitka-1	-
6/23/2013	17:41:20	42	Dall's porpoise	On	Full	1	-	56.799	-136.816	Sitka-1	-
6/23/2013	17:49:12	43	Dall's porpoise	On	Full	2	-	56.765	-136.806	Sitka-1	-
6/23/2013	17:53:49	44	Fin whale	On	Full	2	-	56.783	-136.884	Sitka-1	-
6/23/2013	18:03:10	45	Fin whale	On	Full	2	-	56.786	-136.927	Sitka-1	-
6/23/2013	18:08:47	46	Dall's porpoise	On	Full	2	-	56.77	-136.911	Sitka-1	-
6/23/2013	18:11:57	47	Dall's porpoise	On	Full	3	-	56.771	-136.912	Sitka-1	-
6/23/2013	18:15:45	48	Dall's porpoise	On	Full	1	-	56.741	-136.915	Sitka-1	-
6/23/2013	18:18:45	49	Fin whale	On	Full	1	-	56.786	-136.997	Sitka-1	-
6/23/2013	18:23:48	50	Fin whale	On	Full	1	-	56.73	-136.995	Sitka-1	-
6/23/2013	18:28:08	51	Fin whale	On	Full	1	-	56.799	-137.069	Sitka-1	-
6/23/2013	18:28:53	52	Fin whale	On	Full	1	-	56.742	-137.019	Sitka-1	-
6/23/2013	18:34:55	53	Fin whale	On	Full	1	-	56.76	-137.091	Sitka-1	-
6/23/2013	18:36:49	54	Fin whale	On	Full	2	1	56.739	-137.016	Sitka-1	-
6/23/2013	18:41:55	55	Northern fur seal	On	Full	1	-	56.752	-137.042	Sitka-1	-
6/23/2013	18:51:32	56	Dall's porpoise	On	Full	2	-	56.746	-137.081	Sitka-1	-
6/23/2013	19:10:42	57	Unid porpoise	On	Full	1	-	56.699	-137.18	Sitka-1	-
6/23/2013	19:17:41	58	Fin whale	On	Full	1	-	56.721	-137.188	Sitka-1	-
6/23/2013	19:34:33	59	Baird's beaked whale	On	Full	6	1	56.723	-137.309	Sitka-1	-
6/23/2013	19:50:10	60	Unid porpoise	On	Full	5	-	56.714	-137.34	Sitka-1	-
6/23/2013	19:59:36	61	Dall's porpoise	On	Full	1	-	56.719	-137.377	Sitka-1	-
6/23/2013	20:08:34	62	Fin/Sei whale	On	Full	1	-	56.74	-137.423	Sitka-1	-
6/23/2013	20:21:00	63	Unid large whale	On	Full	2	-	56.696	-137.465	Sitka-1	-
6/23/2013	20:34:31	64	Unid dolphin	On	Full	1	-	56.682	-137.583	Sitka-1	-
6/23/2013	20:38:50	65	Unid porpoise	On	Full	2	-	56.686	-137.567	Sitka-1	-
6/23/2013	20:39:33	66	Northern fur seal	On	Full	1	-	56.679	-137.541	Sitka-1	-

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
6/23/2013	20:55:12	67	Dall's porpoise	On	Full	1	-	56.692	-137.628	Sitka-1	-
6/23/2013	21:09:09	68	Minke whale	On	Full	3	-	56.675	-137.696	Sitka-1	-
6/23/2013	21:49:35	69	Dall's porpoise	On	Full	2	-	56.648	-137.852	Sitka-1	-
6/24/2013	7:30:26	70	Unid large whale	On	Full	2	-	56.347	-140.432	Sitka-1	-
6/24/2013	7:34:30	71	Unid large whale	On	Full	1	-	56.36	-140.397	Sitka-1	-
6/24/2013	8:43:46	72	Killer whale	On	Full	3	-	56.302	-140.726	Sitka-1	-
6/24/2013	9:40:10	73	Fin whale	On	Full	3	-	56.248	-140.949	Sitka-1	-
6/24/2013	10:34:25	74	Elephant seal	On	Full	1	-	56.247	-141.127	Sitka-1	-
6/24/2013	10:38:01	75	Unid large whale	On	Full	1	-	56.26	-141.25	Sitka-1	-
6/24/2013	10:55:33	76	Unid large whale	On	Full	2	-	56.257	-141.251	Sitka-1	-
6/24/2013	11:12:56	77	Fin whale	On	Full	1	-	56.211	-141.319	Sitka-1	-
6/24/2013	12:26:16	78	Fin whale	On	Full	1	-	56.207	-141.518	Sitka-1	-
6/24/2013	13:38:29	79	Northern fur seal	On	Full	1	-	56.239	-141.675	1-2	Offshore
6/24/2013	13:46:18	80	Dall's porpoise	On	Full	1	-	56.258	-141.653	1-2	Offshore
6/24/2013	14:28:07	81	Northern fur seal	On	Full	1	-	56.372	-141.641	1-2	Offshore
6/24/2013	14:52:00	82	Unid pinniped	On	Full	1	-	56.428	-141.619	1-2	Offshore
6/24/2013	15:46:01	83	Northern fur seal	On	Full	1	-	56.525	-141.573	1-2	Offshore
6/24/2013	17:18:30	84	Unid large whale	On	Full	1	-	56.784	-141.486	1-2	Offshore
6/24/2013	17:28:10	85	Unid large whale	On	Full	2	-	56.773	-141.519	1-2	Offshore
6/24/2013	17:35:07	86	Unid large whale	On	Full	2	-	56.812	-141.463	1-2	Offshore
6/24/2013	17:41:56	87	Fin whale	On	Full	2	-	56.846	-141.497	1-2	Offshore
6/24/2013	17:56:36	88	Fin whale	Off	Full	3	-	56.823	-141.506	1-2	Offshore
6/24/2013	18:30:00	89	Unid large whale	Off	Full	2	-	56.86	-141.552	1-2	Offshore
6/24/2013	22:26:57	90	Baird's beaked whale	On	Full	2	-	57.448	-141.324	1-2	Offshore
6/25/2013	6:03:06	91	Fin whale	On	Full	2	-	56.834	-142.155	2-3	Offshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
6/25/2013	6:22:57	92	Fin whale	On	Full	2	-	56.846	-142.25	2-3	Offshore
6/25/2013	7:44:44	93	Northern fur seal	On	Fog	1	-	56.675	-142.458	2-3	Offshore
6/25/2013	9:04:37	94	Northern fur seal	On	Full	1	-	56.505	-142.664	2-3	Offshore
6/25/2013	9:42:33	95	Dall's porpoise	On	Full	3	-	56.431	-142.785	2-3	Offshore
6/25/2013	10:18:18	96	Northern fur seal	On	Full	1	-	56.46	-142.778	3-4	Offshore
6/25/2013	10:57:24	97	Northern fur seal	On	Full	1	-	56.557	-142.753	3-4	Offshore
6/25/2013	11:25:56	98	Northern fur seal	On	Full	1	-	56.629	-142.727	3-4	Offshore
6/25/2013	12:03:43	99	Northern fur seal	On	Full	1	-	56.713	-142.718	3-4	Offshore
6/25/2013	12:28:53	100	Northern fur seal	On	Full	1	-	56.775	-142.698	3-4	Offshore
6/25/2013	12:52:40	101	Dall's porpoise	On	Full	1	-	56.858	-142.671	3-4	Offshore
6/25/2013	13:08:04	102	Dall's porpoise	On	Full	1	-	56.883	-142.62	3-4	Offshore
6/25/2013	13:15:28	103	Dall's porpoise	On	Full	1	-	56.922	-142.601	3-4	Offshore
6/25/2013	13:16:36	104	Dall's porpoise	On	Full	3	1	56.893	-142.643	3-4	Offshore
6/25/2013	13:52:55	105	Dall's porpoise	On	Full	2	-	56.986	-142.607	3-4	Offshore
6/25/2013	14:15:32	106	Northern fur seal	On	Full	1	-	57.041	-142.587	3-4	Offshore
6/25/2013	15:34:06	107	Unid small whale	On	Full	1	-	57.246	-142.577	3-4	Offshore
6/25/2013	15:43:14	108	Cuvier's beaked whale	On	Full	1	-	57.27	-142.562	3-4	Offshore
6/25/2013	15:49:34	109	Northern fur seal	On	Full	1	-	57.287	-142.558	3-4	Offshore
6/25/2013	16:15:13	110	Unid large whale	On	Full	1	-	57.403	-142.544	3-4	Offshore
6/25/2013	16:20:31	111	Dall's porpoise	On	Full	1	-	57.364	-142.502	3-4	Offshore
6/25/2013	16:23:05	112	Fin whale	On	Full	2	-	57.402	-142.501	3-4	Offshore
6/25/2013	16:34:50	113	Unid large whale	On	Full	2	-	57.426	-142.536	3-4	Offshore
6/25/2013	17:16:44	114	Fin whale	On	Full	2	-	57.523	-142.524	3-4	Offshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
6/25/2013	18:08:31	115	Unid large whale	On	Full	1	-	57.652	-142.497	3-4	Offshore
6/25/2013	18:27:11	116	Northern fur seal	On	Full	2	-	57.646	-142.45	3-4	Offshore
6/25/2013	19:10:45	117	Northern fur seal	On	Full	1	-	57.76	-142.399	3-4	Offshore
6/25/2013	19:33:02	118	Northern fur seal	On	Full	1	-	57.813	-142.396	3-4	Offshore
6/25/2013	20:31:08	119	Northern fur seal	On	Full	1	-	57.722	-142.534	4-5	Offshore
6/25/2013	20:32:15	120	Northern fur seal	On	Full	1	-	57.715	-142.528	4-5	Offshore
6/25/2013	20:34:43	121	Northern fur seal	On	Full	1	-	57.714	-142.529	4-5	Offshore
6/25/2013	21:19:10	122	Fin whale	On	Full	2	-	57.622	-142.659	4-5	Offshore
6/25/2013	21:42:48	123	Fin whale	On	Full	2	-	57.565	-142.79	4-5	Offshore
6/25/2013	21:52:18	124	Fin whale	On	Full	1	-	57.555	-142.819	4-5	Offshore
6/25/2013	21:53:00	125	Fin whale	On	Full	1	-	57.554	-142.74	4-5	Offshore
6/25/2013	21:57:24	126	Fin whale	Off	Full	1	-	57.543	-142.748	4-5	Offshore
6/26/2013	7:01:36	127	Northern fur seal	Off	Off	1	-	56.709	-143.877	5-31 transit	Offshore
6/26/2013	8:51:00	128	Northern fur seal	Off	Off	1	-	56.506	-143.986	31-30	Slope
6/26/2013	10:51:28	129	Unid small whale	On	Fog	1	-	56.21	-144.012	31-30	Seamount
6/26/2013	10:57:19	130	Northern fur seal	On	Fog	1	-	56.201	-144.008	31-30	Seamount
6/26/2013	11:06:58	131	Killer whale	On	Full	3	-	56.157	-144.095	31-30	Seamount
6/26/2013	11:07:07	132	Fin whale	On	Full	2	-	56.177	-143.917	31-30	Seamount
6/26/2013	11:19:23	133	Northern fur seal	On	Full	1	-	56.157	-144.028	31-30	Seamount
6/26/2013	11:27:47	134	Fin whale	On	Full	2	-	56.063	-143.951	31-30	Seamount
6/26/2013	11:35:46	135	Fin/Sei whale	On	Full	1	-	56.101	-144.046	31-30	Seamount
6/26/2013	11:37:04	136	Unid pinniped	On	Full	1	-	56.105	-144.005	31-30	Seamount
6/26/2013	11:40:33	137	Dall's porpoise	On	Full	2	-	56.085	-143.996	31-30	Seamount
6/26/2013	11:56:31	138	Unid large whale	On	Full	2	-	56.017	-144.011	31-30	Seamount
6/26/2013	11:57:39	139	Dall's porpoise	On	Full	2	-	56.061	-144.035	31-30	Seamount
6/26/2013	12:05:09	140	Dall's porpoise	On	Full	2	-	56.038	-144.077	31-30	Seamount

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
6/26/2013	12:07:50	141	Dall's porpoise	On	Full	2	-	56.043	-144.052	31-30	Seamount
6/26/2013	12:15:23	142	Baird's beaked whale	On	Full	7	-	56.002	-144.015	31-30	Seamount
6/26/2013	13:57:48	143	Northern fur seal	Off	Fog	1	-	56.028	-144.038	31-30	Seamount
6/26/2013	14:57:12	144	Fin whale	On	Full	1	-	55.912	-144.023	31-30	Seamount
6/26/2013	16:48:51	145	Blue whale	On	Full	2	-	55.827	-143.895	30-29	Seamount
6/26/2013	17:30:22	146	Dall's porpoise	On	Full	1	-	55.872	-143.815	30-29	Seamount
6/26/2013	18:57:10	147	Unid large whale	On	Full	1	-	56.042	-143.608	30-29	Seamount
6/26/2013	19:14:31	148	Unid large whale	On	Full	1	-	56.062	-143.513	30-29	Seamount
6/26/2013	19:17:55	149	Unid large whale	On	Full	2	-	56.102	-143.478	30-29	Seamount
6/26/2013	19:28:09	150	Fin whale	On	Full	2	-	56.125	-143.462	30-29	Seamount
6/27/2013	10:14:56	151	Unid large whale	On	Full	1	-	55.853	-142.397	28-27	Seamount
6/27/2013	11:17:24	152	Northern fur seal	On	Full	1	-	55.945	-142.254	28-27	Seamount
6/27/2013	11:19:22	153	Unid large whale	On	Full	1	-	55.957	-142.254	28-27	Seamount
6/27/2013	11:59:04	154	Fin whale	On	Full	1	-	55.97	-142.211	28-27	Seamount
6/27/2013	12:14:16	155	Blue whale	On	Full	2	-	55.993	-142.143	28-27	Seamount
6/27/2013	12:30:11	156	Unid large whale	Off	Full	2	-	55.976	-142.088	28-27	Seamount
6/27/2013	12:42:01	157	Unid large whale	Off	Full	2	-	55.972	-142.086	28-27	Seamount
6/27/2013	12:46:33	158	Unid large whale	Off	Full	2	-	55.96	-142.027	28-27	Seamount
6/27/2013	14:33:01	159	Unid large whale	On	Full	1	-	56.198	-141.804	28-27	Offshore
6/27/2013	14:35:31	160	Fin whale	Off	Full	2	-	56.2	-141.796	28-27	Offshore
6/27/2013	15:17:59	161	Fin whale	On	Full	1	-	56.142	-141.79	27-26	Seamount
6/27/2013	15:59:02	162	Unid large whale	On	Full	1	-	56.046	-141.735	27-26	Seamount
6/27/2013	16:24:22	163	Fin whale	On	Full	1	-	55.997	-141.81	27-26	Seamount
6/27/2013	16:34:05	164	Unid large whale	On	Full	1	-	55.98	-141.827	27-26	Seamount
6/27/2013	17:18:18	165	Fin whale	On	Full	4	-	55.88	-141.877	27-26	Seamount
6/28/2013	6:24:44	166	Fin whale	On	Full	2	1	55.663	-141.942	25-24	Seamount

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
6/28/2013	11:35:07	167	Fin whale	On	Full	2	-	55.691	-142.353	24-23	Seamount
6/28/2013	12:24:07	168	Unid small whale	On	Full	1	-	55.818	-142.398	24-23	Seamount
6/28/2013	13:20:15	169	Unid large whale	On	Full	1	-	55.949	-142.321	24-23	Seamount
6/28/2013	14:27:26	170	Northern fur seal	On	Full	1	-	56.074	-142.369	24-23	Seamount
6/28/2013	18:08:52	171	Northern fur seal	On	Full	1	-	56.143	-142.656	23-22	Seamount
6/28/2013	18:30:16	172	Northern fur seal	On	Fog	1	-	56.104	-142.722	23-22	Seamount
6/28/2013	20:18:32	173	Unid Beaked Whale	On	Full	2	-	55.915	-143.029	23-22	Seamount
6/28/2013	21:05:51	174	Dall's porpoise	On	Full	2	-	55.854	-143.119	23-22	Seamount
6/28/2013	21:50:58	175	Dall's porpoise	On	Full	1	-	55.768	-143.249	23-22	Seamount
6/28/2013	22:22:49	176	Dall's porpoise	On	Fog	1	-	55.717	-143.349	23-22	Seamount
6/29/2013	7:18:27	177	Northern fur seal	On	Full	1	-	56.564	-143.474	21-20	Offshore
6/29/2013	7:19:34	178	Minke whale	On	Full	2	1	56.543	-143.483	21-20	Seamount
6/29/2013	11:01:25	179	Dall's porpoise	On	Fog	2	-	56.125	-144.147	21-20	Seamount
6/29/2013	11:06:09	180	Northern fur seal	On	Full	1	-	56.115	-144.151	21-20	Seamount
6/29/2013	11:35:15	181	Fin whale	On	Full	1	-	56.027	-144.226	21-20	Seamount
6/29/2013	14:12:58	182	Dall's porpoise	On	Fog	1	-	55.973	-144.564	20-19	Seamount
6/29/2013	14:15:35	183	Baird's beaked whale	On	Fog	10	-	55.995	-144.511	20-19	Seamount
6/29/2013	14:21:06	184	Dall's porpoise	On	Full	1	-	56.002	-144.58	20-19	Seamount
6/29/2013	14:21:29	185	Blue whale	On	Full	1	-	55.981	-144.55	20-19	Seamount
6/30/2013	6:39:16	186	Unid Beaked Whale	On	Full	1	-	57.423	-143.61	5-6	Offshore
6/30/2013	8:06:24	187	Northern fur seal	On	Full	1	-	57.627	-143.627	5-6	Offshore
6/30/2013	8:06:44	188	Fin whale	On	Full	1	-	57.625	-143.558	5-6	Offshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
6/30/2013	8:15:34	189	Unid large whale	On	Full	1	-	57.695	-143.619	5-6	Offshore
6/30/2013	8:43:52	190	Fin whale	On	Full	1	-	57.759	-143.566	5-6	Offshore
6/30/2013	8:57:30	191	Fin whale	On	Full	1	-	57.812	-143.597	5-6	Offshore
6/30/2013	8:58:10	192	Fin whale	On	Full	2	-	57.768	-143.572	5-6	Offshore
6/30/2013	9:03:13	193	Fin whale	On	Full	2	-	57.795	-143.589	5-6	Offshore
6/30/2013	9:18:04	194	Unid porpoise	On	Full	2	-	57.824	-143.567	5-6	Offshore
6/30/2013	10:08:23	195	Unid Beaked Whale	On	Full	2	-	57.942	-143.494	5-6	Offshore
6/30/2013	10:46:24	196	Fin whale	On	Full	2	-	58.055	-143.488	5-6	Offshore
6/30/2013	10:50:57	197	Fin whale	On	Full	2	-	58.062	-143.447	5-6	Offshore
6/30/2013	12:37:10	198	Unid large whale	On	Full	1	-	58.071	-143.637	6-7	Offshore
6/30/2013	12:39:28	199	Northern fur seal	On	Full	1	-	58.087	-143.564	6-7	Offshore
6/30/2013	12:41:38	200	Fin whale	On	Full	1	-	58.063	-143.51	6-7	Offshore
6/30/2013	13:54:14	201	Northern fur seal	On	Full	1	-	57.937	-143.728	6-7	Offshore
6/30/2013	13:55:44	202	Fin whale	On	Full	2	-	57.936	-143.777	6-7	Offshore
6/30/2013	15:25:01	203	Fin whale	On	Full	2	-	57.756	-144.01	6-7	Offshore
6/30/2013	15:27:57	204	Unid large whale	On	Full	4	-	57.807	-144.087	6-7	Offshore
6/30/2013	15:30:40	205	Fin whale	On	Full	3	-	57.73	-144.043	6-7	Offshore
6/30/2013	15:31:23	206	Fin whale	On	Full	1	-	57.727	-144.043	6-7	Offshore
6/30/2013	15:34:38	207	Fin whale	On	Full	3	-	57.744	-144.036	6-7	Offshore
6/30/2013	16:01:10	208	Dall's porpoise	On	Full	4	-	57.698	-144.049	6-7	Offshore
6/30/2013	16:03:44	209	Dall's porpoise	On	Full	6	-	57.701	-144.048	6-7	Offshore
6/30/2013	17:05:45	210	Northern fur seal	On	Full	1	-	57.575	-144.179	6-7	Offshore
6/30/2013	17:17:51	211	Dall's porpoise	On	Full	1	-	57.529	-144.184	6-7	Offshore
6/30/2013	18:19:30	212	Northern fur seal	On	Full	1	-	57.43	-144.374	6-7	Offshore
6/30/2013	18:30:51	213	Fin whale	On	Full	3	-	57.382	-144.352	6-7	Offshore
6/30/2013	20:18:20	214	Northern fur seal	On	Full	1	-	57.19	-144.669	6-7	Offshore
7/1/2013	6:26:59	215	Dall's porpoise	On	Full	3	-	57.898	-144.732	7-8	Offshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/1/2013	6:57:38	216	Dall's porpoise	On	Full	3	-	57.965	-144.715	7-8	Offshore
7/1/2013	7:18:51	217	Dall's porpoise	On	Full	5	-	58.046	-144.702	7-8	Offshore
7/1/2013	7:43:50	218	Dall's porpoise	On	Full	5	-	58.1	-144.666	7-8	Offshore
7/1/2013	7:56:08	219	Dall's porpoise	On	Full	1	-	58.126	-144.657	7-8	Offshore
7/1/2013	8:02:15	220	Dall's porpoise	On	Full	1	-	58.149	-144.683	7-8	Offshore
7/1/2013	8:10:34	221	Dall's porpoise	On	Full	1	-	58.158	-144.656	7-8	Offshore
7/1/2013	8:17:34	222	Dall's porpoise	On	Full	1	-	58.18	-144.649	7-8	Offshore
7/1/2013	8:23:58	223	Fin whale	On	Full	1	-	58.212	-144.607	7-8	Offshore
7/1/2013	8:31:22	224	Dall's porpoise	On	Full	2	-	58.233	-144.624	7-8	Offshore
7/1/2013	8:35:58	225	Dall's porpoise	On	Full	1	-	58.226	-144.618	7-8	Offshore
7/1/2013	8:36:55	226	Dall's porpoise	On	Full	3	1	58.23	-144.617	7-8	Offshore
7/1/2013	8:40:17	227	Fin whale	On	Full	8	-	58.298	-144.548	7-8	Offshore
7/1/2013	8:40:49	228	Dall's porpoise	On	Full	2	-	58.24	-144.607	7-8	Offshore
7/1/2013	8:41:38	229	Dall's porpoise	On	Full	2	-	58.258	-144.601	7-8	Offshore
7/1/2013	8:56:18	230	Fin whale	On	Full	2	-	58.287	-144.613	7-8	Offshore
7/1/2013	9:07:33	231	Northern fur seal	On	Full	1	-	58.311	-144.583	7-8	Offshore
7/1/2013	9:25:45	232	Unid large whale	Off	Full	1	-	58.414	-144.5	7-8	Offshore
7/1/2013	9:46:34	233	Fin whale	On	Full	2	1	58.415	-144.518	7-8	Offshore
7/1/2013	9:47:48	234	Fin whale	On	Full	2	-	58.442	-144.532	7-8	Offshore
7/1/2013	11:50:17	235	Unid large whale	Off	Full	1	-	58.44	-144.694	8-9	Offshore
7/1/2013	11:51:23	236	Unid large whale	On	Full	1	-	58.411	-144.753	8-9	Offshore
7/1/2013	14:57:19	237	Fin whale	Off	Off	1	-	58.044	-145.12	8-9	Offshore
7/1/2013	15:02:56	238	Humpback whale	Off	Off	1	-	58.03	-145.13	8-9	Offshore
7/1/2013	15:14:49	239	Fin whale	Off	Off	1	-	58.007	-145.163	8-9	Offshore
7/1/2013	15:23:07	240	Unid large whale	Off	Off	1	-	57.971	-145.185	8-9	Offshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/1/2013	18:55:07	241	Northern fur seal	Off	Off	1	-	57.667	-145.568	8-9	Offshore
7/2/2013	6:01:53	242	Unid large whale	Off	Fog	1	-	57.802	-145.975	9-10	Offshore
7/2/2013	6:06:01	243	Unid large whale	On	Fog	3	-	57.814	-145.971	9-10	Offshore
7/2/2013	6:13:47	244	Unid large whale	On	Fog	1	-	57.861	-145.935	9-10	Offshore
7/2/2013	6:15:11	245	Fin whale	On	Fog	1	-	57.84	-145.951	9-10	Offshore
7/2/2013	6:16:16	246	Unid large whale	On	Fog	2	-	57.843	-145.961	9-10	Offshore
7/2/2013	6:27:48	247	Fin whale	On	Fog	1	-	57.889	-145.942	9-10	Offshore
7/2/2013	6:35:03	248	Fin whale	On	Fog	3	-	57.897	-145.943	9-10	Offshore
7/2/2013	7:31:36	249	Dall's porpoise	On	Full	2	-	58.033	-145.876	9-10	Offshore
7/2/2013	9:09:09	250	Unid large whale	On	Full	1	-	58.288	-145.841	9-10	Offshore
7/2/2013	10:23:18	251	Unid large whale	On	Full	1	-	58.482	-145.688	9-10	Offshore
7/2/2013	10:30:10	252	Unid large whale	On	Full	1	-	58.488	-145.682	9-10	Offshore
7/2/2013	10:54:56	253	Northern fur seal	On	Full	1	-	58.543	-145.713	9-10	Offshore
7/2/2013	11:19:49	254	Unid large whale	On	Full	2	-	58.655	-145.6	9-10	Offshore
7/2/2013	11:19:51	255	Fin whale	On	Full	1	-	58.64	-145.706	9-10	Offshore
7/2/2013	11:30:01	256	Humpback whale	On	Full	1	-	58.662	-145.658	9-10	Offshore
7/2/2013	11:30:04	257	Fin whale	On	Full	1	-	58.665	-145.669	9-10	Offshore
7/2/2013	11:40:12	258	Dall's porpoise	Off	Full	2	-	58.658	-145.681	9-10	Offshore
7/2/2013	11:45:02	259	Fin whale	On	Full	4	-	58.706	-145.663	9-10	Offshore
7/2/2013	11:56:55	260	Humpback whale	Off	Full	1	-	58.685	-145.647	9-10	Offshore
7/2/2013	14:50:01	261	Fin whale	On	Full	1	-	58.664	-145.865	10-11	Offshore
7/2/2013	16:30:28	262	Fin whale	On	Full	1	-	58.477	-146.222	10-11	Offshore
7/2/2013	18:42:19	263	Fin whale	On	Full	2	-	58.169	-146.325	10-11	Offshore
7/2/2013	18:51:41	264	Humpback whale	On	Full	1	-	58.134	-146.423	10-11	Offshore
7/2/2013	19:48:14	265	Unid large whale	On	Full	1	-	58.034	-146.519	10-11	Offshore
7/2/2013	20:21:17	266	Fin whale	On	Full	1	-	57.981	-146.595	10-11	Offshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/2/2013	20:27:50	267	Unid large whale	On	Full	3	1	57.951	-146.663	10-11	Offshore
7/2/2013	21:29:16	268	Unid large whale	On	Full	1	-	57.889	-146.788	10-11	Offshore
7/3/2013	8:36:15	269	Dall's porpoise	On	Full	1	-	56.508	-147.304	37-36	Seamount
7/3/2013	11:15:19	270	Northern fur seal	On	Full	1	-	56.615	-147.008	37-36	Seamount
7/3/2013	11:17:31	271	Northern fur seal	On	Full	1	-	56.619	-147.002	37-36	Seamount
7/3/2013	13:22:49	272	Killer whale	On	Full	7	-	56.875	-146.581	37-36	Seamount
7/3/2013	19:13:52	273	Northern fur seal	Off	Fog	1	-	56.759	-146.216	35-34	Seamount
7/3/2013	20:42:08	274	Sperm whale	On	Full	2	-	56.523	-146.206	35-34	Seamount
7/3/2013	21:23:22	275	Blue whale	On	Full	1	-	56.427	-146.213	35-34	Seamount
7/3/2013	21:52:27	276	Humpback whale	On	Full	1	-	56.365	-146.146	35-34	Seamount
7/3/2013	22:19:49	277	Humpback whale	On	Full	1	-	56.353	-146.125	35-34	Seamount
7/4/2013	19:21:18	278	Blue whale	On	Fog	1	-	56.329	-144.559	32-31	Seamount
7/5/2013	9:57:52	279	Dall's porpoise	On	Full	1	-	56.436	-145.636	18-17	Seamount
7/5/2013	10:37:28	280	Dall's porpoise	On	Full	2	1	56.529	-145.662	18-17	Seamount
7/5/2013	15:47:37	281	Northern fur seal	On	Full	1	-	56.866	-145.896	17-16	Seamount
7/5/2013	19:30:49	282	Northern fur seal	Off	Fog	1	-	56.509	-146.474	17-16	Seamount
7/5/2013	19:46:07	283	Dall's porpoise	Off	Fog	7	-	56.483	-146.51	17-16	Seamount
7/6/2013	11:41:11	284	Dall's porpoise	On	Full	2	-	56.599	-147.735	15-14	Seamount
7/6/2013	13:06:21	285	Dall's porpoise	On	Full	1	-	56.61	-147.88	14-13	Seamount
7/6/2013	13:12:04	286	Dall's porpoise	On	Full	2	-	56.606	-147.884	14-13	Seamount
7/6/2013	14:51:48	287	Dall's porpoise	On	Full	1	-	56.852	-147.867	14-13	Seamount
7/6/2013	15:48:21	288	Northern fur seal	On	Full	1	-	56.996	-147.875	14-13	Seamount
7/6/2013	16:06:29	289	Northern fur seal	On	Full	1	-	57.043	-147.886	14-13	Seamount

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/6/2013	16:47:01	290	Humpback whale	On	Full	1	-	57.135	-147.96	14-13	Seamount
7/6/2013	17:10:19	291	Dall's porpoise	On	Full	2	-	57.196	-147.886	14-13	Seamount
7/6/2013	18:11:36	292	Dall's porpoise	On	Full	1	-	57.349	-147.899	14-13	Seamount
7/6/2013	18:13:30	293	Dall's porpoise	On	Full	1	-	57.346	-147.889	14-13	Seamount
7/6/2013	18:28:57	294	Dall's porpoise	On	Full	2	-	57.399	-147.901	14-13	Seamount
7/7/2013	7:36:17	295	Dall's porpoise	On	Full	2	-	56.773	-148.451	38-39	Seamount
7/7/2013	9:02:23	296	Humpback whale	On	Full	2	-	57.036	-148.528	38-39	Slope
7/7/2013	9:05:27	297	Unid large whale	On	Full	1	-	56.992	-148.529	38-39	Seamount
7/7/2013	10:21:58	298	Unid large whale	On	Full	1	-	57.066	-148.554	39-40 transit	Slope
7/7/2013	10:26:03	299	Unid large whale	On	Full	2	-	57.1	-148.579	39-40 transit	Slope
7/7/2013	10:39:02	300	Unid large whale	On	Full	1	-	57.066	-148.678	39-40 transit	Slope
7/7/2013	11:41:57	301	Fin whale	On	Full	2	-	57.063	-148.929	39-40 transit	Slope
7/7/2013	11:41:58	302	Unid large whale	On	Full	1	-	57.043	-148.902	39-40 transit	Slope
7/7/2013	11:50:22	303	Dall's porpoise	On	Full	2	-	57.07	-148.909	39-40 transit	Slope
7/7/2013	12:00:46	304	Dall's porpoise	On	Full	2	-	57.069	-148.952	39-40 transit	Slope
7/7/2013	14:07:30	305	Dall's porpoise	Off	Off	3	-	57.075	-149.471	39-40 transit	Slope
7/7/2013	17:14:23	306	Dall's porpoise	Off	Off	6	-	57.086	-150.075	39-40 transit	Slope
7/7/2013	19:08:33	307	Northern fur seal	On	Full	1	-	57.092	-150.503	39-40 transit	Slope
7/8/2013	8:30:21	308	Baird's beaked whale	On	Full	16	-	57.28	-150.08	42-43	Slope
7/8/2013	9:46:49	309	Fin whale	Off	Full	1	-	57.278	-150.164	42-43	Slope
7/8/2013	10:07:13	310	Baird's beaked whale	Off	Full	9	-	57.279	-150.168	42-43	Slope

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/8/2013	13:29:28	311	Northern fur seal	On	Full	2	-	57.155	-149.794	42-43	Slope
7/8/2013	14:48:23	312	Unid large whale	On	Full	1	-	57.047	-149.433	42-43	Slope
7/8/2013	15:27:11	313	Unid large whale	On	Full	1	-	56.984	-149.255	42-43	Slope
7/8/2013	16:05:10	314	Fin whale	On	Full	2	1	56.95	-149.176	42-43	Slope
7/8/2013	16:08:23	315	Dall's porpoise	Off	Full	2	-	56.972	-149.171	42-43	Slope
7/8/2013	16:49:54	316	Fin whale	Off	Full	1	-	56.928	-148.994	42-43	Slope
7/8/2013	18:32:21	317	Dall's porpoise	On	Full	5	-	56.934	-148.907	43-44	Slope
7/8/2013	18:37:45	318	Unid large whale	On	Full	1	-	56.951	-148.966	43-44	Slope
7/8/2013	18:47:20	319	Dall's porpoise	On	Full	10	-	56.965	-148.965	43-44	Slope
7/8/2013	18:50:01	320	Fin whale	On	Full	1	-	57.011	-148.96	43-44	Slope
7/8/2013	18:54:00	321	Dall's porpoise	On	Full	5	-	56.968	-148.983	43-44	Slope
7/8/2013	19:00:47	322	Dall's porpoise	On	Full	14	-	56.985	-149.003	43-44	Slope
7/8/2013	19:02:21	323	Dall's porpoise	On	Full	6	-	57.003	-149.063	43-44	Slope
7/8/2013	19:04:20	324	Dall's porpoise	On	Full	3	-	57.003	-149.033	43-44	Slope
7/8/2013	19:05:29	325	Dall's porpoise	On	Full	2	-	57.014	-149.04	43-44	Slope
7/8/2013	19:13:01	326	Dall's porpoise	On	Full	20	-	57.012	-149.045	43-44	Slope
7/8/2013	19:14:29	327	Dall's porpoise	On	Full	15	-	57.016	-149.038	43-44	Slope
7/8/2013	19:15:49	328	Dall's porpoise	On	Full	9	-	57.007	-149.062	43-44	Slope
7/8/2013	20:35:30	329	Dall's porpoise	On	Full	1	-	57.17	-149.337	43-44	Slope
7/8/2013	20:41:17	330	Dall's porpoise	On	Full	6	-	57.173	-149.358	43-44	Slope
7/8/2013	20:42:05	331	Unid large whale	On	Full	1	-	57.171	-149.417	43-44	Slope
7/9/2013	11:56:56	332	Dall's porpoise	On	Full	2	-	57.418	-148.928	45-46	Slope
7/9/2013	12:15:44	333	Dall's porpoise	On	Full	7	-	57.453	-149.005	45-46	Slope
7/9/2013	12:46:59	334	Fin whale	On	Full	3	-	57.499	-149.151	45-46	Slope

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/9/2013	12:51:42	335	Fin whale	On	Full	2	-	57.491	-149.137	45-46	Slope
7/9/2013	12:58:36	336	Fin whale	On	Full	1	-	57.494	-149.214	45-46	Slope
7/9/2013	13:56:38	337	Killer whale	On	Full	45	3	57.674	-149.385	45-46	Slope
7/9/2013	15:14:52	338	Killer whale	On	Full	2	-	57.716	-149.541	45-46	Slope
7/9/2013	15:23:53	339	Killer whale	On	Full	5	-	57.763	-149.592	45-46	Slope
7/9/2013	15:43:08	340	Killer whale	On	Full	5	-	57.808	-149.63	45-46	Slope
7/9/2013	15:44:19	341	Killer whale	On	Full	3	-	57.801	-149.625	45-46	Slope
7/9/2013	15:44:29	342	Killer whale	On	Full	6	-	57.798	-149.579	45-46	Slope
7/9/2013	15:49:15	343	Killer whale	On	Full	5	1	57.824	-149.634	45-46	Slope
7/9/2013	15:53:52	344	Killer whale	On	Full	7	-	57.821	-149.659	45-46	Slope
7/9/2013	15:54:27	345	Killer whale	On	Full	3	-	57.833	-149.679	45-46	Slope
7/9/2013	16:01:58	346	Killer whale	On	Full	3	-	57.847	-149.672	45-46	Slope
7/9/2013	16:03:40	347	Killer whale	On	Full	1	-	57.841	-149.648	45-46	Slope
7/9/2013	16:13:23	348	Killer whale	On	Full	20	1	57.833	-149.663	45-46	Slope
7/9/2013	16:40:48	349	Killer whale	On	Full	2	-	57.806	-149.655	46-47	Slope
7/9/2013	17:46:15	350	Northern fur seal	On	Fog	1	-	57.777	-149.418	46-47	Slope
7/9/2013	19:25:39	351	Minke whale	On	Full	1	-	57.67	-149.044	46-47	Slope
7/9/2013	20:15:43	352	Fin whale	On	Full	2	-	57.593	-148.761	46-47	Slope
7/9/2013	20:25:01	353	Fin whale	On	Full	1	-	57.601	-148.716	46-47	Slope
7/9/2013	21:16:00	354	Dall's porpoise	On	Full	2	-	57.541	-148.614	46-47	Slope
7/9/2013	21:51:55	355	Dall's porpoise	On	Full	5	-	57.498	-148.467	46-47	Slope
7/9/2013	21:55:23	356	Dall's porpoise	On	Full	2	-	57.51	-148.434	46-47	Slope
7/9/2013	21:59:25	357	Northern fur seal	On	Full	2	-	57.491	-148.429	46-47	Slope
7/9/2013	22:33:33	358	Fin whale	On	Full	1	-	57.431	-148.245	46-47	Slope
7/9/2013	22:37:32	359	Sperm whale	On	Full	1	-	57.455	-148.272	46-47	Slope
7/9/2013	22:39:13	358	Fin whale	On	Full	1	-	57.415	-148.23	46-47	Slope
7/9/2013	22:57:53	360	Fin whale	On	Full	2	-	57.44	-148.167	46-47	Slope
7/9/2013	23:02:53	361	Sperm whale	On	Full	1	-	57.418	-148.196	46-47	Slope
7/10/2013	7:11:21	362	Unid large whale	On	Full	1	-	57.994	-149.133	47-48	Slope
7/10/2013	8:33:23	363	Humpback whale	On	Full	1	-	58.098	-149.288	48-49	Slope
7/10/2013	8:41:52	364	Unid porpoise	On	Full	1	-	58.099	-149.25	48-49	Slope
7/10/2013	10:15:54	365	Fin whale	On	Full	1	-	57.966	-148.852	48-49	Slope

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/10/2013	10:26:01	366	Fin whale	Off	Full	1	-	57.943	-148.821	48-49	Slope
7/10/2013	12:40:05	367	Sperm whale	On	Full	1	-	57.843	-148.415	48-49	Slope
7/10/2013	12:44:44	368	Unid large whale	Off	Full	1	-	57.837	-148.434	48-49	Slope
7/10/2013	12:45:15	369	Sperm whale	On	Full	1	-	57.829	-148.363	48-49	Slope
7/10/2013	13:21:04	370	Unid large whale	On	Full	1	-	57.784	-148.156	48-49	Slope
7/10/2013	13:34:41	371	Sperm whale	On	Full	1	-	57.75	-148.17	48-49	Slope
7/10/2013	13:43:46	372	Sperm whale	On	Full	2	-	57.774	-148.085	48-49	Slope
7/10/2013	13:59:53	373	Sperm whale	On	Full	1	-	57.724	-148.088	48-49	Slope
7/10/2013	14:08:02	374	Unid large whale	On	Full	1	-	57.747	-148.017	48-49	Slope
7/10/2013	14:10:53	375	Sperm whale	On	Full	1	-	57.722	-147.987	48-49	Slope
7/10/2013	15:05:19	376	Unid large whale	On	Fog	1	-	57.64	-147.78	48-49	Slope
7/10/2013	16:13:25	377	Fin whale	On	Fog	2	-	57.634	-147.589	48-49	Slope
7/10/2013	17:20:53	378	Unid large whale	On	Fog	1	-	57.731	-147.78	49-50	Slope
7/10/2013	17:43:01	379	Fin whale	On	Fog	1	-	57.764	-147.856	49-50	Slope
7/10/2013	17:44:34	380	Unid large whale	On	Fog	1	-	57.698	-147.91	49-50	Slope
7/10/2013	17:51:16	381	Killer whale	On	Full	1	-	57.782	-147.808	49-50	Slope
7/10/2013	18:05:45	382	Dall's porpoise	On	Full	4	-	57.755	-147.897	49-50	Slope
7/10/2013	21:48:41	383	Northern fur seal	On	Full	1	-	58.138	-148.562	49-50	Slope
7/11/2013	6:02:52	384	Fin whale	On	Full	1	-	58.048	-147.863	50-51	Slope
7/11/2013	6:28:32	385	Northern fur seal	On	Full	1	-	58.023	-147.746	50-51	Slope
7/11/2013	6:50:27	386	Dall's porpoise	On	Full	1	-	57.988	-147.66	50-51	Slope
7/11/2013	6:56:12	387	Unid porpoise	On	Full	4	-	57.986	-147.587	50-51	Slope
7/11/2013	7:01:23	388	Dall's porpoise	On	Full	4	-	57.959	-147.543	50-51	Slope
7/11/2013	7:12:40	389	Unid porpoise	On	Full	10	-	57.955	-147.516	50-51	Slope

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/11/2013	7:27:02	390	Dall's porpoise	On	Full	1	-	57.939	-147.477	50-51	Slope
7/11/2013	7:27:51	391	Unid small whale	On	Full	1	-	57.931	-147.512	50-51	Slope
7/11/2013	7:45:55	392	Dall's porpoise	On	Full	25	-	57.956	-147.447	50-51	Slope
7/11/2013	7:59:00	393	Unid large whale	On	Full	1	-	57.911	-147.351	50-51	Slope
7/11/2013	8:00:16	394	Dall's porpoise	On	Full	17	-	57.908	-147.329	50-51	Slope
7/11/2013	8:02:48	395	Unid porpoise	On	Full	3	-	57.883	-147.35	50-51	Slope
7/11/2013	8:07:31	396	Dall's porpoise	On	Full	8	-	57.901	-147.4	50-51	Slope
7/11/2013	8:11:15	397	Sperm whale	On	Full	2	-	57.885	-147.332	50-51	Slope
7/11/2013	8:19:47	398	Sperm whale	On	Full	1	-	57.868	-147.327	50-51	Slope
7/11/2013	8:25:03	399	Unid large whale	On	Full	1	-	57.832	-147.378	50-51	Slope
7/11/2013	8:28:28	400	Fin whale	On	Full	1	-	57.858	-147.29	50-51	Slope
7/11/2013	8:41:18	401	Northern fur seal	On	Full	1	-	57.864	-147.248	50-51	Slope
7/11/2013	8:46:18	402	Sperm whale	On	Full	1	-	57.893	-147.303	51-52	Slope
7/11/2013	8:49:03	403	Sperm whale	On	Full	1	-	57.895	-147.309	51-52	Slope
7/11/2013	9:08:55	404	Dall's porpoise	On	Full	10	-	57.947	-147.368	51-52	Slope
7/11/2013	9:11:54	405	Dall's porpoise	On	Full	17	-	57.947	-147.353	51-52	Slope
7/11/2013	9:13:22	406	Dall's porpoise	On	Full	8	-	57.901	-147.369	51-52	Slope
7/11/2013	9:13:51	407	Dall's porpoise	On	Full	8	-	57.946	-147.332	51-52	Slope
7/11/2013	9:15:55	408	Sperm whale	On	Full	1	-	57.929	-147.366	51-52	Slope
7/11/2013	9:19:54	409	Sperm whale	On	Full	1	-	57.919	-147.383	51-52	Slope
7/11/2013	9:28:07	410	Dall's porpoise	On	Full	2	-	57.944	-147.392	51-52	Slope
7/11/2013	9:29:54	411	Dall's porpoise	On	Full	15	-	57.988	-147.363	51-52	Slope

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/11/2013	9:35:55	412	Dall's porpoise	On	Full	2	-	57.957	-147.409	51-52	Slope
7/11/2013	10:02:20	413	Fin whale	On	Full	1	-	57.992	-147.541	51-52	Slope
7/11/2013	10:05:34	414	Unid large whale	On	Full	1	-	58.065	-147.509	51-52	Slope
7/11/2013	11:05:13	415	Killer whale	On	Full	6	-	58.107	-147.711	51-52	Slope
7/11/2013	11:46:58	416	Fin whale	On	Full	3	-	58.143	-147.746	51-52	Slope
7/11/2013	11:47:22	417	Unid large whale	On	Full	1	-	58.159	-147.73	51-52	Slope
7/11/2013	12:54:47	418	Baird's beaked whale	On	Full	8	-	58.204	-147.917	51-52	Slope
7/11/2013	13:40:30	419	Fin whale	On	Full	1	-	58.316	-148.053	51-52	Slope
7/11/2013	14:14:03	420	Dall's porpoise	On	Full	2	-	58.351	-148.097	51-52	Slope
7/11/2013	15:12:22	421	Dall's porpoise	On	Full	2	-	58.479	-148.309	51-52	Slope
7/11/2013	15:13:12	422	Unid Beaked Whale	On	Full	2	-	58.478	-148.29	51-52	Slope
7/11/2013	15:25:17	423	Fin whale	On	Full	2	1	58.489	-148.422	51-52	Slope
7/11/2013	15:31:27	424	Dall's porpoise	On	Full	4	-	58.496	-148.404	51-52	Slope
7/11/2013	15:45:46	425	Fin whale	Off	Full	1	-	58.497	-148.42	51-52	Slope
7/11/2013	16:54:07	426	Dall's porpoise	On	Full	3	-	58.618	-148.518	51-52	Slope
7/11/2013	18:43:59	427	Dall's porpoise	On	Full	1	-	58.523	-148.214	52-53	Slope
7/11/2013	19:07:54	428	Fin whale	On	Full	1	-	58.485	-148.113	52-53	Slope
7/11/2013	19:11:38	429	Unid large whale	On	Full	1	-	58.524	-148.072	52-53	Slope
7/11/2013	20:10:53	430	Dall's porpoise	On	Full	3	-	58.408	-147.816	52-53	Slope
7/11/2013	20:20:16	431	Fin whale	On	Full	2	1	58.393	-147.828	52-53	Slope
7/11/2013	21:43:18	432	Unid large whale	On	Full	2	-	58.222	-147.466	52-53	Slope
7/11/2013	21:53:50	433	Fin whale	On	Full	2	-	58.256	-147.353	52-53	Slope
7/11/2013	22:03:56	434	Fin whale	On	Full	1	-	58.243	-147.331	52-53	Slope
7/12/2013	11:06:05	435	Unid large whale	On	Full	1	-	58.725	-147.715	54-55	Slope
7/12/2013	11:15:07	436	Unid large whale	On	Full	1	-	58.738	-147.678	54-55	Slope
7/12/2013	11:22:16	437	Unid large whale	Off	Full	1	-	58.731	-147.661	54-55	Slope

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/12/2013	11:31:04	438	Fin/Sei whale	On	Full	1	-	58.713	-147.653	54-55	Slope
7/12/2013	11:41:08	439	Fin whale	On	Full	1	-	58.702	-147.578	54-55	Slope
7/12/2013	12:18:12	440	Unid large whale	On	Full	1	-	58.662	-147.337	54-55	Slope
7/12/2013	14:00:21	441	Fin whale	On	Full	1	-	58.497	-146.97	54-55	Slope
7/12/2013	14:13:16	442	Fin whale	On	Full	2	-	58.5	-146.99	54-55	Slope
7/12/2013	14:20:15	443	Elephant seal	On	Full	1	-	58.495	-146.951	54-55	Slope
7/12/2013	14:58:35	444	Elephant seal	On	Full	1	-	58.461	-146.787	54-55	Slope
7/12/2013	14:58:43	445	Fin whale	On	Full	3	-	58.432	-146.709	54-55	Slope
7/12/2013	15:03:46	446	Dall's porpoise	On	Full	3	-	58.447	-146.783	54-55	Slope
7/12/2013	15:08:48	447	Unid large whale	On	Full	1	-	58.394	-146.779	54-55	Slope
7/12/2013	15:17:45	448	Dall's porpoise	On	Full	1	-	58.44	-146.708	54-55	Slope
7/12/2013	15:29:06	449	Fin whale	On	Full	1	-	58.397	-146.646	54-55	Slope
7/12/2013	15:33:03	450	Fin whale	On	Full	1	-	58.408	-146.659	54-55	Slope
7/12/2013	15:36:58	451	Dall's porpoise	On	Full	4	-	58.403	-146.642	54-55	Slope
7/12/2013	15:56:44	452	Elephant seal	On	Full	1	-	58.369	-146.56	54-55	Slope
7/12/2013	16:05:41	453	Dall's porpoise	On	Full	4	-	58.337	-146.454	54-55	Slope
7/12/2013	16:56:44	454	Unid large whale	On	Full	1	-	58.379	-146.628	55-56	Slope
7/12/2013	17:00:59	455	Unid large whale	On	Full	1	-	58.396	-146.618	55-56	Slope
7/12/2013	17:03:27	456	Fin whale	On	Full	1	-	58.395	-146.593	55-56	Slope
7/12/2013	17:09:01	457	Fin whale	On	Full	2	1	58.391	-146.574	55-56	Slope
7/12/2013	17:12:36	458	Fin whale	Off	Full	1	-	58.399	-146.555	55-56	Slope
7/12/2013	17:26:29	459	Fin whale	On	Full	1	-	58.447	-146.62	55-56	Slope
7/12/2013	17:32:16	460	Dall's porpoise	Off	Full	2	-	58.44	-146.617	55-56	Slope
7/12/2013	17:34:15	461	Fin whale	Off	Full	1	-	58.438	-146.589	55-56	Slope
7/12/2013	17:51:07	462	Dall's porpoise	On	Full	1	-	58.471	-146.656	55-56	Slope
7/12/2013	18:51:06	463	Sperm whale	On	Full	1	-	58.616	-146.807	55-56	Slope
7/12/2013	19:44:49	464	Northern fur seal	On	Full	1	-	58.688	-147.07	55-56	Slope

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/12/2013	19:45:21	465	Dall's porpoise	On	Full	1	-	58.694	-147.042	55-56	Slope
7/12/2013	19:46:06	466	Dall's porpoise	On	Full	5	-	58.703	-147.122	55-56	Slope
7/12/2013	19:48:42	467	Sperm whale	On	Full	1	-	58.713	-147.093	55-56	Slope
7/12/2013	20:33:03	468	Dall's porpoise	On	Full	2	-	58.791	-147.207	55-56	Slope
7/12/2013	20:37:23	469	Northern fur seal	On	Full	1	-	58.784	-147.24	55-56	Slope
7/12/2013	21:33:28	470	Sperm whale	On	Full	1	-	58.91	-147.452	55-56	Slope
7/12/2013	21:54:12	471	Dall's porpoise	On	Full	1	-	58.934	-147.456	55-56	Slope
7/12/2013	22:13:05	472	Unid large whale	On	Full	2	-	59.016	-147.486	55-56	Slope
7/12/2013	22:36:43	473	Sperm whale	On	Full	2	-	59.024	-147.668	55-56	Slope
7/13/2013	6:06:36	474	Dall's porpoise	On	Full	1	-	59.502	-147.922	60-59	Inshore
7/13/2013	6:13:03	475	Dall's porpoise	On	Full	1	-	59.496	-147.945	60-59	Inshore
7/13/2013	6:13:27	476	Dall's porpoise	On	Full	2	-	59.504	-147.921	60-59	Inshore
7/13/2013	6:16:54	477	Dall's porpoise	On	Full	1	-	59.497	-147.891	60-59	Inshore
7/13/2013	6:22:54	478	Dall's porpoise	On	Full	2	-	59.477	-147.883	60-59	Inshore
7/13/2013	6:25:47	479	Dall's porpoise	On	Full	7	1	59.495	-147.884	60-59	Inshore
7/13/2013	6:34:15	480	Dall's porpoise	Off	Full	3	-	59.504	-147.882	60-59	Inshore
7/13/2013	6:38:53	481	Dall's porpoise	Off	Full	2	-	59.524	-147.898	60-59	-
7/13/2013	6:44:45	482	Dall's porpoise	Off	Full	2	-	59.53	-147.935	60-59	-
7/13/2013	6:47:17	483	Dall's porpoise	Off	Full	2	-	59.529	-147.902	60-59	-
7/13/2013	6:52:21	484	Dall's porpoise	Off	Full	3	-	59.517	-147.893	60-59	-
7/13/2013	8:05:44	485	Dall's porpoise	On	Full	3	-	59.481	-147.845	60-59	Inshore
7/13/2013	8:06:35	486	Northern fur seal	On	Full	1	-	59.474	-147.826	60-59	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/13/2013	8:07:57	487	Dall's porpoise	On	Full	3	-	59.496	-147.834	60-59	-
7/13/2013	8:08:15	488	Dall's porpoise	On	Full	3	-	59.459	-147.859	60-59	Inshore
7/13/2013	8:08:59	489	Dall's porpoise	On	Full	4	-	59.462	-147.825	60-59	Inshore
7/13/2013	8:09:58	490	Dall's porpoise	On	Full	3	-	59.464	-147.808	60-59	Inshore
7/13/2013	8:11:10	491	Dall's porpoise	On	Full	2	-	59.472	-147.801	60-59	Inshore
7/13/2013	8:11:33	492	Dall's porpoise	On	Full	2	-	59.494	-147.806	60-59	-
7/13/2013	8:12:33	493	Dall's porpoise	On	Full	4	-	59.466	-147.835	60-59	Inshore
7/13/2013	8:13:36	494	Dall's porpoise	On	Full	2	-	59.458	-147.806	60-59	Inshore
7/13/2013	8:14:49	495	Dall's porpoise	On	Full	4	-	59.504	-147.763	60-59	-
7/13/2013	8:15:11	496	Dall's porpoise	On	Full	8	-	59.475	-147.797	60-59	Inshore
7/13/2013	8:15:58	497	Dall's porpoise	On	Full	1	-	59.511	-147.764	60-59	-
7/13/2013	8:16:30	498	Dall's porpoise	On	Full	2	-	59.462	-147.762	60-59	Inshore
7/13/2013	8:17:30	499	Dall's porpoise	On	Full	2	-	59.486	-147.772	60-59	-
7/13/2013	8:17:55	500	Unid large whale	On	Full	1	-	59.411	-147.756	60-59	Inshore
7/13/2013	8:19:20	501	Dall's porpoise	On	Full	3	1	59.474	-147.766	60-59	Inshore
7/13/2013	8:20:36	502	Dall's porpoise	On	Full	6	-	59.468	-147.784	60-59	Inshore
7/13/2013	8:20:41	503	Dall's porpoise	On	Full	2	-	59.453	-147.777	60-59	Inshore
7/13/2013	8:22:15	504	Dall's porpoise	On	Full	1	-	59.499	-147.735	60-59	-
7/13/2013	8:26:52	505	Unid pinniped	On	Full	1	-	59.472	-147.764	60-59	Inshore
7/13/2013	8:29:45	506	Dall's porpoise	On	Full	3	-	59.445	-147.679	60-59	Inshore
7/13/2013	8:30:02	507	Dall's porpoise	On	Full	3	-	59.47	-147.754	60-59	Inshore
7/13/2013	8:39:14	508	Dall's porpoise	On	Full	1	-	59.436	-147.666	60-59	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/13/2013	8:40:38	509	Dall's porpoise	On	Full	2	-	59.455	-147.653	60-59	-
7/13/2013	8:46:09	510	Dall's porpoise	On	Full	2	-	59.453	-147.645	60-59	Inshore
7/13/2013	8:49:59	511	Dall's porpoise	On	Full	3	-	59.449	-147.615	60-59	-
7/13/2013	8:57:09	512	Northern fur seal	On	Full	1	-	59.436	-147.633	60-59	Inshore
7/13/2013	9:00:06	513	Dall's porpoise	On	Full	2	-	59.432	-147.592	60-59	Inshore
7/13/2013	9:01:17	514	Dall's porpoise	On	Full	1	-	59.459	-147.604	60-59	-
7/13/2013	9:07:03	515	Fin whale	On	Full	1	-	59.415	-147.524	60-59	Inshore
7/13/2013	9:10:23	516	Dall's porpoise	On	Full	1	-	59.449	-147.556	60-59	-
7/13/2013	9:10:48	517	Dall's porpoise	On	Full	2	-	59.425	-147.585	60-59	Inshore
7/13/2013	9:18:21	518	Dall's porpoise	On	Full	2	-	59.395	-147.489	60-59	Inshore
7/13/2013	9:19:39	519	Dall's porpoise	On	Full	3	-	59.39	-147.568	60-59	Inshore
7/13/2013	9:20:06	520	Dall's porpoise	On	Full	2	-	59.444	-147.496	60-59	-
7/13/2013	9:21:02	521	Dall's porpoise	On	Full	4	-	59.406	-147.546	60-59	Inshore
7/13/2013	9:26:23	522	Dall's porpoise	On	Fog	5	-	59.395	-147.508	60-59	Inshore
7/13/2013	9:29:17	523	Dall's porpoise	On	Fog	2	-	59.417	-147.464	60-59	-
7/13/2013	9:37:18	524	Dall's porpoise	On	Fog	2	-	59.42	-147.472	60-59	-
7/13/2013	9:41:19	525	Dall's porpoise	On	Fog	4	-	59.401	-147.435	60-59	Inshore
7/13/2013	9:46:24	526	Dall's porpoise	On	Full	3	-	59.376	-147.424	60-59	Inshore
7/13/2013	9:49:34	527	Dall's porpoise	On	Full	4	-	59.386	-147.355	60-59	Slope
7/13/2013	9:50:29	528	Dall's porpoise	On	Full	1	-	59.413	-147.406	60-59	-
7/13/2013	9:52:33	529	Dall's porpoise	On	Full	3	-	59.367	-147.383	60-59	Slope
7/13/2013	9:55:17	530	Dall's porpoise	On	Full	1	-	59.391	-147.407	60-59	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/13/2013	9:59:44	531	Dall's porpoise	On	Full	4	-	59.399	-147.358	60-59	-
7/13/2013	10:02:41	532	Killer whale	On	Full	2	-	59.357	-147.287	60-59	Slope
7/13/2013	10:04:41	533	Harbor porpoise	On	Full	1	-	59.377	-147.359	60-59	Slope
7/13/2013	10:08:17	534	Dall's porpoise	On	Full	1	-	59.35	-147.313	58-57	Slope
7/13/2013	10:08:59	535	Harbor porpoise	On	Full	1	-	59.376	-147.33	58-57	Slope
7/13/2013	10:12:23	536	Dall's porpoise	On	Full	3	-	59.346	-147.314	58-57	Slope
7/13/2013	10:18:59	537	Dall's porpoise	On	Full	2	-	59.344	-147.321	58-57	Slope
7/13/2013	10:20:13	538	Dall's porpoise	Off	Full	2	-	59.359	-147.324	58-57	Slope
7/13/2013	10:21:05	539	Dall's porpoise	On	Full	1	-	59.359	-147.3	58-57	Slope
7/13/2013	10:26:00	540	Fin whale	On	Full	1	-	59.314	-147.332	58-57	Slope
7/13/2013	10:29:49	541	Dall's porpoise	On	Full	2	-	59.357	-147.245	58-57	Slope
7/13/2013	10:39:56	542	Dall's porpoise	On	Full	2	-	59.289	-147.247	58-57	Slope
7/13/2013	10:43:14	543	Unid pinniped	On	Full	1	-	59.298	-147.232	58-57	Slope
7/13/2013	10:43:15	544	Dall's porpoise	On	Full	3	1	59.313	-147.252	58-57	Slope
7/13/2013	10:46:05	545	Dall's porpoise	On	Full	3	-	59.312	-147.234	58-57	Slope
7/13/2013	10:48:32	546	Unid pinniped	On	Full	1	-	59.296	-147.253	58-57	Slope
7/13/2013	10:48:53	547	Dall's porpoise	On	Full	2	-	59.293	-147.259	58-57	Slope
7/13/2013	10:49:34	548	Dall's porpoise	On	Full	3	-	59.291	-147.26	58-57	Slope
7/13/2013	10:55:04	549	Dall's porpoise	On	Full	2	-	59.293	-147.211	58-57	Slope
7/13/2013	11:07:26	550	Dall's porpoise	On	Full	3	-	59.284	-147.117	58-57	Slope
7/13/2013	11:08:59	551	Dall's porpoise	On	Full	3	-	59.26	-147.167	58-57	Slope
7/13/2013	11:15:05	552	Dall's porpoise	On	Full	3	-	59.272	-147.117	58-57	Slope
7/13/2013	11:15:33	553	Dall's porpoise	On	Full	7	-	59.261	-147.163	58-57	Slope

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/13/2013	11:16:48	554	Dall's porpoise	On	Full	3	-	59.255	-147.108	58-57	Slope
7/13/2013	11:21:42	555	Dall's porpoise	On	Full	1	-	59.248	-147.139	58-57	Slope
7/13/2013	11:23:42	556	Dall's porpoise	On	Full	2	-	59.219	-147.154	58-57	Slope
7/13/2013	11:25:22	557	Dall's porpoise	On	Full	2	-	59.24	-147.06	58-57	Slope
7/13/2013	11:28:14	558	Fin whale	On	Full	2	-	59.224	-146.979	58-57	Slope
7/13/2013	11:29:04	559	Dall's porpoise	On	Full	1	-	59.239	-147.093	58-57	Slope
7/13/2013	11:31:02	560	Dall's porpoise	On	Full	1	-	59.23	-147.066	58-57	Slope
7/13/2013	11:31:34	561	Dall's porpoise	On	Full	1	-	59.206	-147.12	58-57	Slope
7/13/2013	11:41:50	562	Dall's porpoise	On	Full	2	-	59.19	-147.066	58-57	Slope
7/13/2013	11:41:50	563	Dall's porpoise	On	Full	3	-	59.173	-147.058	58-57	Slope
7/13/2013	11:42:17	564	Dall's porpoise	On	Full	2	-	59.212	-147.067	58-57	Slope
7/13/2013	11:43:47	565	Dall's porpoise	On	Full	5	-	59.196	-147.095	58-57	Slope
7/13/2013	11:44:27	566	Fin whale	On	Full	1	-	59.197	-147.05	58-57	Slope
7/13/2013	11:44:57	567	Dall's porpoise	On	Full	2	-	59.196	-147.049	58-57	Slope
7/13/2013	11:46:18	568	Dall's porpoise	On	Full	4	-	59.215	-147.037	58-57	Slope
7/13/2013	11:52:12	569	Elephant seal	On	Full	1	-	59.167	-147.033	58-57	Slope
7/13/2013	11:54:35	570	Dall's porpoise	On	Full	2	-	59.177	-147.046	58-57	Slope
7/13/2013	11:57:09	571	Dall's porpoise	On	Full	3	-	59.182	-147.003	58-57	Slope
7/13/2013	11:58:46	572	Elephant seal	On	Full	1	-	59.157	-147.012	58-57	Slope
7/13/2013	12:02:06	573	Dall's porpoise	On	Full	1	-	59.196	-146.945	58-57	Slope
7/13/2013	12:02:30	574	Dall's porpoise	On	Full	2	-	59.176	-147.002	58-57	Slope
7/13/2013	12:02:43	575	Dall's porpoise	On	Full	2	-	59.164	-147.016	58-57	Slope
7/13/2013	12:07:38	576	Dall's porpoise	On	Full	2	-	59.178	-146.923	58-57	Slope

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/13/2013	12:15:03	577	Dall's porpoise	On	Full	3	-	59.167	-146.906	58-57	Slope
7/13/2013	12:17:32	578	Dall's porpoise	On	Full	2	-	59.14	-146.969	58-57	Slope
7/13/2013	12:18:47	579	Dall's porpoise	On	Full	2	-	59.146	-146.942	58-57	Slope
7/13/2013	12:21:05	580	Dall's porpoise	On	Full	1	-	59.105	-146.971	58-57	Slope
7/13/2013	12:30:11	581	Dall's porpoise	On	Full	2	-	59.106	-146.947	58-57	Slope
7/13/2013	12:42:29	582	Elephant seal	On	Full	1	-	59.071	-146.859	58-57	Slope
7/13/2013	13:12:57	583	Elephant seal	On	Full	1	-	59.049	-146.763	58-57	Slope
7/13/2013	14:23:15	584	Dall's porpoise	On	Full	3	-	58.891	-146.551	58-57	Slope
7/13/2013	15:38:30	585	Dall's porpoise	On	Full	1	-	58.759	-146.315	58-57	Slope
7/13/2013	15:43:32	586	Fin whale	On	Full	1	-	58.778	-146.255	58-57	Slope
7/13/2013	15:44:11	587	Fin whale	On	Full	1	-	58.783	-146.291	58-57	Slope
7/13/2013	15:58:25	588	Fin whale	On	Full	1	-	58.743	-146.274	58-57	Slope
7/13/2013	16:17:28	589	Unid porpoise	On	Full	1	-	58.718	-146.24	58-57	Slope
7/13/2013	16:31:54	590	Fin whale	On	Full	1	-	58.653	-146.141	58-57	Slope
7/13/2013	17:08:59	591	Unid Beaked Whale	On	Full	1	-	58.598	-146.093	58-57	Slope
7/13/2013	17:32:55	592	Dall's porpoise	On	Full	1	-	58.592	-146.085	58-57	Slope
7/13/2013	17:32:56	593	Fin whale	On	Full	1	-	58.589	-146.118	58-57	Slope
7/13/2013	17:48:13	594	Fin whale	On	Full	2	-	58.641	-146.142	57-56	Slope
7/13/2013	17:50:31	595	Northern fur seal	On	Full	1	-	58.609	-146.176	57-56	Slope
7/13/2013	18:44:09	596	Fin whale	On	Full	1	-	58.694	-146.421	57-56	Slope
7/13/2013	18:54:59	597	Fin whale	On	Full	1	-	58.687	-146.436	57-56	Slope
7/13/2013	19:01:22	598	Dall's porpoise	On	Full	1	-	58.724	-146.471	57-56	Slope
7/13/2013	19:09:00	599	Dall's porpoise	On	Full	2	-	58.721	-146.469	57-56	Slope
7/13/2013	19:54:32	600	Fin whale	On	Full	1	-	58.794	-146.718	57-56	Slope
7/13/2013	20:02:18	601	Dall's porpoise	On	Full	1	-	58.795	-146.698	57-56	Slope
7/13/2013	20:20:28	602	Fin whale	On	Full	1	-	58.764	-146.858	57-56	Slope

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/13/2013	20:41:44	603	Northern fur seal	On	Full	1	-	58.848	-146.874	57-56	Slope
7/13/2013	20:59:19	604	Dall's porpoise	On	Full	2	-	58.879	-146.939	57-56	Slope
7/13/2013	21:35:43	605	Fin whale	On	Full	1	-	58.888	-147.216	57-56	Slope
7/13/2013	21:52:44	606	Dall's porpoise	On	Full	1	-	58.938	-147.184	57-56	Slope
7/13/2013	22:14:32	607	Dall's porpoise	On	Full	3	-	58.991	-147.251	57-56	Slope
7/13/2013	22:22:27	608	Dall's porpoise	On	Full	2	-	58.987	-147.337	57-56	Slope
7/14/2013	6:00:00	609	Dall's porpoise	On	Full	1	-	59.367	-148.788	61-62	Inshore
7/14/2013	6:25:53	610	Fin whale	On	Full	1	-	59.36	-148.746	62-63	Inshore
7/14/2013	6:33:44	611	Unid large whale	On	Full	1	-	59.338	-148.711	62-63	Inshore
7/14/2013	6:36:33	612	Fin whale	On	Full	4	-	59.34	-148.758	62-63	Inshore
7/14/2013	6:58:53	613	Fin whale	On	Full	1	-	59.333	-148.722	62-63	Inshore
7/14/2013	7:09:07	614	Fin whale	On	Full	1	-	59.3	-148.755	62-63	Inshore
7/14/2013	7:12:27	615	Fin whale	On	Full	1	-	59.298	-148.733	62-63	Inshore
7/14/2013	7:32:47	616	Fin whale	On	Full	1	-	59.263	-148.666	62-63	Inshore
7/14/2013	7:33:27	617	Unid large whale	On	Full	2	-	59.214	-148.654	62-63	Inshore
7/14/2013	7:39:25	618	Fin whale	On	Full	1	-	59.253	-148.66	62-63	Inshore
7/14/2013	7:52:52	619	Fin whale	On	Full	3	-	59.185	-148.656	62-63	Inshore
7/14/2013	7:54:29	620	Unid large whale	On	Full	1	-	59.175	-148.668	62-63	Inshore
7/14/2013	7:57:31	621	Northern fur seal	On	Full	2	-	59.215	-148.64	62-63	Inshore
7/14/2013	8:48:51	622	Fin whale	On	Full	1	-	59.084	-148.512	62-63	Inshore
7/14/2013	8:52:31	623	Unid large whale	On	Full	1	-	59.147	-148.394	62-63	Inshore
7/14/2013	9:01:58	624	Fin whale	On	Full	1	-	59.083	-148.418	62-63	Inshore
7/14/2013	9:20:37	625	Fin whale	On	Full	1	-	59.067	-148.388	62-63	Inshore
7/14/2013	9:20:40	626	Unid large whale	On	Full	1	-	59.065	-148.381	62-63	Inshore
7/14/2013	9:23:39	627	Unid large whale	On	Full	1	-	59.086	-148.373	62-63	Inshore
7/14/2013	9:27:08	628	Fin whale	Off	Full	2	-	59.081	-148.334	62-63	Inshore
7/14/2013	9:30:19	629	Fin whale	Off	Full	2	-	59.06	-148.4	62-63	Inshore
7/14/2013	9:34:14	630	Unid large whale	On	Full	1	-	59.066	-148.316	62-63	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/14/2013	9:42:36	631	Unid large whale	On	Full	1	-	58.999	-148.296	62-63	Inshore
7/14/2013	10:07:49	632	Fin whale	Off	Full	1	-	58.999	-148.282	62-63	Inshore
7/14/2013	10:41:15	633	Unid large whale	On	Full	1	-	58.936	-148.18	62-63	Inshore
7/14/2013	10:41:50	634	Fin whale	On	Full	1	-	58.944	-148.261	62-63	Inshore
7/14/2013	10:43:18	635	Elephant seal	On	Full	1	-	58.946	-148.26	62-63	Inshore
7/14/2013	10:47:24	636	Fin whale	On	Full	1	-	58.925	-148.211	62-63	Inshore
7/14/2013	10:51:11	637	Fin whale	On	Full	1	-	58.911	-148.212	62-63	Inshore
7/14/2013	10:51:54	638	Fin whale	On	Full	2	-	58.893	-148.205	62-63	Inshore
7/14/2013	11:01:30	639	Fin whale	On	Full	1	-	58.878	-148.177	62-63	Inshore
7/14/2013	11:09:29	640	Fin whale	On	Full	3	1	58.878	-148.146	62-63	Inshore
7/14/2013	11:21:00	641	Fin whale	On	Full	3	-	58.863	-148.156	62-63	Inshore
7/14/2013	11:29:41	642	Unid large whale	On	Full	1	-	58.911	-148.194	63-64	Inshore
7/14/2013	11:35:33	643	Fin whale	On	Full	1	-	58.906	-148.241	63-64	Inshore
7/14/2013	12:03:30	644	Fin whale	On	Full	1	-	58.965	-148.346	63-64	Inshore
7/14/2013	12:14:03	645	Elephant seal	On	Full	1	-	58.942	-148.348	63-64	Inshore
7/14/2013	12:33:55	646	Unid porpoise	On	Full	1	-	58.956	-148.45	63-64	Inshore
7/14/2013	12:36:34	647	Dall's porpoise	On	Full	2	-	58.962	-148.447	63-64	Inshore
7/14/2013	12:48:40	648	Elephant seal	On	Full	1	-	58.96	-148.513	63-64	Inshore
7/14/2013	12:57:15	649	Northern fur seal	On	Full	1	-	58.978	-148.525	63-64	Inshore
7/14/2013	12:58:49	650	Northern fur seal	On	Full	1	-	58.974	-148.535	63-64	Inshore
7/14/2013	13:32:24	651	Fin whale	On	Full	1	-	59.037	-148.73	63-64	Inshore
7/14/2013	13:36:34	652	Fin whale	On	Full	1	-	58.977	-148.738	63-64	Inshore
7/14/2013	13:43:42	653	Unid large whale	On	Full	1	-	58.975	-148.773	63-64	Inshore
7/14/2013	13:46:23	654	Fin whale	On	Full	2	-	59.033	-148.762	63-64	Inshore
7/14/2013	13:53:52	655	Fin whale	On	Full	1	-	59.034	-148.751	63-64	Inshore
7/14/2013	13:53:55	656	Fin whale	On	Full	2	-	59.042	-148.74	63-64	Inshore
7/14/2013	14:06:00	657	Fin whale	On	Full	1	-	59.083	-148.812	63-64	Inshore
7/14/2013	14:17:51	658	Fin whale	On	Full	1	-	59.079	-148.837	63-64	Inshore
7/14/2013	14:19:58	659	Elephant seal	On	Full	1	-	59.058	-148.864	63-64	Inshore
7/14/2013	14:34:33	660	Dall's porpoise	On	Full	1	-	59.077	-148.925	63-64	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/14/2013	14:37:44	661	Dall's porpoise	On	Full	1	-	59.07	-148.918	63-64	Inshore
7/14/2013	14:38:31	662	Harbor porpoise	On	Full	2	-	59.071	-148.929	63-64	Inshore
7/14/2013	14:41:05	663	Harbor porpoise	On	Full	1	-	59.082	-148.947	63-64	Inshore
7/14/2013	14:42:06	664	Harbor porpoise	On	Full	2	-	59.074	-148.946	63-64	Inshore
7/14/2013	14:47:22	665	Harbor porpoise	On	Full	1	-	59.101	-148.994	63-64	Inshore
7/14/2013	14:48:02	666	Dall's porpoise	On	Full	3	1	59.078	-148.971	63-64	Inshore
7/14/2013	14:49:06	667	Dall's porpoise	On	Full	2	-	59.082	-148.976	63-64	Inshore
7/14/2013	14:56:23	668	Dall's porpoise	On	Full	1	-	59.083	-148.997	63-64	Inshore
7/14/2013	15:03:38	669	Dall's porpoise	On	Full	1	-	59.096	-149.021	63-64	Inshore
7/14/2013	15:08:22	670	Dall's porpoise	On	Full	2	1	59.132	-149.042	63-64	Inshore
7/14/2013	15:19:32	671	Harbor porpoise	On	Full	2	1	59.111	-149.119	63-64	Inshore
7/14/2013	15:26:15	672	Dall's porpoise	On	Full	2	-	59.122	-149.171	63-64	Inshore
7/14/2013	15:31:42	673	Dall's porpoise	On	Full	2	-	59.133	-149.131	63-64	Inshore
7/14/2013	15:35:28	674	Unid porpoise	On	Full	2	-	59.123	-149.162	63-64	Inshore
7/14/2013	15:35:43	675	Unid porpoise	On	Full	3	-	59.126	-149.183	63-64	Inshore
7/14/2013	15:39:58	676	Dall's porpoise	On	Full	2	-	59.121	-149.165	63-64	Inshore
7/14/2013	15:41:59	677	Dall's porpoise	On	Full	2	-	59.131	-149.197	63-64	Inshore
7/14/2013	15:42:31	678	Dall's porpoise	On	Full	3	1	59.126	-149.166	63-64	Inshore
7/14/2013	15:43:56	679	Fin whale	On	Full	2	-	59.168	-149.204	63-64	Inshore
7/14/2013	15:46:23	680	Dall's porpoise	On	Full	2	-	59.145	-149.208	63-64	Inshore
7/14/2013	15:49:53	681	Dall's porpoise	On	Full	2	-	59.137	-149.21	63-64	Inshore
7/14/2013	15:50:14	682	Dall's porpoise	On	Full	1	-	59.136	-149.186	63-64	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/14/2013	15:57:10	683	Dall's porpoise	On	Full	2	-	59.163	-149.239	63-64	Inshore
7/14/2013	16:04:45	684	Unid large whale	On	Full	1	-	59.1	-149.355	63-64	Inshore
7/14/2013	16:07:00	685	Unid porpoise	On	Full	1	-	59.128	-149.334	63-64	Inshore
7/14/2013	16:08:43	686	Unid porpoise	On	Full	1	-	59.142	-149.306	63-64	Inshore
7/14/2013	16:09:48	687	Dall's porpoise	On	Full	1	-	59.163	-149.276	63-64	Inshore
7/14/2013	16:10:18	688	Dall's porpoise	On	Full	1	-	59.154	-149.281	63-64	Inshore
7/14/2013	16:14:16	689	Dall's porpoise	On	Full	2	-	59.157	-149.302	63-64	Inshore
7/14/2013	16:17:29	690	Dall's porpoise	On	Full	2	-	59.143	-149.328	63-64	Inshore
7/14/2013	16:17:41	691	Dall's porpoise	On	Full	2	-	59.154	-149.306	63-64	Inshore
7/14/2013	16:31:11	692	Dall's porpoise	On	Full	2	-	59.183	-149.414	63-64	Inshore
7/14/2013	16:35:29	693	Northern fur seal	On	Full	1	-	59.182	-149.398	63-64	Inshore
7/14/2013	16:36:17	694	Dall's porpoise	On	Full	1	-	59.197	-149.409	63-64	Inshore
7/14/2013	16:42:07	695	Dall's porpoise	On	Full	1	-	59.194	-149.455	63-64	Inshore
7/14/2013	16:42:49	696	Northern fur seal	On	Full	1	-	59.182	-149.397	63-64	Inshore
7/14/2013	16:49:33	697	Dall's porpoise	Off	Full	2	-	59.188	-149.419	63-64	Inshore
7/14/2013	16:57:14	698	Dall's porpoise	Off	Full	1	-	59.183	-149.407	64-65	Inshore
7/14/2013	17:01:29	699	Dall's porpoise	On	Full	2	-	59.147	-149.431	64-65	Inshore
7/14/2013	17:06:25	700	Dall's porpoise	On	Full	2	-	59.162	-149.312	64-65	Inshore
7/14/2013	17:09:38	701	Unid dolphin	On	Full	1	-	59.138	-149.336	64-65	Inshore
7/14/2013	17:13:40	702	Dall's porpoise	On	Full	1	-	59.143	-149.352	64-65	Inshore
7/14/2013	17:16:09	703	Dall's porpoise	On	Full	2	-	59.124	-149.316	64-65	Inshore
7/14/2013	17:25:03	704	Dall's porpoise	On	Full	2	-	59.14	-149.323	64-65	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/14/2013	17:26:17	705	Dall's porpoise	On	Full	1	-	59.119	-149.325	64-65	Inshore
7/14/2013	17:28:10	706	Unid porpoise	On	Full	1	-	59.118	-149.306	64-65	Inshore
7/14/2013	17:28:33	707	Dall's porpoise	On	Full	1	-	59.101	-149.295	64-65	Inshore
7/14/2013	17:33:34	708	Dall's porpoise	On	Full	3	1	59.116	-149.262	64-65	Inshore
7/14/2013	17:34:12	709	Northern fur seal	On	Full	1	-	59.108	-149.291	64-65	Inshore
7/14/2013	17:37:23	710	Dall's porpoise	On	Full	1	-	59.098	-149.273	64-65	Inshore
7/14/2013	17:40:41	711	Dall's porpoise	On	Full	2	-	59.106	-149.294	64-65	Inshore
7/14/2013	17:40:42	712	Dall's porpoise	On	Full	1	-	59.081	-149.262	64-65	Inshore
7/14/2013	17:43:52	713	Dall's porpoise	On	Full	1	-	59.07	-149.249	64-65	Inshore
7/14/2013	17:50:18	714	Dall's porpoise	On	Full	1	-	59.083	-149.223	64-65	Inshore
7/14/2013	17:52:21	715	Dall's porpoise	On	Full	2	-	59.083	-149.251	64-65	Inshore
7/14/2013	17:55:58	716	Northern fur seal	On	Full	1	-	59.068	-149.253	64-65	Inshore
7/14/2013	17:57:31	717	Dall's porpoise	On	Full	4	1	59.076	-149.236	64-65	Inshore
7/14/2013	18:02:13	718	Dall's porpoise	On	Full	3	-	59.022	-149.249	64-65	Inshore
7/14/2013	18:02:31	719	Unid large whale	On	Full	1	-	59.026	-149.276	64-65	Inshore
7/14/2013	18:05:18	720	Dall's porpoise	On	Full	3	-	59.079	-149.154	64-65	Inshore
7/14/2013	18:09:11	721	Dall's porpoise	On	Full	1	-	59.054	-149.183	64-65	Inshore
7/14/2013	18:17:32	722	Northern fur seal	On	Full	1	-	59.018	-149.21	64-65	Inshore
7/14/2013	18:17:55	723	Dall's porpoise	On	Full	3	-	59.032	-149.174	64-65	Inshore
7/14/2013	18:27:52	724	Dall's porpoise	On	Full	3	-	59.000	-149.181	64-65	Inshore
7/14/2013	18:38:31	725	Unid dolphin	On	Full	2	-	59.018	-149.068	64-65	Inshore
7/14/2013	18:53:56	726	Dall's porpoise	Off	Full	2	-	59.014	-149.09	64-65	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/14/2013	19:07:07	727	Dall's porpoise	On	Full	2	-	58.967	-149.146	64-65	Inshore
7/14/2013	19:12:02	728	Dall's porpoise	On	Full	5	-	58.977	-149.075	64-65	Inshore
7/14/2013	19:19:02	729	Dall's porpoise	On	Full	1	-	58.965	-149.071	64-65	Inshore
7/14/2013	19:20:35	730	Dall's porpoise	On	Full	2	-	58.965	-149.071	64-65	Inshore
7/14/2013	19:23:53	731	Dall's porpoise	On	Full	3	-	58.962	-149.061	64-65	Inshore
7/14/2013	19:36:41	732	Dall's porpoise	On	Full	2	1	58.925	-149.045	64-65	Inshore
7/14/2013	19:39:12	733	Dall's porpoise	On	Full	1	-	58.933	-149.029	64-65	Inshore
7/14/2013	19:39:54	734	Dall's porpoise	On	Full	1	-	58.936	-149.01	64-65	Inshore
7/14/2013	19:40:09	735	Dall's porpoise	On	Full	2	-	58.929	-149.032	64-65	Inshore
7/14/2013	19:41:48	736	Dall's porpoise	On	Full	1	-	58.934	-149.006	64-65	Inshore
7/14/2013	19:45:23	737	Dall's porpoise	On	Full	4	1	58.919	-149	64-65	Inshore
7/14/2013	19:47:59	738	Elephant seal	On	Full	1	-	58.904	-148.978	64-65	Inshore
7/14/2013	19:49:22	739	Dall's porpoise	On	Full	1	-	58.914	-148.999	64-65	Inshore
7/14/2013	19:57:06	740	Dall's porpoise	On	Full	1	-	58.899	-148.987	64-65	Inshore
7/14/2013	19:58:43	741	Dall's porpoise	On	Full	3	-	58.881	-148.943	64-65	Inshore
7/14/2013	20:03:27	742	Dall's porpoise	On	Full	3	-	58.879	-148.95	64-65	Inshore
7/14/2013	20:09:06	743	Elephant seal	On	Full	1	-	58.873	-148.925	64-65	Inshore
7/14/2013	20:12:32	744	Fin whale	On	Full	1	-	58.888	-148.85	64-65	Inshore
7/14/2013	20:23:03	745	Elephant seal	Off	Full	1	-	58.877	-148.878	64-65	Inshore
7/14/2013	20:46:05	746	Dall's porpoise	Off	Full	3	-	58.861	-148.958	64-65	Inshore
7/14/2013	20:54:29	747	Dall's porpoise	On	Full	2	-	58.841	-148.872	64-65	Inshore
7/14/2013	20:55:41	748	Dall's porpoise	On	Full	1	-	58.858	-148.909	64-65	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/14/2013	20:59:41	749	Dall's porpoise	On	Full	1	-	58.827	-148.851	64-65	Inshore
7/14/2013	21:00:56	750	Dall's porpoise	On	Full	1	-	58.844	-148.856	64-65	Inshore
7/14/2013	21:02:46	751	Dall's porpoise	On	Full	1	-	58.838	-148.869	64-65	Inshore
7/14/2013	21:07:35	752	Dall's porpoise	On	Full	1	-	58.827	-148.88	64-65	Inshore
7/14/2013	21:08:49	753	Dall's porpoise	On	Full	1	-	58.826	-148.827	64-65	Inshore
7/14/2013	21:09:49	754	Dall's porpoise	On	Full	2	1	58.819	-148.841	64-65	Inshore
7/14/2013	21:10:44	755	Dall's porpoise	On	Full	1	-	58.814	-148.862	64-65	Inshore
7/14/2013	21:13:46	756	Dall's porpoise	On	Full	3	-	58.837	-148.79	64-65	Inshore
7/14/2013	21:15:07	757	Dall's porpoise	On	Full	2	-	58.818	-148.865	64-65	Inshore
7/14/2013	21:25:21	758	Dall's porpoise	On	Full	2	-	58.791	-148.83	64-65	Inshore
7/14/2013	21:30:11	759	Dall's porpoise	On	Full	1	-	58.786	-148.793	64-65	Inshore
7/14/2013	21:31:20	760	Dall's porpoise	On	Full	1	-	58.784	-148.834	64-65	Inshore
7/14/2013	21:31:53	761	Dall's porpoise	On	Full	2	-	58.784	-148.75	64-65	Inshore
7/14/2013	21:33:37	762	Dall's porpoise	On	Full	1	-	58.783	-148.786	64-65	Inshore
7/14/2013	21:35:14	763	Dall's porpoise	On	Full	5	-	58.786	-148.768	64-65	Inshore
7/14/2013	21:37:14	764	Dall's porpoise	On	Full	1	-	58.772	-148.75	64-65	Inshore
7/14/2013	21:44:10	765	Dall's porpoise	On	Full	1	-	58.761	-148.731	64-65	Inshore
7/14/2013	21:46:32	766	Dall's porpoise	On	Full	2	-	58.755	-148.796	64-65	Inshore
7/14/2013	21:53:01	767	Dall's porpoise	On	Full	1	-	58.729	-148.716	64-65	Inshore
7/14/2013	21:57:42	768	Elephant seal	On	Full	1	-	58.743	-148.745	64-65	Inshore
7/14/2013	22:01:18	769	Dall's porpoise	On	Full	1	-	58.75	-148.719	64-65	Inshore
7/14/2013	22:01:53	770	Dall's porpoise	On	Full	5	-	58.73	-148.728	64-65	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/14/2013	22:06:01	771	Dall's porpoise	On	Full	2	-	58.739	-148.695	64-65	Inshore
7/14/2013	22:06:38	772	Fin whale	On	Full	1	-	58.688	-148.639	64-65	Inshore
7/14/2013	22:15:24	773	Dall's porpoise	On	Full	1	-	58.718	-148.69	64-65	Inshore
7/14/2013	22:25:19	774	Dall's porpoise	On	Full	1	-	58.703	-148.653	64-65	Inshore
7/14/2013	22:33:57	775	Fin whale	On	Full	1	-	58.666	-148.646	64-65	Inshore
7/14/2013	22:40:15	776	Unid large whale	On	Full	1	-	58.685	-148.53	64-65	Inshore
7/14/2013	22:42:10	777	Fin whale	On	Full	1	-	58.673	-148.625	64-65	Inshore
7/14/2013	22:46:58	778	Fin whale	On	Full	1	-	58.591	-148.583	64-65	Inshore
7/14/2013	22:48:22	779	Fin whale	On	Full	2	-	58.653	-148.543	64-65	Inshore
7/15/2013	6:00:32	780	Fin whale	On	Full	3	1	58.934	-149.76	65-66	Inshore
7/15/2013	6:15:24	781	Dall's porpoise	On	Full	2	-	58.943	-149.786	65-66	Inshore
7/15/2013	6:21:39	782	Unid pinniped	On	Full	1	-	58.963	-149.814	65-66	Inshore
7/15/2013	6:38:19	783	Unid large whale	On	Full	1	-	58.981	-149.923	65-66	Inshore
7/15/2013	6:45:28	784	Dall's porpoise	On	Full	3	-	58.997	-149.943	65-66	Inshore
7/15/2013	6:50:20	785	Fin whale	On	Full	13	-	59.008	-149.99	65-66	
7/15/2013	7:00:27	786	Fin whale	On	Full	8	-	59.042	-150.049	65-66	
7/15/2013	11:40:56	787	Northern fur seal	On	Full	1	-	58.967	-149.965	66-67	Inshore
7/15/2013	12:18:36	788	Humpback whale	On	Full	1	-	58.923	-149.835	66-67	Inshore
7/15/2013	12:28:50	789	Unid porpoise	On	Full	1	-	58.908	-149.806	66-67	Inshore
7/15/2013	12:45:51	790	Dall's porpoise	On	Full	2	-	58.87	-149.75	66-67	Inshore
7/15/2013	13:21:29	791	Unid large whale	On	Full	1	-	58.792	-149.58	66-67	Inshore
7/15/2013	14:05:55	792	Dall's porpoise	On	Full	3	-	58.732	-149.532	66-67	Inshore
7/15/2013	14:50:55	793	Dall's porpoise	On	Full	2	-	58.651	-149.427	66-67	Inshore
7/15/2013	17:26:09	794	Fin whale	On	Full	9	-	58.361	-149.061	66-67	Inshore
7/15/2013	17:41:56	795	Fin whale	Off	Full	13	1	58.326	-149.076	66-67	Inshore
7/15/2013	18:12:33	796	Fin whale	On	Full	1	-	58.331	-148.98	66-67	Inshore
7/15/2013	18:23:49	797	Fin whale	On	Full	2	-	58.354	-149.077	67-68	Inshore
7/15/2013	18:27:43	798	Fin whale	On	Full	1	-	58.385	-149.074	67-68	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/15/2013	19:03:09	799	Fin whale	On	Full	1	-	58.419	-149.187	67-68	Inshore
7/15/2013	19:53:57	800	Unid porpoise	On	Full	1	-	58.461	-149.389	67-68	Inshore
7/16/2013	6:03:39	801	Fin whale	On	Fog	1	-	58.38	-149.798	68-69	Inshore
7/16/2013	6:15:25	802	Fin whale	On	Full	2	-	58.361	-149.756	68-69	Inshore
7/16/2013	6:17:33	803	Fin whale	On	Full	1	-	58.358	-149.761	68-69	Inshore
7/16/2013	6:21:47	804	Humpback whale	Off	Full	7	-	58.338	-149.719	68-69	Inshore
7/16/2013	7:23:10	805	Humpback whale	On	Full	2	-	58.269	-149.648	68-69	Inshore
7/16/2013	7:23:56	806	Humpback whale	On	Full	6	-	58.28	-149.612	68-69	Inshore
7/16/2013	7:24:33	807	Humpback whale	On	Full	2	-	58.258	-149.649	68-69	Inshore
7/16/2013	7:24:55	808	Humpback whale	On	Full	10	-	58.275	-149.618	68-69	Inshore
7/16/2013	7:26:27	809	Humpback whale	On	Full	3	-	58.284	-149.645	68-69	Inshore
7/16/2013	7:27:03	810	Humpback whale	On	Full	6	-	58.267	-149.611	68-69	Inshore
7/16/2013	7:28:15	811	Humpback whale	On	Full	2	-	58.282	-149.671	68-69	Inshore
7/16/2013	7:28:57	812	Humpback whale	On	Full	1	-	58.277	-149.697	68-69	Inshore
7/16/2013	7:29:22	813	Humpback whale	On	Full	4	-	58.277	-149.615	68-69	Inshore
7/16/2013	7:29:55	814	Humpback whale	On	Full	4	-	58.272	-149.612	68-69	Inshore
7/16/2013	7:32:09	815	Humpback whale	On	Full	10	-	58.284	-149.63	68-69	Inshore
7/16/2013	7:33:36	816	Humpback whale	On	Full	4	-	58.286	-149.643	68-69	Inshore
7/16/2013	7:35:15	817	Humpback whale	On	Full	2	-	58.28	-149.63	68-69	Inshore
7/16/2013	7:36:00	818	Humpback whale	On	Full	1	-	58.298	-149.729	68-69	Inshore
7/16/2013	7:36:21	819	Humpback whale	On	Full	2	-	58.289	-149.635	68-69	Inshore
7/16/2013	7:39:32	820	Humpback whale	On	Full	15	-	58.307	-149.669	68-69	Inshore
7/16/2013	7:40:28	821	Humpback whale	On	Full	6	-	58.295	-149.657	68-69	Inshore
7/16/2013	7:45:04	822	Humpback whale	On	Full	6	-	58.304	-149.662	68-69	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/16/2013	7:46:04	823	Humpback whale	On	Full	3	-	58.316	-149.675	68-69	Inshore
7/16/2013	7:46:41	824	Humpback whale	On	Full	15	-	58.326	-149.716	68-69	Inshore
7/16/2013	7:47:39	825	Humpback whale	On	Full	8	-	58.319	-149.697	68-69	Inshore
7/16/2013	7:48:29	826	Fin whale	On	Full	6	-	58.322	-149.697	68-69	Inshore
7/16/2013	7:49:31	827	Humpback whale	On	Full	8	-	58.336	-149.696	68-69	Inshore
7/16/2013	7:51:57	828	Fin whale	On	Full	2	-	58.325	-149.657	68-69	Inshore
7/16/2013	7:52:59	829	Humpback whale	On	Full	6	-	58.334	-149.739	68-69	Inshore
7/16/2013	7:55:44	830	Fin whale	On	Full	5	-	58.325	-149.693	68-69	Inshore
7/16/2013	7:56:56	831	Humpback whale	On	Full	4	-	58.334	-149.749	68-69	Inshore
7/16/2013	7:57:28	832	Humpback whale	On	Full	3	-	58.328	-149.695	68-69	Inshore
7/16/2013	7:58:12	833	Humpback whale	On	Full	7	-	58.337	-149.702	68-69	Inshore
7/16/2013	7:59:50	834	Fin whale	On	Full	1	-	58.339	-149.758	68-69	Inshore
7/16/2013	8:01:34	835	Humpback whale	On	Full	5	-	58.333	-149.707	68-69	Inshore
7/16/2013	8:01:47	836	Fin whale	On	Full	2	-	58.333	-149.708	68-69	Inshore
7/16/2013	8:03:14	837	Humpback whale	On	Full	4	-	58.332	-149.738	68-69	Inshore
7/16/2013	8:03:39	838	Humpback whale	On	Full	8	-	58.341	-149.708	68-69	Inshore
7/16/2013	8:04:30	839	Northern fur seal	On	Full	1	-	58.326	-149.71	68-69	Inshore
7/16/2013	8:05:20	840	Fin whale	On	Full	5	-	58.353	-149.752	68-69	Inshore
7/16/2013	8:06:00	841	Fin whale	On	Full	2	-	58.356	-149.669	68-69	Inshore
7/16/2013	8:06:58	842	Humpback whale	On	Full	4	-	58.342	-149.707	68-69	Inshore
7/16/2013	8:09:34	843	Humpback whale	On	Full	4	-	58.335	-149.754	68-69	Inshore
7/16/2013	8:10:59	844	Northern fur seal	On	Full	1	-	58.342	-149.717	68-69	Inshore
7/16/2013	8:11:34	845	Fin whale	On	Full	6	-	58.342	-149.759	68-69	Inshore
7/16/2013	8:13:26	846	Fin whale	On	Full	6	-	58.347	-149.745	68-69	Inshore
7/16/2013	8:15:32	847	Fin whale	On	Full	4	-	58.365	-149.753	68-69	Inshore
7/16/2013	8:17:58	848	Humpback whale	On	Full	3	-	58.361	-149.834	68-69	Inshore
7/16/2013	8:21:54	849	Fin whale	On	Full	4	-	58.368	-149.761	68-69	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/16/2013	9:02:44	850	Fin whale	Off	Full	2	-	58.353	-149.731	68-69	Inshore
7/16/2013	9:22:34	851	Fin whale	Off	Full	6	-	58.334	-149.708	68-69	Inshore
7/16/2013	9:28:30	852	Fin whale	Off	Full	3	-	58.316	-149.713	68-69	Inshore
7/16/2013	9:33:38	853	Northern fur seal	Off	Full	1	-	58.323	-149.738	68-69	Inshore
7/16/2013	9:38:54	854	Humpback whale	Off	Full	10	-	58.334	-149.722	68-69	Inshore
7/16/2013	9:40:23	855	Fin whale	Off	Full	5	-	58.328	-149.644	68-69	Inshore
7/16/2013	9:43:01	964	Fin whale	Off	Full	5	-	58.324	-149.645	68-69	Inshore
7/16/2013	9:44:31	856	Fin whale	Off	Full	5	-	58.315	-149.639	68-69	Inshore
7/16/2013	9:49:22	857	Fin whale	Off	Full	2	-	58.275	-149.636	68-69	Inshore
7/16/2013	10:03:33	858	Fin whale	Off	Full	2	-	58.296	-149.605	68-69	Inshore
7/16/2013	10:08:18	859	Humpback whale	Off	Full	1	-	58.29	-149.648	68-69	Inshore
7/16/2013	10:10:59	860	Fin whale	Off	Full	3	-	58.287	-149.597	68-69	Inshore
7/16/2013	10:12:39	861	Fin whale	Off	Full	1	-	58.272	-149.548	68-69	Inshore
7/16/2013	10:12:44	862	Fin whale	Off	Full	2	-	58.278	-149.57	68-69	Inshore
7/16/2013	10:16:30	863	Fin whale	Off	Full	3	-	58.292	-149.597	68-69	Inshore
7/16/2013	10:19:39	864	Humpback whale	Off	Full	2	-	58.272	-149.614	68-69	Inshore
7/16/2013	10:40:27	865	Humpback whale	On	Full	2	-	58.244	-149.488	68-69	Inshore
7/16/2013	10:41:35	866	Humpback whale	On	Full	3	-	58.256	-149.472	68-69	Inshore
7/16/2013	10:51:25	867	Humpback whale	On	Full	1	-	58.215	-149.527	68-69	Inshore
7/16/2013	10:52:50	868	Humpback whale	On	Full	2	-	58.204	-149.558	68-69	Inshore
7/16/2013	10:53:56	869	Humpback whale	Off	Full	1	-	58.221	-149.536	68-69	Inshore
7/16/2013	10:55:31	870	Fin whale	On	Full	1	-	58.188	-149.479	68-69	Inshore
7/16/2013	11:05:35	871	Humpback whale	On	Full	3	-	58.214	-149.45	68-69	Inshore
7/16/2013	11:22:15	872	Unid large whale	On	Full	1	-	58.14	-149.445	68-69	Inshore
7/16/2013	12:45:56	873	Unid large whale	On	Full	1	-	58.126	-149.578	69-70	Inshore
7/16/2013	12:53:59	874	Unid porpoise	On	Full	1	-	58.151	-149.529	69-70	Inshore
7/16/2013	13:19:54	875	Humpback whale	On	Full	2	-	58.2	-149.631	69-70	Inshore
7/16/2013	13:27:39	876	Unid large whale	On	Full	1	-	58.216	-149.657	69-70	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/16/2013	13:40:28	877	Fin whale	On	Full	1	-	58.188	-149.705	69-70	Inshore
7/16/2013	13:47:26	878	Unid large whale	On	Full	1	-	58.175	-149.768	69-70	Inshore
7/16/2013	13:47:55	879	Unid large whale	On	Full	2	-	58.251	-149.695	69-70	Inshore
7/16/2013	13:51:19	880	Dall's porpoise	On	Full	15	-	58.209	-149.742	69-70	Inshore
7/16/2013	14:34:23	881	Unid large whale	On	Fog	2	-	58.275	-149.997	69-70	Inshore
7/16/2013	14:35:56	882	Unid large whale	On	Fog	1	-	58.278	-149.983	69-70	Inshore
7/16/2013	14:57:08	883	Unid large whale	On	Fog	1	-	58.276	-150.023	69-70	Inshore
7/16/2013	14:59:33	884	Humpback whale	On	Fog	1	-	58.279	-150.035	69-70	Inshore
7/16/2013	15:02:51	885	Killer whale	On	Full	5	-	58.276	-150.044	69-70	Inshore
7/16/2013	15:05:04	886	Humpback whale	On	Full	5	-	58.285	-150.072	69-70	Inshore
7/16/2013	15:52:24	887	Humpback whale	On	Full	6	-	58.351	-150.136	69-70	Inshore
7/16/2013	16:27:48	888	Humpback whale	On	Full	6	-	58.366	-150.345	69-70	Inshore
7/16/2013	16:39:33	889	Unid large whale	On	Full	2	-	58.346	-150.384	69-70	Inshore
7/16/2013	16:46:29	890	Humpback whale	On	Full	7	-	58.377	-150.361	69-70	Inshore
7/16/2013	16:48:52	891	Unid large whale	On	Full	5	-	58.366	-150.411	69-70	Inshore
7/16/2013	16:49:52	892	Humpback whale	On	Full	1	-	58.383	-150.36	69-70	Inshore
7/16/2013	16:50:34	893	Humpback whale	On	Full	2	-	58.402	-150.387	69-70	Inshore
7/16/2013	16:51:30	894	Humpback whale	On	Full	2	-	58.408	-150.374	69-70	Inshore
7/16/2013	16:55:23	895	Humpback whale	On	Full	3	-	58.377	-150.396	69-70	Inshore
7/16/2013	16:56:51	896	Humpback whale	On	Full	2	-	58.382	-150.41	69-70	Inshore
7/16/2013	17:00:42	897	Humpback whale	On	Full	2	-	58.384	-150.435	69-70	Inshore
7/16/2013	17:02:37	898	Humpback whale	On	Full	7	-	58.384	-150.412	69-70	Inshore
7/16/2013	17:06:40	899	Humpback whale	On	Full	2	-	58.391	-150.398	69-70	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/16/2013	17:08:10	900	Humpback whale	On	Full	4	-	58.386	-150.416	69-70	Inshore
7/16/2013	17:10:31	901	Humpback whale	On	Full	2	-	58.396	-150.441	69-70	Inshore
7/16/2013	17:13:45	902	Humpback whale	On	Full	1	-	58.382	-150.446	69-70	Inshore
7/16/2013	17:19:16	903	Humpback whale	On	Full	1	-	58.41	-150.514	69-70	Inshore
7/16/2013	17:19:36	904	Humpback whale	On	Full	2	-	58.38	-150.475	69-70	Inshore
7/16/2013	17:21:32	905	Humpback whale	On	Full	1	-	58.365	-150.498	69-70	Inshore
7/16/2013	17:25:38	906	Northern fur seal	On	Full	1	-	58.4	-150.481	69-70	Inshore
7/16/2013	17:25:45	907	Humpback whale	On	Full	2	-	58.358	-150.517	69-70	Inshore
7/16/2013	17:49:23	908	Northern fur seal	On	Full	2	-	58.425	-150.576	69-70	Inshore
7/16/2013	18:11:33	909	Unid large whale	On	Full	4	-	58.418	-150.704	69-70	Inshore
7/16/2013	18:36:41	910	Unid large whale	On	Full	1	-	58.434	-150.808	69-70	Inshore
7/16/2013	18:54:03	911	Humpback whale	On	Full	3	-	58.416	-150.753	70-71	Inshore
7/16/2013	19:05:22	912	Humpback whale	On	Full	1	-	58.407	-150.776	t70-71	Inshore
7/16/2013	19:06:59	913	Humpback whale	On	Full	2	-	58.412	-150.779	70-71	Inshore
7/16/2013	19:14:59	914	Humpback whale	On	Full	4	-	58.403	-150.741	70-71	Inshore
7/16/2013	19:18:28	915	Dall's porpoise	On	Full	3	-	58.428	-150.708	70-71	Inshore
7/16/2013	19:22:37	916	Humpback whale	On	Full	3	-	58.393	-150.739	70-71	Inshore
7/16/2013	19:27:37	917	Humpback whale	On	Full	2	-	58.375	-150.659	70-71	Inshore
7/16/2013	19:35:14	918	Humpback whale	On	Full	2	-	58.379	-150.672	70-71	Inshore
7/16/2013	19:42:44	919	Unid large whale	On	Full	1	-	58.339	-150.682	70-71	Inshore
7/16/2013	19:45:58	920	Unid large whale	On	Full	3	-	58.381	-150.54	70-71	Inshore
7/16/2013	19:53:26	921	Humpback whale	On	Full	3	-	58.369	-150.5	70-71	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/16/2013	20:09:23	922	Humpback whale	On	Full	3	-	58.331	-150.505	70-71	Inshore
7/16/2013	20:29:03	923	Humpback whale	On	Full	2	-	58.297	-150.522	70-71	Inshore
7/16/2013	20:31:00	924	Humpback whale	On	Full	1	-	58.281	-150.473	70-71	Inshore
7/16/2013	20:32:22	925	Humpback whale	On	Full	1	-	58.334	-150.423	70-71	Inshore
7/16/2013	20:36:41	926	Humpback whale	On	Full	1	-	58.258	-150.521	70-71	Inshore
7/16/2013	20:38:19	927	Unid large whale	On	Full	1	-	58.252	-150.465	70-71	Inshore
7/16/2013	20:43:02	928	Unid porpoise	On	Full	1	-	58.272	-150.475	70-71	Inshore
7/16/2013	20:45:31	929	Unid large whale	On	Full	1	-	58.26	-150.509	70-71	Inshore
7/16/2013	21:35:06	930	Unid large whale	On	Full	1	-	58.159	-150.265	70-71	Inshore
7/16/2013	21:42:37	931	Killer whale	On	Full	4	-	58.192	-150.276	70-71	Inshore
7/17/2013	7:38:51	933	Unid large whale	On	Full	1	-	58.105	-150.93	71-72	Inshore
7/17/2013	7:55:36	934	Humpback whale	On	Full	2	-	58.129	-150.977	71-72	Inshore
7/17/2013	7:57:18	935	Unid large whale	On	Full	1	-	58.152	-150.987	71-72	Inshore
7/17/2013	8:04:54	936	Unid large whale	On	Full	1	-	58.188	-150.949	71-72	Inshore
7/17/2013	8:10:57	937	Humpback whale	On	Full	2	-	58.134	-151.054	71-72	-
7/17/2013	8:11:36	938	Humpback whale	On	Full	1	-	58.127	-151.054	71-72	-
7/17/2013	8:12:53	939	Humpback whale	On	Full	1	-	58.136	-151.078	71-72	-
7/17/2013	8:17:04	940	Humpback whale	On	Full	2	-	58.159	-151.037	71-72	-
7/17/2013	10:19:22	941	Humpback whale	On	Full	2	-	57.91	-150.739	72-73	Inshore
7/17/2013	12:19:15	942	Unid large whale	On	Fog	1	-	57.764	-150.36	72-73	Inshore
7/17/2013	12:29:29	943	Unid large whale	On	Fog	1	-	57.748	-150.322	72-73	Inshore
7/17/2013	12:47:02	944	Unid large whale	On	Fog	1	-	57.698	-150.317	72-73	Inshore
7/17/2013	15:42:09	945	Fin whale	Off	Off	4	-	57.646	-150.432	73-74	Inshore

Date (AKDT)	Time (AKDT)	S #	Species	Status	Type	Size	Calves	LADD	LODD	Track	Stratum
7/17/2013	15:56:47	946	Dall's porpoise	Off	Off	4	-	57.648	-150.427	73-74	Inshore
7/17/2013	18:03:04	947	Northern fur seal	Off	Off	1	-	57.72	-150.887	73-74	Inshore
7/17/2013	20:00:05	948	Dall's porpoise	On	Full	3	-	57.574	-150.808	74-75	Inshore
7/17/2013	20:23:16	949	Fin whale	On	Full	2	-	57.534	-150.753	74-75	Inshore
7/17/2013	20:31:01	950	Fin whale	On	Full	1	-	57.517	-150.709	74-75	Inshore
7/17/2013	21:23:03	951	Unid large whale	On	Fog	1	-	57.439	-150.535	74-75	Inshore
7/18/2013	10:50:29	952	Humpback whale	Off	Off	2	-	56.64	-152.497	75-Kodiak	-
7/18/2013	10:55:11	953	Unid large whale	Off	Off	1	-	56.643	-152.529	75-Kodiak	-
7/18/2013	10:56:06	954	Humpback whale	Off	Off	1	-	56.641	-152.53	75-Kodiak	-
7/18/2013	11:04:14	955	Humpback whale	Off	Off	2	-	56.64	-152.554	75-Kodiak	-
7/18/2013	11:05:20	956	Humpback whale	Off	Off	2	1	56.639	-152.543	75-Kodiak	-
7/18/2013	11:08:33	957	Humpback whale	Off	Off	2	-	56.644	-152.57	75-Kodiak	-
7/18/2013	15:15:08	958	Northern fur seal	Off	Off	1	-	56.769	-152.499	75-Kodiak	--
7/18/2013	20:56:18	959	Humpback whale	Off	Off	1	-	57.177	-152.617	75-Kodiak	-
7/18/2013	21:01:45	960	Humpback whale	Off	Off	2	-	57.179	-152.609	75-Kodiak	-
7/18/2013	21:36:46	961	Unid large whale	Off	Off	1	-	57.212	-152.471	75-Kodiak	-
7/18/2013	21:50:22	962	Unid large whale	Off	Off	2	-	57.258	-152.397	75-Kodiak	-
7/18/2013	21:57:49	963	Gray whale	Off	Off	25	-	57.293	-152.39	75-Kodiak	-

APPENDIX C

Summary Table of Towed Hydrophone Array Acoustic Detections

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APPENDIX C
Summary Table of Towed-Hydrophone Array Acoustic Detections

Key:
AKDT = Alaska daylight time; Visual S# = when acoustic detection could be linked to a visual sighting; LADD = Latitude in decimal degrees; LODD = Longitude in decimal degrees; Beam Dist = distance from vessel at ~90˚ in kilometers; Secondary = species identification in post-processing (pp); UC = unidentified cetacean; (-) Visual S# = no match between acoustics and visual; (-) Beam Dist (km) = no perpendicular distance acquired).

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
6/26/2013	9:54:48	1	131	56.183	-144.015	-	Killer whale	Killer whale	31-30	seamount
6/26/2013	12:15:39	2	142	56.032	-144.027	-	Baird's beaked whale	Baird's beaked whale	31-30	seamount
6/26/2013	17:40:30	3	-	55.887	-143.792	-	Other	Other	30-29	seamount
6/26/2013	17:54:30	4	-	55.911	-143.759	-	UC	Poss killer whale	30-29	seamount
6/26/2013	18:04:30	5	-	55.930	-143.729	-	Sperm whale	Sperm whale	30-29	seamount
6/26/2013	18:45:30	6	-	56.005	-143.611	-	UC	Poss killer whale	30-29	seamount
6/27/2013	7:52:00	7	-	55.588	-142.816	-	UC	Prob killer whale	28-27	seamount
6/27/2013	11:24:55	8	-	55.985	-142.144	-	Other	Other	28-27	seamount
6/27/2013	14:38:36	9	-	56.178	-141.788	-	Sperm whale	Sperm whale	28-27	seamount
6/27/2013	16:06:10	10	-	56.068	-141.782	1.165	Cuvier's beaked whale	Cuvier's beaked whale	27-26	seamount
6/27/2013	17:08:10	11	-	55.934	-141.823	2.5	Cuvier's beaked whale	Cuvier's beaked whale	27-26	seamount
6/27/2013	17:16:10	12	-	55.909	-141.830	-	UC	UC	27-26	seamount
6/27/2013	22:43:10	13	-	55.271	-141.881	-	Other	Other	26-25	seamount
6/27/2013	23:54:10	14	-	55.409	-141.822	-	Sperm whale	Sperm whale	26-25	seamount
6/28/2013	1:18:45	15	-	55.554	-141.759	-	Baird's beaked whale	Baird's beaked whale	26-25	seamount
6/28/2013	3:42:45	16	-	55.804	-141.643	-	Sperm whale	Sperm whale	26-25	seamount
6/28/2013	6:56:01	17	-	55.655	-141.975	-	Sperm whale	Sperm whale	25-24	seamount
6/28/2013	7:34:00	pp	-	56.237	-142.340	0.96	Cuvier's beaked whale	Cuvier's beaked whale	25-24	seamount
6/28/2013	7:45:01	18	-	55.558	-142.124	-	Killer whale	Killer whale	25-24	seamount

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
6/28/2013	8:04:01	19	-	55.492	-142.226	0.25	Killer whale	Killer whale	25-24	seamount
6/28/2013	8:30:01	20	-	55.455	-142.288	3.1	Killer whale	Killer whale	25-24	seamount
6/28/2013	9:42:01	21	-	55.385	-142.439	-	Other	Other	24-23	seamount
6/28/2013	12:21:00	22	168	55.777	-142.400	1.2	Killer whale	Killer whale	24-23	seamount
6/28/2013	14:20:09	23	-	55.888	-142.859	-	Sperm whale	Sperm whale	24-23	seamount
6/28/2013	16:33:37	24	-	56.328	-142.363	-	Killer whale	Killer whale	23-22	seamount
6/29/2013	3:59:53	25	-	56.176	-143.461	-	Killer whale	Killer whale	22-21	seamount
6/29/2013	7:27:53	26	-	56.548	-143.495	1.4	Cuvier's beaked whale	Cuvier's beaked whale	21-20	seamount
6/29/2013	7:47:53	27	-	56.508	-143.557	-	Cuvier's beaked whale	Cuvier's beaked whale	21-20	seamount
6/29/2013	10:58:38	28	-	56.135	-144.133	-	UC	UC	21-20	seamount
6/29/2013	12:00:49	29	-	56.013	-144.316	-	Sperm whale	Sperm whale	21-20	seamount
6/29/2013	13:57:38	30	183	55.917	-144.573	-	Baird's beaked whale	Baird's beaked whale	20-20b	seamount
6/29/2013	16:41:38	31	-	55.997	-144.532	-	Sperm whale	Sperm whale	20-20b	seamount
6/29/2013	21:30:38	32	-	56.428	-144.401	-	Sperm whale	Sperm whale	20b-31	seamount
6/30/2013	8:02:00	33	-	57.621	-143.618	-	Other	Other	5-6	offshore
6/30/2013	8:42:00	34	-	57.719	-143.586	-	UC	UC	5-6	offshore
6/30/2013	9:02:00	35	-	57.773	-143.568	1.43	Other	Other	5-6	offshore
6/30/2013	9:57:00	36	-	57.910	-143.526	-	UC	UC	5-6	offshore
6/30/2013	9:57:00	37	-	57.909	-143.527	-	Sperm whale	Sperm whale	5-6	offshore
6/30/2013	10:58:00	38	-	58.035	-143.484	1.1	Sperm whale	Sperm whale	5-6	offshore
6/30/2013	11:36:00	39	-	58.141	-143.451	-	Sperm whale	Sperm whale	5-6	offshore
6/30/2013	13:49:00	40	-	57.959	-143.723	-	Sperm whale	Sperm whale	6-7	offshore
6/30/2013	14:14:00	41	-	57.913	-143.785	-	Sperm whale	Sperm whale	6-7	offshore
6/30/2013	14:59:00	42	-	57.827	-143.895	6.9	*Stejneger's beaked whale	*Stejneger's beaked whale	6-7	offshore
6/30/2013	15:06:00	43	-	57.814	-143.912	-	UC	Prob killer whale	6-7	offshore
6/30/2013	16:02:00	44	-	57.713	-144.039	-	Other	Other	6-7	offshore
6/30/2013	17:02:00	45	-	57.588	-144.180	-	Other	Other	6-7	offshore
6/30/2013	17:03:00	46	-	57.586	-144.182	-	Sperm whale	Sperm whale	6-7	offshore
7/1/2013	3:25:02	47	-	57.484	-144.847	-	Baird's beaked whale	Baird's beaked whale	7-8	offshore

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
7/1/2013	5:10:26	48	-	57.707	-144.773	8.1	Sperm whale	Sperm whale	7-8	offshore
7/1/2013	5:37:23	49	-	57.755	-144.761	-	UC	Prob killer whale	7-8	offshore
7/1/2013	6:08:46	50	-	57.836	-144.730	-	Sperm whale	Sperm whale	7-8	offshore
7/1/2013	7:46:50	51	-	58.088	-144.658	9.5	Sperm whale	Sperm whale	7-8	offshore
7/1/2013	7:54:34	52	-	58.111	-144.650	-	Sperm whale	Sperm whale	7-8	offshore
7/1/2013	8:05:42	53	-	58.145	-144.638	-	Sperm whale	Sperm whale	7-8	offshore
7/1/2013	8:40:13	54	-	58.252	-144.610	3.5	Sperm whale	Sperm whale	7-8	offshore
7/1/2013	9:45:30	55	-	58.389	-144.531	9.15	Sperm whale	Sperm whale	7-8	offshore
7/1/2013	10:25:38	56	-	58.493	-144.530	11.6	Sperm whale	Sperm whale	7-8	offshore
7/1/2013	11:48:38	57	-	58.106	-144.422	-	Sperm whale	Sperm whale	7-8	offshore
7/1/2013	12:33:34	58	-	58.329	-144.789	2.5	Sperm whale	Sperm whale	8-9	offshore
7/1/2013	13:58:34	59	-	58.161	-144.979	3.7	Sperm whale	Sperm whale	8-9	offshore
7/1/2013	14:39:00	60	-	58.081	-145.071	3.8	Sperm whale	Sperm whale	8-9	offshore
7/1/2013	14:44:47	61	-	58.072	-145.082	4.2	Sperm whale	Sperm whale	8-9	offshore
7/1/2013	15:01:11	62	-	58.039	-145.124	2.5	Sperm whale	Sperm whale	8-9	offshore
7/1/2013	15:40:28	63	-	57.968	-145.208	3.8	Sperm whale	Sperm whale	8-9	offshore
7/1/2013	15:56:41	64	-	57.940	-145.263	1.2	Cuvier's beaked whale	Cuvier's beaked whale	8-9	offshore
7/1/2013	17:24:27	65	-	57.788	-145.428	-	Cuvier's beaked whale	Cuvier's beaked whale	8-9	offshore
7/1/2013	17:40:32	66	-	57.758	-145.464	-	UC	Prob Killer whale	8-9	offshore
7/1/2013	19:32:22	67	-	57.598	-145.640	-	Sperm whale	Sperm whale	8-9	offshore
7/1/2013	20:02:17	68	-	57.563	-145.676	-	Sperm whale	Sperm whale	8-9	offshore
7/1/2013	21:52:40	69	-	57.416	-145.834	-	Sperm whale	Sperm whale	8-9	offshore
7/1/2013	22:29:59	70	-	57.353	-145.906	-	Sperm whale	Sperm whale	8-9	offshore
7/1/2013	23:45:25	71	-	57.223	-146.075	-	Cuvier's beaked whale	Cuvier's beaked whale	8-9	offshore
7/2/2013	4:39:42	72	-	57.631	-145.990	-	Cuvier's beaked whale	Cuvier's beaked whale	9-10	offshore
7/2/2013	5:52:35	73	-	57.777	-145.958	2.5	Cuvier's beaked whale	Cuvier's beaked whale	9-10	offshore
7/2/2013	6:13:12	74	-	57.828	-145.942	-	Sperm whale	Sperm whale	9-10	offshore

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
7/2/2013	6:48:19	75	-	57.918	-145.905	3.4	Cuvier's beaked whale	Cuvier's beaked whale	9-10	offshore
7/2/2013	7:33:50	76	-	58.033	-145.866	1.3	Cuvier's beaked whale	Cuvier's beaked whale	9-10	offshore
7/2/2013	7:54:06	77	-	58.089	-145.849		Sperm whale	Sperm whale	9-10	offshore
7/2/2013	8:05:10	78	-	58.117	-145.841	1.1	Cuvier's beaked whale	Cuvier's beaked whale	9-10	offshore
7/2/2013	8:06:33	79	-	58.119	-145.841	1.8	Cuvier's beaked whale	Cuvier's beaked whale	9-10	offshore
7/2/2013	8:50:42	80	-	58.234	-145.810	-	Sperm whale	Sperm whale	9-10	offshore
7/2/2013	10:53:20	81	-	57.421	-146.073	15	Sperm whale	Sperm whale	9-10	offshore
7/2/2013	10:54:20	82	-	57.423	-146.072	8.4	Killer whale	Killer whale	9-10	offshore
7/2/2013	11:35:28	83	-	58.644	-145.685	1.8	Sperm whale	Sperm whale	9-10	offshore
7/2/2013	11:33:28	84	-	58.639	-145.687	7.3	Sperm whale	Sperm whale	9-10	offshore
7/2/2013	12:34:00	85	-	58.795	-145.620	3.8	Sperm whale	Sperm whale	9-10	offshore
7/2/2013	13:20:43	86	-	58.846	-145.636	6.5	Sperm whale	Sperm whale	9-10	offshore
7/2/2013	13:57:41	87	-	58.774	-145.718	8.3	Sperm whale	Sperm whale	9-10	offshore
7/2/2013	15:08:55	88	-	58.632	-145.887	10.8	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	15:37:55	89	-	58.572	-145.955	7.4	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	15:58:55	90	-	58.528	-146.006	3.5	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	16:10:19	91	-	58.504	-146.036	4.5	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	16:28:03	92	-	58.468	-146.079	4.4	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	17:08:59	93	-	58.384	-146.165	3.6	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	17:32:59	94	-	58.334	-146.222	2.6	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	17:40:00	95	-	58.318	-146.239	2.8	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	18:57:42	96	-	58.162	-146.412	4.4	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	19:23:16	97	-	58.112	-146.468	-	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	19:57:58	98	-	58.043	-146.546	8.85	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	21:11:11	99	-	57.907	-146.998	9.2	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	21:37:11	100	-	57.858	-146.757	8.4	Sperm whale	Sperm whale	10-11	offshore
7/2/2013	22:12:11	101	-	57.801	-146.828	5	Sperm whale	Sperm whale	10-11	offshore
7/3/2013	0:48:12	102	-	57.527	-147.124	-	Sperm whale	Sperm whale	10-11	offshore
7/3/2013	1:28:09	103	-	57.457	-147.202	-	Cuvier's beaked whale	Cuvier's beaked whale	10-11	offshore

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
7/3/2013	2:08:12	104	-	57.378	-147.302	-	Cuvier's beaked whale	Cuvier's beaked whale	11-37	
7/3/2013	2:43:55	105	-	57.318	-147.353	4.3	Cuvier's beaked whale	Cuvier's beaked whale	37-36	seamount
7/3/2013	7:05:56	106	-	56.729	-147.329	10	Sperm whale	Sperm whale	37-36	seamount
7/3/2013	10:24:08	107	-	56.510	-147.159	0.85	Cuvier's beaked whale	Cuvier's beaked whale	36-35	seamount
7/3/2013	10:42:28	108	-	56.546	-147.107	1.09	Cuvier's beaked whale	Cuvier's beaked whale	36-35	seamount
7/3/2013	11:34:45	109	-	56.651	-146.957	6.5	Sperm whale	Sperm whale	36-35	seamount
7/3/2013	11:58:45	110	-	56.699	-146.894	5.5	Sperm whale	Sperm whale	36-35	seamount
7/3/2013	13:21:07	111	-	58.873	-146.639	-	UC	Prob Cuvier's beaked whale	36-35	seamount
7/3/2013	13:26:10	112	272	58.883	-146.619	-	Killer whale	Killer whale	36-35	seamount
7/3/2013	14:22:23	113	-	58.898	-146.628	1.8	Cuvier's beaked whale	Cuvier's beaked whale	36-35	seamount
7/3/2013	14:52:26	114	-	56.955	-146.526	1.13	Cuvier's beaked whale	Cuvier's beaked whale	36-35	seamount
7/3/2013	14:57:26	115	-	56.964	-146.509	2.2	Cuvier's beaked whale	Cuvier's beaked whale	36-35	seamount
7/3/2013	15:29:38	116	-	57.026	-146.418	-	UC	Poss Killer whale	36-35	seamount
7/3/2013	19:28:33	117	-	56.724	-146.215	5.1	*Stejneger's beaked whale	*Stejneger's beaked whale	35-34	seamount
7/3/2013	20:46:42	118	274	56.520	-146.206	-	Sperm whale	Sperm whale	35-34	seamount
7/3/2013	22:47:17	119	-	56.176	-146.206	-	Sperm whale	Sperm whale	35-34	seamount
7/3/2013	23:21:58	120	-	56.244	-146.211	-	Sperm whale	Sperm whale	35-34	seamount
7/4/2013	0:41:21	121	-	56.284	-146.076	-	Cuvier's beaked whale	Cuvier's beaked whale	34-33	seamount
7/4/2013	2:56:07	122	-	56.457	-145.766	3.9	Cuvier's beaked whale	Cuvier's beaked whale	34-33	seamount

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
7/4/2013	3:57:27	123	-	56.559	-145.615	0.9	*Stejneger's beaked whale	*Stejneger's beaked whale	34-33	seamount
7/4/2013	7:34:35	124	-	56.904	-145.090	2.5	Cuvier's beaked whale	Cuvier's beaked whale	33-32	seamount
7/4/2013	11:22:03	125	-	56.407	-145.097	2.2	Cuvier's beaked whale	Cuvier's beaked whale	33-32	seamount
7/4/2013	12:42:38	126	-	56.265	-145.104	-	Cuvier's beaked whale	Cuvier's beaked whale	33-32	seamount
7/4/2013	13:40:04	127	-	56.166	-145.113	2.7	Sperm whale	Sperm whale	33-32	seamount
7/4/2013	14:50:14	128	-	56.038	-145.119	-	Sperm whale	Sperm whale	33-32	seamount
7/4/2013	16:34:59	129	-	56.070	-144.954	1.8	Cuvier's beaked whale	Cuvier's beaked whale	33-32	seamount
7/4/2013	21:44:59	130	-	56.563	-144.543	-	Sperm whale	Sperm whale	20b-19	seamount
7/5/2013	5:10:54	131	-	56.329	-145.274	3.4	UC	Prob Killer whale	19-18	seamount
7/5/2013	9:15:30	132	-	56.323	-145.662	-	UC	Poss killer whale	19-18	seamount
7/5/2013	11:34:58	133	-	56.656	-145.659	4.1	Cuvier's beaked whale	Cuvier's beaked whale	18-17	seamount
7/5/2013	17:27:26	134	-	56.716	-146.164	-	Sperm whale	Sperm whale	17-16	seamount
7/5/2013	17:45:01	135	-	56.688	-146.203	0.8	Cuvier's beaked whale	Cuvier's beaked whale	17-16	seamount
7/5/2013	17:49:01	135 B	-	56.688	-146.203	1.1	Cuvier's beaked whale	Cuvier's beaked whale	17-16	seamount
7/5/2013	19:21:52	136	-	56.532	-146.438	2.95	Offshore Killer whale	Offshore Killer whale	17-16	seamount
7/5/2013	19:47:38	137	-	56.481	-146.513	3	Offshore Killer whale	Offshore Killer whale	17-16	seamount
7/5/2013	20:23:22	138	-	56.418	-146.610	-	Offshore Killer whale	Offshore Killer whale	17-16	seamount
7/5/2013	23:40:30	139	-	56.556	-146.794	6.5	Sperm whale	Sperm whale	16-15	seamount
7/6/2013	4:38:49	140	-	57.148	-146.795	11	Sperm whale	Sperm whale	16-15	seamount
7/6/2013	5:10:04	141	-	57.214	-146.794	5.5	Sperm whale	Sperm whale	16-15	seamount
7/6/2013	5:16:35	142	-	57.227	-146.793	4.4	Sperm whale	Sperm whale	16-15	seamount
7/6/2013	8:03:01	143	-	57.003	-147.166	-	Sperm whale	Sperm whale	15-14	seamount

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
7/6/2013	8:46:47	144	-	56.922	-147.282	-	Sperm whale	Sperm whale	15-14	seamount
7/6/2013	10:25:15	145	-	56.739	-147.544	8.5	Sperm whale	Sperm whale	15-14	seamount
7/6/2013	11:58:23	146	-	56.572	-147.783	3.7	Sperm whale	Sperm whale	15-14	seamount
7/7/2013	4:29:37	147	-	56.670	-148.279	8.6	Sperm whale	Sperm whale	37-38	seamount
7/7/2013	5:18:05	148	-	56.587	-148.379	10.1	Sperm whale	Sperm whale	37-38	seamount
7/7/2013	5:28:22	149	-	56.570	-148.400	-	Sperm whale	Sperm whale	37-38	seamount
7/7/2013	6:01:50	150	-	56.560	-148.448	-	Killer whale	Killer whale	38-39	seamount
7/7/2013	6:37:03	151	-	56.629	-148.450	7	Sperm whale	Sperm whale	38-39	seamount
7/7/2013	6:53:38	152	-	56.663	-148.451	6.7	Sperm whale	Sperm whale	38-39	seamount
7/7/2013	7:20:19	153	-	56.726	-148.452	8	Sperm whale	Sperm whale	38-39	seamount
7/7/2013	7:35:09	154	-	56.762	-148.451	5.8	Sperm whale	Sperm whale	38-39	seamount
7/7/2013	7:50:49	155	-	56.798	-148.452	2.8	Sperm whale	Sperm whale	38-39	seamount
7/7/2013	8:46:53	156	-	56.933	-148.455	4	Sperm whale	Sperm whale	38-39	seamount
7/7/2013	8:57:23	157	-	56.960	-148.456	3.6	Sperm whale	Sperm whale	38-39	seamount
7/7/2013	9:30:21	158	-	57.040	-148.456	2.7	Sperm whale	Sperm whale	38-39	seamount
7/7/2013	9:33:03	159	-	57.047	-148.457	5	Sperm whale	Sperm whale	38-39	seamount
7/7/2013	15:33:17	160	-	57.100	-149.698	7.7	Sperm whale	Sperm whale	non-standard	
7/7/2013	21:43:48	161	-	57.034	-150.551	-	UC	Prob Killer whale	40-41	slope
7/8/2013	0:39:48	162	-	56.893	-149.932	4.9	Sperm whale	Sperm whale	40-41	slope
7/8/2013	2:42:56	163	-	56.927	-149.827		Sperm whale	Sperm whale	41-42	slope
7/8/2013	9:27:17	164	308/309	57.272	-150.099	0.9	Baird's beaked whale	Baird's beaked whale	42-43	slope
7/8/2013	13:05:03	165	-	57.191	-149.908	-	Killer whale	Killer whale	42-43	slope
7/8/2013	15:48:18	166	-	57.011	-149.298	3.3	Sperm whale	Sperm whale	42-43	slope
7/8/2013	16:17:41	167	-	56.961	-149.132	-	Sperm whale	Sperm whale	42-43	slope
7/8/2013	17:00:26	168	-	56.908	-148.960	-	UC	Poss killer whale	42-43	slope
7/8/2013	17:01:48	169	-	56.908	-148.960	7	Sperm whale	Sperm whale	42-43	slope
7/8/2013	17:39:13	170	-	56.857	-148.801	-	Sperm whale	Sperm whale	42-43	slope
7/8/2013	18:02:11	171	-	56.876	-148.810	3.6	Sperm whale	Sperm whale	43-44	slope
7/8/2013	18:18:05	172	-	56.910	-148.869	8.6	Sperm whale	Sperm whale	43-44	slope
7/8/2013	18:41:32	173	-	56.948	-148.936	8	Sperm whale	Sperm whale	43-44	slope
7/8/2013	19:05:39	174	-	56.999	-149.015	16.9	Sperm whale	Sperm whale	43-44	slope
7/8/2013	19:15:31	175	-	57.013	-149.051	11.5	Sperm whale	Sperm whale	43-44	slope
7/8/2013	19:33:04	176	-	57.055	-149.121	8.5	Sperm whale	Sperm whale	43-44	slope
7/8/2013	20:07:12	177	-	57.110	-149.217	6.6	Sperm whale	Sperm whale	43-44	slope

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
7/8/2013	20:47:41	178	-	57.186	-149.349	4	Sperm whale	Sperm whale	43-44	slope
7/8/2013	21:09:19	179	-	57.227	-149.420	5.1	Sperm whale	Sperm whale	43-44	slope
7/8/2013	23:18:31	180	-	57.449	-149.811	-	UC	Prob Stejneger's	43-44	slope
7/9/2013	23:50:51	181	-	57.496	-149.893	-	Sperm whale	Sperm whale	43-44	slope
7/9/2013	1:21:17	182	-	57.592	-150.008	-	Sperm whale	Sperm whale	44-45	slope
7/9/2013	2:38:47	183	-	57.517	-149.782	2.75	Sperm whale	Sperm whale	44-45	slope
7/9/2013	2:43:21	184	-	57.512	-149.767	1.8	Sperm whale	Sperm whale	44-45	slope
7/9/2013	3:15:45	185	-	57.484	-149.666	4.4	Sperm whale	Sperm whale	44-45	slope
7/9/2013	4:18:46	186	-	57.427	-149.476	0.6	Sperm whale	Sperm whale	44-45	slope
7/9/2013	4:28:59	187	-	57.420	-149.447	2.6	Sperm whale	Sperm whale	44-45	slope
7/9/2013	4:42:30	188	-	57.409	-149.403	3.3	Sperm whale	Sperm whale	44-45	slope
7/9/2013	4:45:00	189	-	57.406	-149.393	6.1	Sperm whale	Sperm whale	44-45	slope
7/9/2013	4:48:29	190	-	57.403	-149.384	6.8	Sperm whale	Sperm whale	44-45	slope
7/9/2013	5:05:15	191	-	57.388	-149.331	8	Sperm whale	Sperm whale	44-45	slope
7/9/2013	5:11:33	192	-	57.382	-149.312	3.5	Sperm whale	Sperm whale	44-45	slope
7/9/2013	5:24:52	193	-	57.370	-149.270	1.2	*Stejneger's beaked whale	*Stejneger's beaked whale	44-45	slope
7/9/2013	5:49:14	194	-	57.347	-149.191	6.5	Sperm whale	Sperm whale	44-45	slope
7/9/2013	5:57:14	195	-	57.339	-149.166	0.2	Baird's beaked whale	Baird's beaked whale	44-45	slope
7/9/2013	6:07:15	196	-	57.328	-149.130	9.6	Sperm whale	Sperm whale	44-45	slope
7/9/2013	6:42:55	197	-	57.286	-148.996	8.4	Sperm whale	Sperm whale	44-45	slope
7/9/2013	7:10:58	198	-	57.252	-148.883	4	Sperm whale	Sperm whale	44-45	slope
7/9/2013	7:43:50	199	-	57.212	-148.751	4.7	Sperm whale	Sperm whale	44-45	slope
7/9/2013	8:00:57	200	-	57.192	-148.687	8.5	Sperm whale	Sperm whale	44-45	slope
7/9/2013	8:28:25	201	-	57.157	-148.581	6.1	Sperm whale	Sperm whale	44-45	slope
7/9/2013	9:05:03	202	-	57.114	-148.434	7.3	Sperm whale	Sperm whale	44-45	slope
7/9/2013	9:43:37	203	-	57.159	-148.476	6.4	Sperm whale	Sperm whale	45-46	slope
7/9/2013	9:50:26	204	-	57.171	-148.499	-	Sperm whale	Sperm whale	45-46	slope
7/9/2013	10:17:36	205	-	57.222	-148.590	7.3	Sperm whale	Sperm whale	45-46	slope
7/9/2013	11:49:10	206	-	57.397	-148.906	11.5	Sperm whale	Sperm whale	45-46	slope
7/9/2013	11:53:56	207	-	57.404	-148.906	-	Killer whale	Killer whale	45-46	slope
7/9/2013	12:16:03	208	-	57.448	-148.993	2.5	Sperm whale	Sperm whale	45-46	slope
7/9/2013	11:50:33	209	-	57.399	-148.910	3	Sperm whale	Sperm whale	45-46	slope
7/9/2013	12:35:05	210	-	57.484	-149.055	7.6	Sperm whale	Sperm whale	45-46	slope
7/9/2013	12:44:26	211	-	57.501	-149.085	3.8	Sperm whale	Sperm whale	45-46	slope

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
7/9/2013	13:00:16	212	-	57.526	-149.085	5.5	Sperm whale	Sperm whale	45-46	slope
7/9/2013	13:23:20	213	-	57.575	-149.207	4.5	Sperm whale	Sperm whale	45-46	slope
7/9/2013	13:31:02	214	-	57.590	-149.228	5.9	Sperm whale	Sperm whale	45-46	slope
7/9/2013	13:39:07	215	-	57.605	-149.253	5	Sperm whale	Sperm whale	45-46	slope
7/9/2013	14:10:10	216	-	57.662	-149.351	9.2	Sperm whale	Sperm whale	45-46	slope
7/9/2013	14:17:19	217	337	57.667	-149.383	-	Killer whale	Killer whale	45-46	slope
7/9/2013	15:06:39	218	338	57.681	-149.526	1.2	Killer whale	Killer whale	45-46	slope
7/9/2013	15:41:00	219	343	57.763	-149.579	0.361	Killer whale	Killer whale	45-46	slope
7/9/2013	16:07:39	220	-	57.818	-149.630	0.9	Killer whale	Killer whale	45-46	slope
7/9/2013	16:12:49	221	347	57.830	-149.643	0.35	Killer whale	Killer whale	45-46	slope
7/9/2013	16:20:42	222	346	57.844	-149.667	2.2	Killer whale	Killer whale	45-46	slope
7/9/2013	17:02:53	223	-	57.833	-149.592	-	Killer whale	Killer whale	46-47	slope
7/9/2013	17:59:11	224	-	57.752	-149.336	-	Sperm whale	Sperm whale	46-47	slope
7/9/2013	19:00:50	225	-	57.808	-148.549	-	Sperm whale	Sperm whale	46-47	slope
7/9/2013	19:19:35	226	-	57.677	-149.072	2.7	Sperm whale	Sperm whale	46-47	slope
7/9/2013	19:23:41	227	-	57.671	-149.053	4.4	Sperm whale	Sperm whale	46-47	slope
7/9/2013	19:39:45	228	-	57.655	-148.994	5.3	Sperm whale	Sperm whale	46-47	slope
7/9/2013	19:57:33	229	-	57.636	-148.928	5.7	Sperm whale	Sperm whale	46-47	slope
7/9/2013	20:13:17	230	-	57.618	-148.867	2.7	Sperm whale	Sperm whale	46-47	slope
7/9/2013	21:05:57	231	-	57.595	-148.793	-	UC	Prob killer whale	46-47	slope
7/9/2013	21:58:31	232	-	57.490	-148.451	10.6	Sperm whale	Sperm whale	46-47	slope
7/9/2013	22:01:00	233	-	57.486	-148.438	6.4	Sperm whale	Sperm whale	46-47	slope
7/9/2013	22:43:19	234	359	57.432	-148.267	8.25	Sperm whale	Sperm whale	46-47	slope
7/9/2013	22:54:36	235	-	57.418	-148.221	-	Sperm whale	Sperm whale	46-47	slope
7/9/2013	22:54:36	236	361	57.418	-148.221	-	Sperm whale	Sperm whale	46-47	slope
7/9/2013	22:56:36	237	-	57.417	-148.215	-	Sperm whale	Sperm whale	46-47	slope
7/9/2013	22:56:36	238	-	57.417	-148.215	-	Sperm whale	Sperm whale	46-47	slope
7/9/2013	23:51:54	239	-	57.370	-148.067	-	Sperm whale	Sperm whale	46-47	slope
7/9/2013	23:51:54	240	-	57.370	-148.067	-	Sperm whale	Sperm whale	46-47	slope
7/10/2013	0:33:42	242	-	57.416	-148.112	-	Sperm whale	Sperm whale	47-48	slope
7/10/2013	0:33:42	241	-	57.416	-148.112	3.2	Sperm whale	Sperm whale	47-48	slope
7/10/2013	1:05:35	243	-	57.459	-148.184	9	Sperm whale	Sperm whale	47-48	slope
7/10/2013	2:18:44	244	-	57.562	-148.357	6	Sperm whale	Sperm whale	47-48	slope
7/10/2013	3:17:23	245	-	57.638	-148.495	-	Sperm whale	Sperm whale	47-48	slope
7/10/2013	3:47:32	246	-	57.676	-148.568	0.916	Sperm whale	Sperm whale	47-48	slope
7/10/2013	3:47:32	247	-	57.676	-148.568	4.1	Sperm whale	Sperm whale	47-48	slope

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
7/10/2013	3:47:32	248	-	57.676	-148.568	3.1	Sperm whale	Sperm whale	47-48	slope
7/10/2013	4:20:33	249	-	57.719	-148.649	1.8	Sperm whale	Sperm whale	47-48	slope
7/10/2013	4:46:54	250	-	57.756	-148.714	4.3	Sperm whale	Sperm whale	47-48	slope
7/10/2013	5:03:03	251	-	57.783	-148.755	4.1	Sperm whale	Sperm whale	47-48	slope
7/10/2013	5:05:10	252	-	57.786	-148.760	3.2	Sperm whale	Sperm whale	47-48	slope
7/10/2013	5:20:26	253	-	57.810	-148.797	9.7	Sperm whale	Sperm whale	47-48	slope
7/10/2013	5:46:40	254	-	57.853	-148.864	0.32	Sperm whale	Sperm whale	47-48	slope
7/10/2013	11:22:05	255	-	57.937	-148.769	7.1	Sperm whale	Sperm whale	48-49	slope
7/10/2013	11:50:50	256	-	57.906	-148.646	1.6	Sperm whale	Sperm whale	48-49	slope
7/10/2013	12:07:42	257	367	57.890	-148.569	2.9	Sperm whale	Sperm whale	48-49	slope
7/10/2013	12:31:06	258	368	57.865	-148.466	1.7	Sperm whale	Sperm whale	48-49	slope
7/10/2013	12:35:16	259	-	57.859	-148.449	1.1	Sperm whale	Sperm whale	48-49	slope
7/10/2013	12:53:07	260	369	57.835	-148.379	1	Sperm whale	Sperm whale	48-49	slope
7/10/2013	13:03:08	261	-	57.822	-148.326	5.4	Sperm whale	Sperm whale	48-49	slope
7/10/2013	13:35:00	262	372	57.779	-148.186	6.8	Sperm whale	Sperm whale	48-49	slope
7/10/2013	13:48:00	263	-	57.760	-148.128	7.3	Sperm whale	Sperm whale	48-49	slope
7/10/2013	14:13:00	264	374	57.725	-148.020	4.5	Sperm whale	Sperm whale	48-49	slope
7/10/2013	14:21:00	265	373	57.715	-147.987	0.386	Sperm whale	Sperm whale	48-49	slope
7/10/2013	14:56:00	266	-	57.671	-147.841	3.2	Sperm whale	Sperm whale	48-49	slope
7/10/2013	15:47:00	267	-	57.640	-147.774	6	Sperm whale	Sperm whale	48-49	slope
7/10/2013	17:45:00	268	-	57.731	-147.857	12.1	Sperm whale	Sperm whale	49-50	slope
7/10/2013	18:42:00	269	-	57.819	-148.007	28.45	Sperm whale	Sperm whale	49-50	slope
7/10/2013	18:57:00	270	-	57.846	-148.052	-	Killer whale	Killer whale	49-50	slope
7/10/2013	11:24:15	271	-	58.300	-148.820	-	Sperm whale	Sperm whale	49-50	slope
7/10/2013	11:52:16	272	-	58.335	-148.881	-	UC	Prob killer whale	49-50	slope
7/11/2013	1:06:02	273	-	58.342	-148.827	17.1	Sperm whale	Sperm whale	50-51	slope
7/11/2013	2:47:24	274	-	58.246	-148.522	2.2	Killer whale	Killer whale	50-51	slope
7/11/2013	3:02:41	275	-	58.232	-148.476	0.69	Killer whale	Killer whale	50-51	slope
7/11/2013	3:18:28	276	-	58.216	-148.427	1.7	Killer whale	Killer whale	50-51	slope
7/11/2013	3:19:28	277	-	58.215	-148.424	1.1	Killer whale	Killer whale	50-51	slope
7/11/2013	4:28:37	278	-	58.146	-148.210	7.7	Sperm whale	Sperm whale	50-51	slope
7/11/2013	5:21:41	279	-	58.099	-148.027	-	Killer whale	Killer whale	50-51	slope
7/11/2013	6:06:36	280	-	58.050	-147.861	6.1	Sperm whale	Sperm whale	50-51	slope
7/11/2013	6:13:51	281	-	58.041	-147.832	9.1	Sperm whale	Sperm whale	50-51	slope
7/11/2013	8:03:53	282	397	57.910	-147.423	1.5	Sperm whale	Sperm whale	50-51	slope
7/11/2013	8:08:25	283	402	57.904	-147.402	5.7	Sperm whale	Sperm whale	50-51	slope

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
7/11/2013	8:13:46	284	403	57.897	-147.380	3.9	Sperm whale	Sperm whale	50-51	slope
7/11/2013	8:15:36	285	-	57.894	-147.371	3.4	Sperm whale	Sperm whale	50-51	slope
7/11/2013	8:22:55	286	-	57.885	-147.341	2.6	Sperm whale	Sperm whale	50-51	slope
7/11/2013	8:23:55	287	397	57.883	-147.336	3.1	Sperm whale	Sperm whale	50-51	slope
7/11/2013	8:45:50	288	403	57.863	-147.248	5.6	Sperm whale	Sperm whale	51-52	slope
7/11/2013	9:06:17	289	409	57.900	-147.313	2.4	Sperm whale	Sperm whale	51-52	slope
7/11/2013	9:09:17	290	-	57.906	-147.322	3.2	Sperm whale	Sperm whale	51-52	slope
7/11/2013	9:17:46	291	-	57.910	-147.330	5.5	Sperm whale	Sperm whale	51-52	slope
7/11/2013	9:24:05	292	407	57.932	-147.368	0.46	Sperm whale	Sperm whale	51-52	slope
7/11/2013	9:31:28	293	-	57.945	-147.390	6.7	Sperm whale	Sperm whale	51-52	slope
7/11/2013	12:43:44	294	-	58.183	-147.801	1.2	Sperm whale	Sperm whale	51-52	slope
7/11/2013	13:12:38	295	-	58.236	-147.892	2.8	Baird's beaked whale	Baird's beaked whale	51-52	slope
7/11/2013	13:17:28	296	418	58.245	-147.908	5.8	Baird's beaked whale	Baird's beaked whale	51-52	slope
7/11/2013	13:21:58	297	-	58.252	-147.920	-	Baird's beaked whale	Baird's beaked whale	51-52	slope
7/11/2013	14:23:33	298	-	58.385	-148.149	7.6	Sperm whale	Sperm whale	51-52	slope
7/11/2013	17:49:21	299	-	58.594	-148.436	13.5	Sperm whale	Sperm whale	52-53	slope
7/11/2013	20:31:05	300	-	58.400	-147.787	2.7	Sperm whale	Sperm whale	52-53	slope
7/11/2013	21:57:38	301	-	58.275	-147.413	11.5	Sperm whale	Sperm whale	52-53	slope
7/11/2013	23:43:40	302	-	58.158	-147.041	2.3	Sperm whale	Sperm whale	52-53	slope
7/12/2013	0:58:40	303	-	58.135	-146.914	9.5	Sperm whale	Sperm whale	53-54	slope
7/12/2013	2:26:15	304	-	58.255	-147.118	6.85	Sperm whale	Sperm whale	53-54	slope
7/12/2013	4:19:45	305	-	58.415	-147.377	1.5	*Stejneger's beaked whale	*Stejneger's beaked whale	53-54	slope
7/12/2013	4:54:11	306	-	58.460	-147.459	-	Killer whale	Killer whale	53-54	slope
7/12/2013	4:59:45	307	-	58.469	-147.476	3.6	Sperm whale	Sperm whale	53-54	slope
7/12/2013	5:16:28	308	-	58.494	-147.518	4.2	Sperm whale	Sperm whale	53-54	slope
7/12/2013	5:29:53	309	-	58.513	-147.552	4.6	Sperm whale	Sperm whale	53-54	slope
7/12/2013	5:41:19	310	-	58.532	-147.585	8	Sperm whale	Sperm whale	53-54	slope
7/12/2013	6:21:55	311	-	58.604	-147.703	15.5	Sperm whale	Sperm whale	53-54	slope
7/12/2013	6:46:15	312	-	58.654	-147.782	12	Sperm whale	Sperm whale	53-54	slope
7/12/2013	7:22:55	313	-	58.720	-147.888	6.7	Sperm whale	Sperm whale	53-54	slope
7/12/2013	7:23:32	314	-	58.721	-147.889	12.5	Sperm whale	Sperm whale	53-54	slope
7/12/2013	7:39:46	315	-	58.743	-147.928	7.8	Sperm whale	Sperm whale	53-54	slope

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
7/12/2013	8:38:02	316	-	58.822	-148.067	16.2	Sperm whale	Sperm whale	53-54	slope
7/12/2013	8:41:24	317	-	58.827	-148.074	3.7	Sperm whale	Sperm whale	53-54	slope
7/12/2013	9:27:48	318	-	58.883	-148.154	3.2	Sperm whale	Sperm whale	54-55	slope
7/12/2013	9:42:17	319	-	58.864	-148.098	3.9	Killer whale	Killer whale	54-55	slope
7/12/2013	9:47:29	320	-	58.858	-148.080	3.6	Sperm whale	Sperm whale	54-55	slope
7/12/2013	10:28:44	321	-	58.806	-147.918	9	Sperm whale	Sperm whale	54-55	slope
7/12/2013	10:38:01	322	-	58.792	-147.874	5	Sperm whale	Sperm whale	54-55	slope
7/12/2013	10:47:57	323	-	58.780	-147.835	7.5	Sperm whale	Sperm whale	54-55	slope
7/12/2013	11:26:17	324	-	58.727	-147.669	11.6	Sperm whale	Sperm whale	54-55	slope
7/12/2013	12:02:52	325	-	58.682	-147.524	5	Sperm whale	Sperm whale	54-55	slope
7/12/2013	12:41:29	326	-	58.627	-147.370	7.6	Sperm whale	Sperm whale	54-55	slope
7/12/2013	13:12:10	327	-	58.586	-147.243	6.5	Sperm whale	Sperm whale	54-55	slope
7/12/2013	14:25:44	328	-	58.497	-146.946	9.4	Sperm whale	Sperm whale	54-55	slope
7/12/2013	15:00:28	329	-	58.452	-146.802	7	Sperm whale	Sperm whale	54-55	slope
7/12/2013	15:00:40	330	-	58.452	-146.802	15.5	Sperm whale	Sperm whale	54-55	slope
7/12/2013	15:19:44	331	-	58.426	-146.722	9	Sperm whale	Sperm whale	54-55	slope
7/12/2013	15:43:42	332	-	58.395	-146.618	7.7	Sperm whale	Sperm whale	54-55	slope
7/12/2013	16:55:29	333	-	58.356	-146.502	9.6	Sperm whale	Sperm whale	55-56	slope
7/12/2013	17:09:18	334	-	58.390	-146.562	1.05	Sperm whale	Sperm whale	55-56	slope
7/12/2013	18:44:11	335	463	58.565	-146.835	4.7	Sperm whale	Sperm whale	55-56	slope
7/12/2013	19:56:37	336	467	58.709	-147.070	0.69	Sperm whale	Sperm whale	55-56	slope
7/12/2013	21:13:11	337	470	58.857	-147.320	1.65	Sperm whale	Sperm whale	55-56	slope
7/12/2013	21:40:11	338	470	58.908	-147.404	1.65	Sperm whale	Sperm whale	55-56	slope
7/12/2013	22:21:11	339	-	58.986	-147.535	3.7	Sperm whale	Sperm whale	55-56	slope
7/12/2013	22:24:11	340	-	58.992	-147.546	4.3	Sperm whale	Sperm whale	55-56	slope
7/13/2013	6:20:24	341	-	59.498	-147.922	2.6	*Stejneger's beaked whale	*Stejneger's beaked whale	60-59	inshore
7/13/2013	11:15:56	342	-	59.262	-147.167	3.8	UC	Poss Cuvier's beaked whale	58-57	slope
7/13/2013	17:43:25	343	591	58.610	-146.096	2.3	Cuvier's beaked whale	Cuvier's beaked whale	57-56	slope
7/13/2013	17:59:58	344	-	58.640	-146.162	2.8	Cuvier's beaked whale	Cuvier's beaked whale	57-56	slope

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
7/13/2013	18:19:43	345	-	58.655	-146.247	-	Cuvier's beaked whale	Cuvier's beaked whale	57-56	slope
7/13/2013	22:48:30	346	-	59.014	-147.388	3.45	UC	Prob Stejneger's	57-56	slope
7/13/2013	23:22:23	347	-	59.047	-147.499	5.05	Sperm whale	Sperm whale	57-56	slope
7/14/2013	1:16:44	348	-	59.162	-147.843	5	UC	Prob Stejneger's	61-62	inshore
7/14/2013	1:17:01	349	-	59.163	-147.848	6.8	Killer whale	Killer whale	61-62	inshore
7/14/2013	2:37:53	350	-	59.221	-148.133	2.6	UC	UC	61-62	inshore
7/14/2013	14:44:47	351	661/664	59.073	-148.934	0.25	Unid porpoise	Unid porpoise	63-64	inshore
7/14/2013	23:35:00	352	-	58.636	-148.600	-	Unid porpoise	Unid porpoise	65-66	inshore
7/14/2013	23:35:10	353	-	58.636	-148.600	-	Unid porpoise	Unid porpoise	65-66	inshore
7/14/2013	23:35:20	354	-	58.636	-148.600	-	Unid porpoise	Unid porpoise	65-66	inshore
7/15/2013	1:06:00	355	-	58.705	-148.861	1.100000024	Unid Porpoise	Unid Porpoise	65-66	inshore
7/15/2013	1:08:00	356	-	58.707	-148.867	0.028	Unid Porpoise	Unid Porpoise	65-66	inshore
7/15/2013	1:30:23	357	-	58.722	-148.932	0.075	UC	UC	65-66	inshore
7/15/2013	13:24:23	358	-	58.811	-149.671	-	Unid Porpoise	Unid Porpoise	66-67	inshore
7/15/2013	15:50:23	359	-	58.555	-149.258	-	UC	UC	66-67	inshore
7/15/2013	23:53:28	360	-	58.682	-150.179	0.462	Killer whale	Killer whale	67-68	inshore
7/16/2013	2:10:03	361	-	58.665	-150.270	1	UC	UC	68-69	inshore
7/16/2013	2:21:23	362	-	58.660	-150.247	0.695	UC	UC	68-69	inshore
7/16/2013	2:31:09	363	-	58.636	-150.227		UC	UC	68-69	inshore
7/16/2013	2:32:06	364	-	58.562	-150.116	2.5	Killer whale	Killer whale	68-69	inshore
7/16/2013	5:59:30	365	-	58.394	-149.819	6.2	UC	Prob killer whale	68-69	inshore
7/16/2013	6:33:08	366	-	58.334	-149.719	6	UC	Prob killer whale	68-69	inshore
7/16/2013	9:15:18	367	-	58.343	-149.721	-	Humpback whale	Humpback whale	68-69	inshore
7/16/2013	9:46:18	368	-	58.326	-149.702	-	UC	Prob killer whale	68-69	inshore
7/16/2013	13:41:55	369	-	58.201	-149.698	-	Unid Porpoise	Unid Porpoise	69-70	inshore

Date (AKDT)	Time (AKDT)	Acoustic #	Visual S#	LADD (N)	LODD (W)	Beam Dist (km)	Species	Secondary ID	Track	Stratum
7/16/2013	13:53:11	370	-	58.212	-149.738	-	Unid Porpoise	Unid Porpoise	69-70	inshore
7/16/2013	14:23:01	371	-	58.240	-149.857	-	Unid Porpoise	Unid Porpoise	69-70	inshore
7/16/2013	14:31:00	372	-	58.249	-149.892	3.2	UC	UC	69-70	inshore
7/16/2013	15:05:57	373	-	58.278	-150.021		Killer whale	Killer whale	69-70	inshore
7/16/2013	16:53:14	374	-	58.366	-150.350	1.05	UC	UC	69-70	inshore
7/16/2013	19:21:00	375	915	58.425	-150.702	0.031	Dall's Porpoise	Dall's Porpoise	70-71	inshore
7/16/2013	19:51:15	376	-	58.376	-150.614	0.387	UC	UC	70-71	inshore
7/16/2013	21:47:22	377	931	58.183	-150.280	-	Killer whale	Killer whale	70-71	inshore
7/16/2013	22:38:00	378	932	58.175	-150.303	0.941	Dall's Porpoise	Dall's Porpoise	70-71	inshore
7/16/2013	23:17:54	379	-	58.118	-150.188	0.268	Unid Porpoise	Unid Porpoise	70-71	inshore
7/17/2013	4:28:35	380	-	57.937	-150.126	5.2	UC	Prob killer whale	71-72	inshore
7/17/2013	6:30:12	381	-	58.050	-150.558	0.6	UC	Prob killer whale	71-72	inshore
7/17/2013	7:45:52	382	-	58.114	-150.867	3.2	UC	Prob killer whale	71-72	inshore
7/17/2013	16:00:00	383	-	58.647	-150.434	-	Unid Porpoise	Unid Porpoise	73-74	inshore
7/17/2013	20:02:00	384	948	57.576	-150.810	-	Dall's Porpoise	Dall's Porpoise	73-74	inshore
7/17/2013	23:42:00	385	-	57.330	-150.808	-	Unid Porpoise	Unid Porpoise	75-76	inshore

APPENDIX D

List of Sonobuoy Deployments and Species Detected

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APPENDIX D
List of Sonobuoy Deployments and Species Detected

Key:
AKDT = Alaska daylight time; LADD = Latitude in decimal degrees; LODD = Longitude in decimal degrees; 0 = not detected; 1 = detected; 2 = possible

Date (AKDT)	Time (AKDT)	LADD (N)	LODD (W)	Right whale	Humpback whale	Fin whale	Killer whale	Sperm whale	Blue whale	Sei whale	Unid cetacean
6/24/2013	13:53:58	56.276	-141.653	0	0	1	0	0	0	0	0
6/24/2013	20:28:19	57.162	-141.413	0	0	0	0	0	0	0	0
6/24/2013	20:37:45	57.190	-141.406	0	0	0	0	0	0	0	0
6/24/2013	22:31:04	57.450	-141.336	0	0	0	0	0	0	0	0
6/25/2013	4:02:47	57.110	-141.812	0	1	0	0	0	0	0	0
6/25/2013	6:56:03	56.773	-142.317	0	0	0	0	0	0	1	0
6/25/2013	10:13:30	56.444	-142.786	0	0	1	0	0	0	0	0
6/25/2013	12:58:43	56.843	-142.673	0	0	0	0	0	0	0	0
6/25/2013	16:14:23	57.347	-142.517	0	0	0	0	0	0	0	0
6/25/2013	19:08:13	57.741	-142.404	0	0	0	0	0	0	0	0
6/25/2013	22:01:31	57.552	-142.768	0	0	0	0	0	0	0	0
6/26/2013	0:58:39	57.286	-143.115	0	0	0	0	0	0	0	0
6/26/2013	4:12:28	56.988	-143.490	0	0	1	0	0	0	0	0
6/26/2013	9:03:15	56.480	-143.991	0	0	1	1	2	0	0	0
6/26/2013	12:27:05	56.053	-144.028	0	0	0	0	2	0	0	0
6/26/2013	17:01:44	55.826	-143.902	0	0	0	0	0	0	0	0
6/26/2013	20:12:11	56.162	-143.365	0	0	0	0	0	0	0	0
6/26/2013	23:13:40	56.414	-142.882	0	0	0	0	0	0	0	0
6/27/2013	4:19:51	55.827	-142.946	0	0	0	0	0	0	0	0
6/27/2013	7:00:00	55.502	-142.953	0	0	0	2	0	0	0	0
6/27/2013	10:32:26	55.857	-142.372	0	0	1	0	0	2	0	0
6/27/2013	14:15:15	56.154	-141.901	0	0	1	0	0	0	0	0
6/27/2013	17:03:39	55.938	-141.822	0	0	1	0	0	0	0	0
6/27/2013	20:16:20	55.518	-141.820	0	0	1	0	0	0	0	0
6/27/2013	23:02:09	55.309	-141.865	0	0	1	0	0	0	0	0
6/28/2013	4:23:57	55.853	-141.625	0	0	0	2	1	0	0	0
6/28/2013	8:10:29	55.515	-142.193	0	0	0	1	1	0	0	0
6/28/2013	11:18:50	55.633	-142.416	0	0	0	1	1	0	0	0
6/28/2013	14:00:00	56.012	-142.378	0	2	1	1	1	1	0	0
6/28/2013	17:05:24	56.262	-142.459	0	0	0	1	0	0	0	0
6/28/2013	20:10:12	55.932	-142.991	0	1	0	0	0	0	0	0
6/28/2013	23:07:07	55.644	-143.441	0	1	1	2	1	0	0	0
6/29/2013	4:07:36	56.188	-143.461	0	0	1	1	1	0	0	0
6/29/2013	7:26:27	56.550	-143.492	0	0	1	0	0	0	0	1
6/29/2013	10:54:46	56.142	-144.122	0	1	0	0	1	0	0	1
6/29/2013	20:11:15	56.261	-144.550	0	0	0	0	1	0	0	0

Date (AKDT)	Time (AKDT)	LADD (N)	LODD (W)	Right whale	Humpback whale	Fin whale	Killer whale	Sperm whale	Blue whale	Sei whale	Unid cetacean
6/29/2013	22:55:00	56.585	-144.164	0	0	1	0	1	0	0	0
6/30/2013	4:18:41	57.106	-143.764	0	0	1	0	0	0	0	0
6/30/2013	8:29:24	57.685	-143.597	0	0	1	0	1	0	0	1
6/30/2013	10:55:34	58.032	-143.485	0	0	1	1	1	0	0	0
6/30/2013	13:58:19	57.943	-143.745	0	1	1	1	1	0	0	0
6/30/2013	17:02:00	57.588	-144.179	0	0	1	0	1	0	1	0
6/30/2013	20:09:36	57.211	-144.648	0	0	2	1	1	0	1	0
6/30/2013	23:01:34	56.976	-145.000	0	0	1	0	1	0	0	0
7/1/2013	4:08:48	57.573	-144.817	0	0	0	2	1	0	0	0
7/1/2013	9:06:29	58.301	-144.596	0	0	1	1	1	0	0	0
7/1/2013	12:05:30	58.391	-144.716	0	0	0	0	1	0	0	0
7/1/2013	14:01:32	58.155	-144.987	0	0	1	0	1	0	0	0
7/1/2013	17:09:20	57.811	-145.401	0	0	2	0	1	0	0	0
7/1/2013	20:06:05	57.558	-145.681	0	0	0	2	1	0	0	0
7/1/2013	23:02:00	57.298	-145.974	0	0	1	0	1	0	0	0
7/2/2013	4:24:24	57.604	-146.008	0	2	1	0	1	0	0	0
7/2/2013	8:23:12	58.164	-145.830	0	0	1	0	1	0	0	0
7/2/2013	11:24:22	58.615	-145.697	0	0	0	0	1	0	0	0
7/2/2013	14:11:50	58.745	-145.750	0	0	0	0	1	0	0	0
7/2/2013	17:06:46	58.387	-146.162	0	0	0	0	1	0	0	0
7/2/2013	20:02:21	58.039	-146.552	0	0	0	0	1	0	0	0
7/2/2013	23:05:16	57.713	-147.917	0	0	0	2	1	0	0	0
7/3/2013	4:12:02	57.118	-147.345	0	0	1	0	1	0	0	0
7/3/2013	8:01:00	56.602	-147.320	0	1	0	0	0	0	0	0
7/3/2013	11:09:52	56.603	-147.025	0	0	1	0	1	0	0	0
7/3/2013	14:16:02	56.885	-146.641	0	0	0	1	0	0	0	0
7/3/2013	17:05:20	57.083	-146.216	0	0	0	0	0	0	0	0
7/3/2013	20:09:30	56.609	-146.206	0	0	0	0	0	0	0	0
7/3/2013	23:03:00	56.281	-146.209	0	0	0	0	1	0	0	0
7/4/2013	4:07:19	56.606	-145.586	0	0	1	0	0	0	0	0
7/4/2013	8:09:00	56.821	-145.091	0	0	0	0	0	0	0	0
7/4/2013	11:00:03	56.444	-145.094	0	0	1	0	0	0	0	0
7/4/2013	14:13:36	56.103	-145.119	0	0	0	0	0	0	0	0
7/4/2013	17:24:05	56.100	-144.908	0	0	0	0	2	0	0	0
7/4/2013	20:11:57	56.349	-144.557	0	0	0	0	1	0	0	0
7/4/2013	23:00:32	56.694	-144.541	0	0	1	0	0	0	0	0
7/5/2013	4:10:08	56.422	-145.134	0	0	1	0	0	0	0	0
7/5/2013	8:05:49	56.148	-145.665	0	0	0	0	1	0	0	0
7/5/2013	11:02:50	56.587	-145.656	0	0	1	0	0	1	1	0
7/5/2013	14:11:15	57.039	-145.668	0	0	0	0	0	0	0	0
7/5/2013	16:59:15	56.765	-146.092	0	0	1	2	0	0	0	0
7/5/2013	20:25:33	56.416	-146.614	0	0	0	2	0	0	0	0
7/5/2013	23:03:44	56.477	-146.799	0	0	1	0	1	0	1	0
7/6/2013	4:20:17	57.112	-146.796	0	0	1	1	1	0	0	0

Date (AKDT)	Time (AKDT)	LADD (N)	LODD (W)	Right whale	Humpback whale	Fin whale	Killer whale	Sperm whale	Blue whale	Sei whale	Unid cetacean
7/6/2013	8:00:00	57.006	-147.163	0	1	0	0	1	0	0	0
7/6/2013	11:04:56	56.672	-147.639	0	0	1	1	1	1	0	0
7/6/2013	14:04:20	56.732	-147.881	0	0	1	0	1	0	0	0
7/6/2013	17:03:53	57.171	-147.893	0	0	1	0	0	0	0	0
7/6/2013	20:06:10	57.401	-147.554	0	0	0	0	0	0	0	0
7/6/2013	23:13:54	57.156	-147.636	0	0	0	0	0	0	0	0
7/7/2013	4:25:54	56.675	-148.273	0	0	1	1	1	0	1	0
7/7/2013	8:03:56	56.831	-148.453	0	0	0	0	1	0	0	0
7/7/2013	13:11:56	57.071	-149.239	0	0	0	1	1	0	0	0
7/7/2013	17:19:10	57.086	-150.091	0	0	0	0	1	0	0	0
7/7/2013	20:07:10	57.093	-150.694	0	0	0	0	0	0	0	0
7/7/2013	23:08:02	56.963	-150.230	0	0	0	0	1	0	0	0
7/8/2013	4:12:22	57.054	-150.040	0	0	0	0	1	0	0	0
7/8/2013	8:07:10	57.283	-150.206	0	0	0	0	0	0	0	0
7/8/2013	13:56:58	57.128	-149.698	0	2	1	0	1	0	0	0
7/8/2013	17:04:14	56.902	-148.942	0	0	0	0	0	0	0	0
7/8/2013	20:02:59	57.102	-149.203	0	0	0	0	1	0	0	0
7/8/2013	23:03:41	57.425	-149.769	0	0	0	0	1	0	0	0
7/9/2013	4:16:15	57.429	-149.482	0	0	0	0	1	0	0	0
7/9/2013	8:04:20	57.188	-148.673	0	2	0	0	1	0	0	0
7/9/2013	11:04:34	57.315	-148.752	0	0	1	1	1	0	0	0
7/9/2013	14:03:34	57.650	-149.331	0	0	0	1	1	0	0	0
7/9/2013	17:04:17	57.830	-149.584	0	0	1	0	1	0	0	0
7/9/2013	20:00:41	57.632	-148.914	0	0	1	0	1	0	0	0
7/9/2013	23:17:11	57.407	-148.181	0	0	1	0	1	0	0	0
7/10/2013	4:09:17	57.705	-148.623	0	0	1	0	1	0	1	0
7/10/2013	8:06:16	58.009	-149.274	0	0	0	2	1	0	1	0
7/10/2013	11:17:49	57.942	-148.787	0	0	1	0	1	0	1	0
7/10/2013	14:01:09	57.742	-148.071	0	0	0	0	1	0	0	0
7/10/2013	17:03:05	57.655	-147.721	0	0	1	0	1	0	0	0
7/10/2013	20:04:14	57.961	-148.251	0	0	1	0	1	0	0	0
7/10/2013	23:09:18	58.280	-148.784	0	0	1	1	1	0	0	0
7/11/2013	4:32:17	58.142	-148.194	0	0	1	1	1	0	1	0
7/11/2013	8:00:15	57.913	-147.434	0	0	0	0	1	0	1	0
7/11/2013	11:03:25	58.110	-147.690	0	0	1	1	1	0	0	0
7/11/2013	14:17:39	58.358	-148.099	0	0	0	1	0	0	0	0
7/11/2013	15:04:00	58.413	-148.199	0	0	0	1	1	0	0	0
7/11/2013	15:49:24	58.500	-148.383	0	0	1	1	1	0	0	0
7/11/2013	20:21:44	58.408	-148.824	0	0	0	2	0	0	1	0
7/11/2013	22:59:13	58.201	-147.183	0	0	0	0	0	0	0	0
7/12/2013	4:11:07	58.405	-147.360	0	2	1	2	1	0	1	0
7/12/2013	8:10:17	58.785	-148.002	0	0	0	0	0	0	0	0
7/12/2013	8:17:53	58.795	-148.020	0	2	1	1	1	0	0	0
7/12/2013	11:39:43	58.711	-147.614	0	0	1	1	1	0	1	0

Date (AKDT)	Time (AKDT)	LADD (N)	LODD (W)	Right whale	Humpback whale	Fin whale	Killer whale	Sperm whale	Blue whale	Sei whale	Unid cetacean
7/12/2013	14:20:29	58.503	-146.965	0	0	2	0	1	0	1	0
7/12/2013	17:07:24	58.387	-146.557	0	0	0	0	0	0	0	0
7/12/2013	20:18:17	58.753	-147.142	0	0	1	0	1	0	1	0
7/12/2013	23:07:07	59.067	-147.675	0	0	1	0	1	0	2	0
7/13/2013	4:20:30	59.552	-148.254	0	1	1	1	1	0	0	0
7/13/2013	9:01:03	59.440	-147.633	0	0	0	1	0	0	0	0
7/13/2013	11:51:57	59.195	-147.041	0	0	0	0	1	0	0	0
7/13/2013	14:31:58	58.887	-146.554	0	0	1	0	1	0	0	0
7/13/2013	17:07:35	58.617	-146.089	0	0	0	0	0	0	0	0
7/13/2013	20:08:16	58.804	-146.718	0	2	1	0	1	0	0	0
7/13/2013	23:06:24	59.031	-147.444	0	2	1	0	1	0	0	0
7/14/2013	4:08:47	59.294	-148.447	0	2	1	1	0	0	0	0
7/14/2013	8:08:49	59.204	-148.604	0	1	1	1	0	0	0	0
7/14/2013	11:04:57	58.915	-148.204	0	2	1	0	0	0	0	0
7/14/2013	14:07:16	59.038	-148.796	0	1	1	1	0	0	0	0
7/14/2013	17:02:08	59.175	-149.396	0	1	1	1	0	0	0	1
7/14/2013	20:08:59	58.885	-148.949	0	1	1	0	0	0	0	0
7/14/2013	21:00:36	58.851	-148.903	0	1	1	0	0	0	0	0
7/14/2013	23:25:57	58.630	-148.576	0	0	1	2	1	0	0	0
7/15/2013	4:16:35	58.846	-149.412	0	1	1	1	0	0	0	0
7/15/2013	11:42:18	58.978	-149.956	0	1	1	0	0	0	0	0
7/15/2013	14:06:55	58.735	-149.554	0	1	0	1	0	0	0	0
7/15/2013	17:07:23	58.429	-149.051	0	0	1	1	0	0	0	0
7/15/2013	20:01:11	58.475	-149.380	0	0	1	0	0	0	0	0
7/15/2013	23:04:18	58.464	-150.033	0	2	1	1	0	0	0	0
7/16/2013	4:23:08	58.497	-150.000	2	1	1	1	0	0	0	0
7/16/2013	4:57:44	58.453	-149.957	2	1	1	1	0	0	0	0
7/16/2013	10:04:36	58.298	-149.657	0	1	1	1	0	0	0	0
7/16/2013	11:42:11	58.140	-149.406	0	1	1	1	0	0	0	0
7/16/2013	14:00:21	58.220	-149.769	0	0	0	0	0	0	0	0
7/16/2013	17:27:27	58.401	-150.422	2	1	1	1	0	0	0	0
7/16/2013	20:15:37	58.335	-150.542	2	1	1	0	0	0	0	0
7/16/2013	23:08:29	58.131	-150.211	0	1	1	1	0	0	1	0
7/17/2013	4:23:59	57.934	-150.113	2	1	1	1	1	0	0	0
7/17/2013	8:09:18	58.137	-150.958	0	1	0	0	0	0	0	0
7/17/2013	11:09:41	57.879	-150.580	0	1	1	1	0	0	0	1
7/17/2013	14:36:57	57.600	-150.213	0	0	1	0	0	0	0	0
7/17/2013	17:10:34	57.687	-150.695	0	0	1	2	0	0	0	0
7/17/2013	20:02:45	57.575	-150.808	2	0	1	0	0	0	0	0
7/17/2013	23:07:48	57.331	-150.679	0	0	1	0	0	0	0	0
7/18/2013	1:58:10	57.217	-151.260	0	1	1	2	2	0	0	0
7/18/2013	4:33:50	57.054	-151.690	0	0	1	0	0	0	0	0
7/18/2013	6:54:47	56.767	-151.893	0	1	1	0	1	0	0	0
7/18/2013	8:53:42	56.609	-152.205	0	0	0	0	0	0	0	0

Date (AKDT)	Time (AKDT)	LADD (N)	LODD (W)	Right whale	Humpback whale	Fin whale	Killer whale	Sperm whale	Blue whale	Sei whale	Unid cetacean
7/18/2013	10:15:57	56.557	-152.518	1	0	0	0	0	0	0	0
7/18/2013	10:49:51	56.638	-152.510	1	1	1	0	0	0	0	0
7/18/2013	11:52:42	56.615	-152.662	1	1	0	1	0	0	0	0
7/18/2013	15:59:30	56.873	-152.486	1	1	0	1	0	0	0	0
7/18/2013	17:23:05	57.007	-152.367	0	1	0	0	0	0	0	0
7/18/2013	20:51:13	57.159	-152.633	0	2	0	1	0	0	0	0

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APPENDIX E
Photo ID of Cetaceans

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APPENDIX E
Photo ID of Cetaceans

Baird's beaked whales

CRCBba26-R-20130629-D25-ABD-0191, RADAR, AQUILA-183,
Bba1 CRCBba26
Photographer: Annie B. Douglas

CRCBba27-L-20130629-BKR-BHW-0041, RADAR, AQUILA-183,
Bba2, CRCBba27
Photographer:Brenda K. Rone

CRCBba27-R-20130629-BKR-BHW-0111, RADAR, AQUILA-183,
Bba2, CRCBba27
Photographer:Brenda K. Rone

CRCBba28-R-20130629-D25-ABD-0154, RADAR, AQUILA-183,
Bba3, CRCBba28
Photographer: Annie B. Douglas

CRCBba29-L-20130629-BKR-BHW-0044, RADAR, AQUILA-183,
Bba4, CRCBba29
Photographer:Brenda K. Rone

CRCBba29-R-20130629-D25-ABD-0145, RADAR, AQUILA-183,
Bba4 (front), 3 (mid), 1 (back), CRCBba29
Photographer: Annie B. Douglas

CRCBba30-R-20130708-RW1-EVM-0128, RADAR-AQUILA-308, Bba1, CRCBba30
Photographer: Ernesto Vázquez Morquecho

CRCBba31-R-20130708-RW1-EVM-0053, RADAR-AQUILA-308, Bba2, CRCBba31
Photographer: Ernesto Vázquez Morquecho

CRCBba32-R-20130708-RW1-EVM-0043, RADAR-AQUILA-308, Bba3, CRCBba32
Photographer: Ernesto Vázquez Morquecho

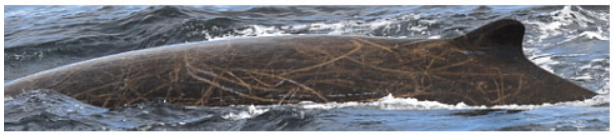
CRCBba33-R-20130708-RW1-EVM-0036, RADAR-AQUILA-308, Bba4, CRCBba33
Photographer: Ernesto Vázquez Morquecho

CRCBba34-L-20130708-RW1-EVM-0287, RADAR-AQUILA-310, Bba6 CRCBba34
Photographer: Ernesto Vázquez Morquecho

CRCBba35-L-20130708-RW1-EVM-0295, RADAR-AQUILA-310, Bba7 CRCBba35
Photographer: Ernesto Vázquez Morquecho

CRCBba35-R-20130708-RW1-EVM-0144, RADAR-AQUILA-308, Bba10, CRCBba35
Photographer: Ernesto Vázquez Morquecho

CRCBba36-L-20130708-RW1-EVM-0303, RADAR-AQUILA-310, Bba8 CRCBba36
Photographer: Ernesto Vázquez Morquecho



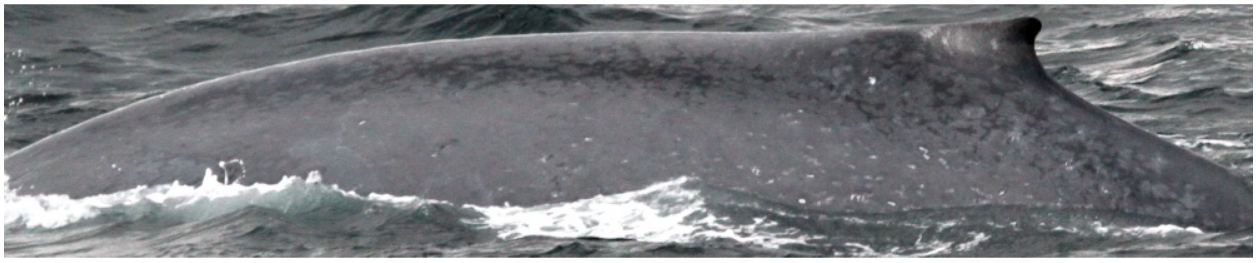
CRCBba37-L-20130708-RW1-EVM-0309, RADAR-AQUILA-310, Bba9 CRCBba37
Photographer: Ernesto Vázquez Morquecho

Blue whales

20130626-BKR-0050, AQUILA-145, Bm1, TemplD Bm-2013-559
Photographer:Brenda K. Rone

20130629-D25-ABD-0008, RADAR-1, AQUILA-185, Bm1 CRC 2181
Photographer: Annie B. Douglas

20130629-D25-ABD-0040, RADAR-1, AQUILA-185, Bm1 CRC 2181
Photographer: Annie B. Douglas



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Photographer: Annie B. Douglas

20130704-BKR-0297, AQUILA-278, Bm1 TempID Bm-2013-999
Photographer:Brenda K. Rone

Fin whales

20130630-D25-ABD-0003.JPG, AQUILA-206, Bp1
TempID 01
Photographer: Annie B Douglas

20130708-RW1-EVM-0156.JPG, RADAR-AQUILA-309, Bp1
TempID 02
Photographer: Ernesto Vazquez Morquecho

20130711-MFR-2550.jpg, AQUILA-423, Bp1,
TempID 03
Photographer: Michael Richlen

20130711-D25-0063.JPG, AQUILA-423, Bp3,
TempID 04
Photographer: Bridget H. Watts

20130711-MFR-2625.jpg, AQUILA-423, Bp2,
TempID 05
Photographer: Michael Richlen

20130715-38-JCG-0492.JPG, AQUILA-785, Bp1,
TempID 06
Photographer: Jennifer C. Gatzke

20130715-38-JCG-0540.JPG, AQUILA-785, Bp2,
TempID 07
Photographer: Jennifer C. Gatzke

20130715-D25-BHW-0221.JPG, RADAR-AQUILA-785, Bp8?,
TempID 08
Photographer: Bridget H. Watts

20130715-38-JCG-0562.JPG, AQUILA-785, Bp3,
TempID 09
Photographer: Jennifer C. Gatzke

20130715-MFR-2894.jpg, RADAR-AQUILA-785, Bp7,
TempID 10
Photographer: Michael Richlen

20130715-MFR-2954.jpg, RADAR-AQUILA-785, Bp7,
TempID 10
Photographer: Michael Richlen

20130715-MFR-2902.jpg, RADAR-AQUILA-785, Bp6, hole
TempID 11
Photographer: Michael Richlen

20130715-MFR-3005.jpg, RADAR-AQUILA-785, Bp6, hole
TempID 11
Photographer: Michael Richlen

20130715-D25-BHW-0260.JPG, RADAR-AQUILA-785, Bp1,
TempID 12
Photographer: Bridget H. Watts

20130715-MFR-2940.jpg, RADAR-AQUILA-785, Bp1,
TempID 12
Photographer: Michael Richlen

20130715-38-JCG-0666.JPG, AQUILA-785, Bp4,
TempID 13
Photographer: Jennifer C. Gatzke

20130715-MFR-2969.jpg, RADAR-AQUILA-785, Bp4,
TempID 13
Photographer: Michael Richlen

20130715-D25-BHW-0334.JPG, RADAR-AQUILA-785, Bp8, poss Bp4
TempID 14
Photographer: Bridget H. Watts

20130715-MFR-3026.jpg, RADAR-AQUILA-785, Bp9
TempID 15
Photographer: Michael Richlen

20130716-D25-0020.JPG, AQUILA-836, Bp1,
TempID 16
Photographer: Bridget H. Watts

20130716-BKR-0231.JPG, RADAR-AQUILA-851, Bp4,
TempID 17
Photographer:Brenda K. Rone

20130716-MFR-0159.jpg, AQUILA-851, Bp4,
TempID 17
Photographer: Michael Richlen

20130716-MFR-0161.jpg, AQUILA-851, Bp9,
TempID 18
Photographer: Michael Richlen

20130716-BKR-0192.JPG, RADAR-AQUILA-851, Bp5,
TempID 19
Photographer:Brenda K. Rone

20130716-BKR-0266.JPG, RADAR-3, Bp15,
TempID 20
Photographer:Brenda K. Rone

20130716-BKR-0118.JPG, RADAR-AQUILA-851, Bp6,
TempID 21
Photographer:Brenda K. Rone

20130716-MFR-0199.jpg, AQUILA-851, Bp7,
TempID 22
Photographer: Michael Richlen

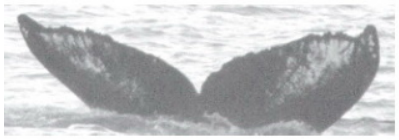
20130716-BKR-0156.JPG, RADAR-AQUILA-851, Bp8,
TempID 23
Photographer:Brenda K. Rone

20130716-D25-0126.JPG, RADAR-AQUILA-851, Bp8,
TempID 23
Photographer: Jennifer C. Gatzke

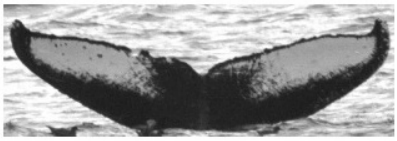
20130716-BKR-0227.JPG, RADAR-AQUILA-851, Bp18,
TempID 24
Photographer:Brenda K. Rone

20130716-BKR-0247.JPG, RADAR-AQUILA-851, Bp19,
TempID 25
Photographer:Brenda K. Rone

Humpback whales



20130716-MFR-0113, AQUILA-843, Mn12,
SPLASH ID 630480
Photographer: Michael Richlen



20130716-MFR-0115, AQUILA-843, Mn11,
TempID Mn-GOALS13-02
Photographer: Michael Richlen

20130716-MFR-0252, AQUILA-854, Mn14,
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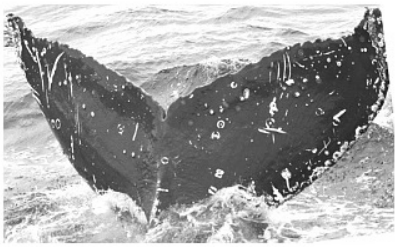
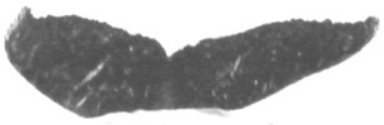
Photographer: Michael Richlen

20130716-MFR-0266, AQUILA-859, Mn15,
TempID Mn-GOALS13-07
Photographer: Michael Richlen

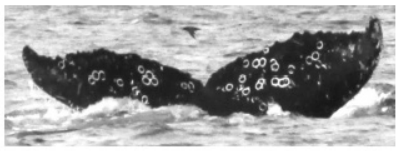


20130716-MFR-0279, AQUILA-864a, Mn16,
TempID Mn-GOALS13-10
Photographer: Michael Richlen

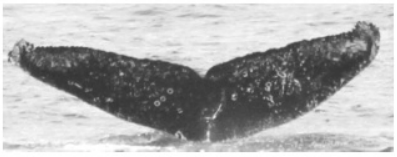
20130716-N38-ABD-0703, AQUILA-854,
Mn13,
TempID Mn-GOALS13-04
Photographer: Annie B. Douglas



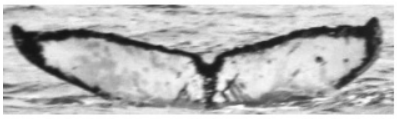
20130716-BKR-0257, RADAR-2, Mn20,
TemplD Mn-GOALS13-09
Photographer:Brenda K. Rone



20130716-BKR-0274, RADAR-4, Mn21,
SPLASH ID 470594
Photographer:Brenda K. Rone



20130716-D25-0004, AQUILA-833, Mn5,
TemplD Mn-GOALS13-06
Photographer: Bridget H. Watts



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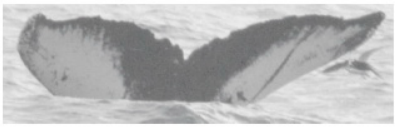
TemplD Mn-GOALS13-11
Photographer: Bridget H. Watts

20130716-D25-0024, AQUILA-833, Mn7,
TemplD Mn-GOALS13-01
Photographer: Bridget H. Watts

20130716-D25-0045, AQUILA-837, Mn8,
entangelment scar
TemplD Mn-GOALS13-13
Photographer: Bridget H. Watts

20130716-MarkDixon-8507, AQUILA-864a,
Mn17,
TemplD Mn-GOALS13-03
Photographer: Mark Dixon

20130716-MFR-0007, AQUILA-810, Mn3,
TemplD Mn-GOALS13-14
Photographer: Michael Richlen



20130716-MFR-0077, AQUILA-838, Mn10,
SPLASH ID 630251
Photographer: Michael Richlen

05OD_16-Aug-05_S266_BKR1_87.jpeg, 16-Aug 2005 SPLASH, Oscar Dyson

Photographer: Brenda K. Rone

20130716-MarkDixon-8514.JPG, AQUILA-864a, Mn18, prop scar

Photographer: Mark Dixon

Killer whales

CRC_Oo_TempID 001-20130703-D25-ABD-0055, AQUILA-272, Oo1
TempID 001
Photographer: Annie B Douglas

CRC_Oo_TempID 001-20130703-D25-ABD-0076, AQUILA-272, Oo1
TempID 001
Photographer: Annie B Douglas

CRC_Oo_TempID 002-20130703-D25-ABD-0029, AQUILA-272, Oo2
TempID 002
Photographer: Annie B Douglas

CRC_Oo_TempID 002-20130703-D25-ABD-0085, AQUILA-272, Oo2
TempID 002
Photographer: Annie B Douglas

CRC_Oo_TempID 003-20130703-D25-ABD-0018, AQUILA-272, Oo3
TempID 003
Photographer: Annie B Douglas

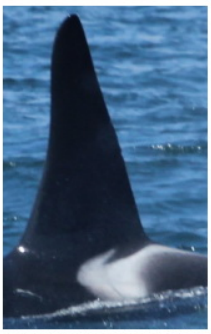
CRC_Oo_TempID 004-20130703-MFR-2263, AQUILA-272, Oo4
TempID 004
Photographer: Michael Richlen

CRC_Oo_TemplD 005-20130703-D25-ABD-0012, AQUILA-272, Oo5
TemplD 005
Photographer: Annie B Douglas

CRC_Oo_TemplD 005-20130703-D25-ABD-0069, AQUILA-272, Oo5
TemplD 005
Photographer: Annie B Douglas

CRC_Oo_TemplD 006-20130703-MFR-2289, AQUILA-272, Oo6
TemplD 006
Photographer: Michael Richlen

CRC_Oo_TemplD 007-20130709-BKR-0106, AQUILA-337, Oo1
TemplD 007
Photographer:Brenda K. Rone



CRC_Oo_TemplD 008-20130709-BHW-7378, AQUILA-337, Oo2
TemplD 008
Photographer: Bridget H. Watts

CRC_Oo_TemplD 009-20130709-BKR-0079, AQUILA-337, Oo3
TemplD 009
Photographer:Brenda K. Rone

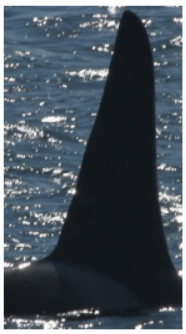
CRC_Oo_TemplD 010-20130709-BHW-7410, AQUILA-337, Oo4
TemplD 010
Photographer: Bridget H. Watts

CRC_Oo_TemplD 011-20130709-BHW-7406, AQUILA-337, Oo5
TemplD 011
Photographer: Bridget H. Watts

CRC_Oo_TemplD 012-20130709-BKR-0152, AQUILA-337, Oo6
TemplD 012
Photographer:Brenda K. Rone

CRC_Oo_TemplD 013-20130716-D25-0192, AQUILA-885, Oo1
TemplD 013
Photographer: Annie B. Douglas

CRC_Oo_TemplD 014-20130716-N37-0125, AQUILA-885, Oo2
TemplD 014
Photographer: Bridget H. Watts



CRC_Oo_TemplD 015-20130709-D25-ABD-0069, AQUILA-341, Oo1
TemplD 015
Photographer: Annie B. Douglas

CRC_Oo_TemplD 016-20130716-N37-0220, AQUILA-931, Oo1
TemplD 016
Photographer: Ernesto Vaquez

CRC_Oo_TemplD 017-20130716-D25-0297, AQUILA-931, Oo2
TemplD 017
Photographer: Bridget H. Watts

CRC_Oo_TemplD 018-20130716-D25-0289, AQUILA-931, Oo3
TemplD 018
Photographer: Bridget H. Watts

CRC_Oo_TemplD 019-20130716-D25-0309, AQUILA-931, Oo4
TemplD 019
Photographer: Bridget H. Watts

Sperm whales

20130711-D25-0006.JPG, AQUILA-408, Pm1
Photographer: Annie B.Douglas

APPENDIX F
Photo ID Results

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APPENDIX F
Photo ID Results

Key:
K = Kodiak, Alaska; PWS = Prince William Sound, Alaska; M = Molokai, Hawai'i; B = Baja California, Mexico).

All fin whales were compared to the following historical catalogs: Cascadia Research Collective (CRC), Great Bear Fjordland British Columbia (GBF), and Department of Fisheries and Oceans (DFO). All humpback whales were compared to the Structures of Population, Levels of Abundance and Status of Humpback Whales (SPLASH), University of Alaska Fairbanks Gulf Apex Predator prey Project (GAP), Humpback whales of Prince William Sound and Kenai Fjords (PWS&KF), and one distinctly scarred whale was matched to a sighting off Baja (Universidad Autónoma de Baja California, UABC). All blue whales were compared to the CRC Eastern Pacific blue whale catalog and the 2011–2012 IWC-POWER cruise catalog. Baird's beaked whales were compared to the CRC and Russian Cetacean Habitat Project/WDC (RCHP) catalogs. All killer whales were compared to the National Marine Mammal Laboratory catalog (NMML) Western Alaska and DFO catalog. The sperm whale was compared to CRC, Southwest Fisheries Science Center (SWFSC) and Southeast Alaska Sperm Whale Avoidance Project (SEASWAP) catalog. "Catalog/NA" denotes that the individual was not compared to specific catalog due to poor quality.

Species	GOALS II Temp ID	Catalog ID	Year First Sighted	Region	Ecotype
Fin	Bp-2013-01	No match			
Fin	Bp-2013-12	No match			
Fin	Bp-2013-14	No match			
Fin	Bp-2013-15	No match, GAP/NA			
Fin	Bp-2013-16	No match			
Fin	Bp-2013-18	No match, GAP/NA			
Fin	Bp-2013-02	No match			
Fin	Bp-2013-22	No match			
Fin	Bp-2013-23	No match			
Fin	Bp-2013-24	No match			
Fin	Bp-2013-25	No match			
Fin	Bp-2013-26	No match			
Fin	Bp-2013-27	No match, GAP/NA			
Fin	Bp-2013-29	No match			
Fin	Bp-2013-31	No match			
Fin	Bp-2013-32	No match, GAP/NA			
Fin	Bp-2013-33	No match, GAP/NA			
Fin	Bp-2013-04	No match, GAP/NA			
Fin	Bp-2013-05	No match			
Fin	Bp-2013-06	No match			

Species	GOALS II Temp ID	Catalog ID	Year First Sighted	Region	Ecotype
Fin	Bp-2013-07	No match, GAP/NA			
Fin	Bp-2013-08	No match			
Fin	Bp-2013-09	No match			
Humpback	Mn-2013-14	No match			
Humpback	Mn-2013-06	No match			
Humpback	Mn-2013-11	No match			
Humpback	Mn-2013-01	GAP/#334	2007	K	
Humpback	Mn-2013-13	GAP/KOD11-0822-1-0189	2011	K	
Humpback	Mn-2013-15	SPLASH/630251	2011	K	
Humpback	Mn-2013-02	PWS&KF/Y125	2003	PWS	
Humpback	Mn-2013-12	SPLASH/630480, GAP/KOD07-0817-2-0084	2006 2007	M K	
Humpback	Mn-2013-04	No match			
Humpback	Mn-2013-08	SPLASH/470756	2004	K	
Humpback	Mn-2013-07	No match			
Humpback	Mn-2013-10	No match			
Humpback	Mn-2013-03	No match			
Humpback	Mn-2013-09	No match			
Humpback	Mn-2013-05	SPLASH/4700594	2004	K	
Humpback	Mn-2013-18	SPLASH/ship strike scars, no ID UABC/ship strike scars, no ID	2005 2013	K B	
Blue	Bm-2013-559	No match			
Blue	Bm-2013-185	CRC/2181	2005	B	
Blue	Bm-2013-572	No match			
Blue	Bm-2013-999	No match			
Baird's	Bba-2013-26	No match			
Baird's	Bba-2013-27	No match			
Baird's	Bba-2013-28	No match			
Baird's	Bba-2013-29	No match			
Baird's	Bba-2013-31	No match			
Baird's	Bba-2013-32	No match			
Baird's	Bba-2013-33	No match			
Baird's	Bba-2013-34	No match			
Baird's	Bba-2013-35	No match			
Baird's	Bba-2013-36	No match			
Baird's	Bba-2013-37	No match			
Killer	Oo-2013-01	No match			
Killer	Oo-2013-02	No match			
Killer	Oo-2013-03	No match			
Killer	Oo-2013-04	No match			

Species	GOALS II Temp ID	Catalog ID	Year First Sighted	Region	Ecotype
Killer	Oo-2013-05	No match			
Killer	Oo-2013-06	No match			
Killer	Oo-2013-07	No match			
Killer	Oo-2013-08	No match			
Killer	Oo-2013-09	No match			
Killer	Oo-2013-10	No match			
Killer	Oo-2013-11	No match			
Killer	Oo-2013-12	No match			
Killer	Oo-2013-13	NMML/WR702	2001	K	Resident
Killer	Oo-2013-14	No match			
Killer	Oo-2013-15	No match			
Killer	Oo-2013-16	No match			
Killer	Oo-2013-17	No match			
Killer	Oo-2013-18	No match			
Killer	Oo-2013-19	No match			
Sperm	Pm-2013-01	No match			

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