

MARINE MAMMAL MONITORING REPORT 2018-2019

Astoria Waterfront Bridge Replacement Project City of Astoria Clatsop County, Oregon

October 2019



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Attachment 1: Marine Mammal Monitoring Data

**MARINE MAMMAL
MONITORING REPORT**

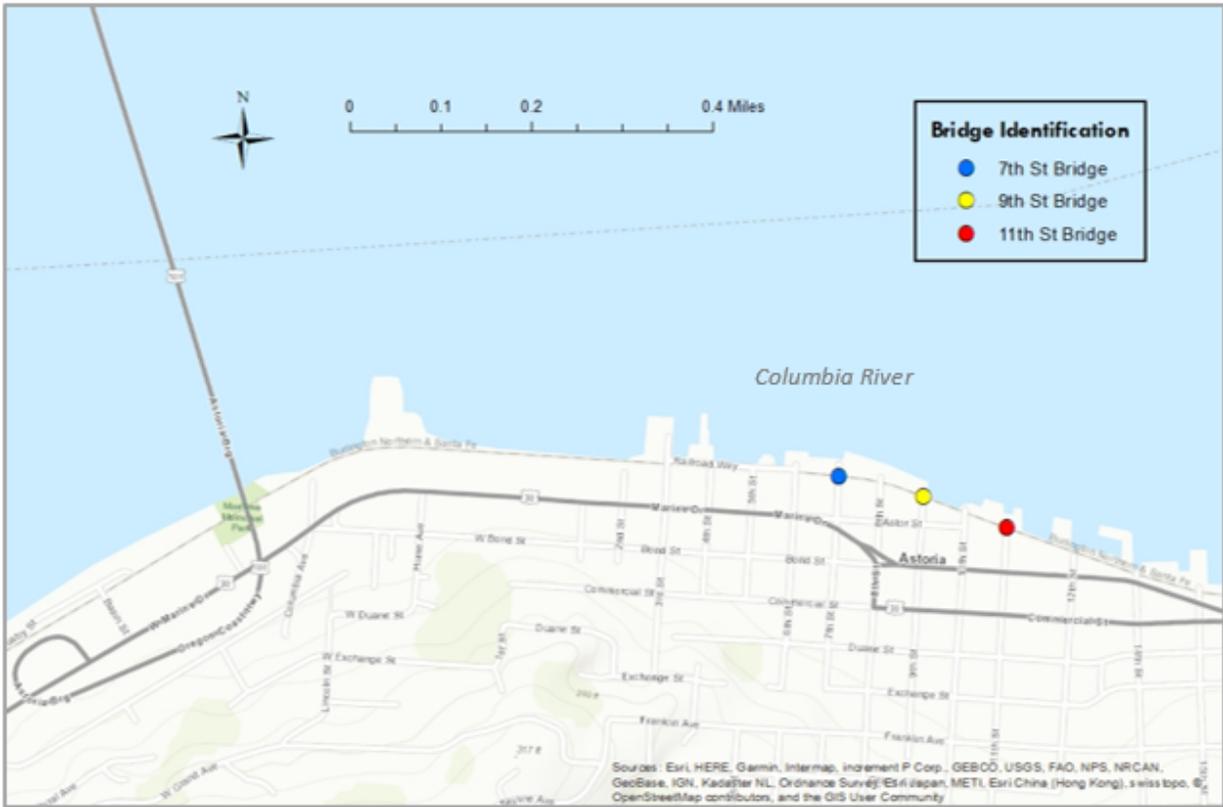
Astoria Waterfront Bridge Replacement Project
City of Astoria, Clatsop County, OR

Introduction

Project Description and Background

The purpose of the Astoria Waterfront Bridge Replacement Project (Project) was to replace the bridges connecting 7th, 9th, and 11th Streets to the Columbia River waterfront (Figure 1). The original bridges, built in 1895, were structurally deficient timber structures supported by decaying timber pile that, due to weight restrictions, severely limited waterfront uses, emergency access, and riverfront redevelopment. The City of Astoria replaced these structurally deficient structures with new concrete bridges that have steel supports and meet current design standards. The new bridges include lighting and wider sidewalks.

Figure 1. Project Location Map



Removal of the existing structures included the demolition of timber substructures, concrete footings, and a retaining wall at 9th Street. All removed materials were hauled offsite to an approved upland location for disposal. In-water work included the removal of previously installed piles using a vibratory hammer and via direct pull. The new support piles were also installed using a vibratory hammer to the extent practicable before an impact hammer was used to seat the pile tips into the bedrock. All construction equipment was operated from the existing roadway and upland areas. Phase 2 of the project

Incidental Harassment Authorization

The City of Astoria sought an Incidental Harassment Authorization (IHA) for the demolition and construction activities which could result in acoustic and visual disturbance to pinnipeds. California sea lions (*Zalophus californianus*) are known to haul-out near several of the crossings, and Steller sea lions (*Eumetopias jubatus*) and harbor seals (*Phoca vitulina richardii*) could be transiting the area during construction. The airborne and in-water sound levels generated by the construction equipment have the potential to exceed the behavioral disruption thresholds for noise.

An IHA issued by the National Marine Fisheries Service (NMFS) on April 11, 2018, authorized the City of Astoria to incidentally harass marine mammals during construction. The species authorized for take were limited to the California sea lion, the Eastern DPS Steller sea lion, and the Pacific harbor seal. The issued IHA was valid from October 1, 2018 to September 30, 2019. A Marine Mammal Monitoring Plan (MMMP) was developed as part of the IHA application; monitoring and reporting in accordance with the MMMP was a condition of the approved IHA.

Marine Mammal Monitoring Methods

All monitoring personnel were trained in species identification and the protocols of the MMMP prior to monitoring construction activities. Monitors included NMFS-qualified Protected Species Observers (PSOs) and Oregon Department of Transportation (ODOT) onsite inspectors.

Monitoring Zones

Under the 1994 Amendments to the Marine Mammal Protection Act (MMPA), there are two levels of marine mammal harassment. Each construction activity had two monitoring zones corresponding to these harassment levels. Level A Shutdown Zones were those areas where construction noise had the potential to injure marine mammals present in the zone. Level B Monitoring Zones were those areas where construction noise had the potential to disturb but not injure marine mammals. The limits of these zones were calculated based on sound levels produced by each construction activity, the physics of sound travel in water and in air, and the sensitivity of each marine mammal species to sound (see Table 1). For details on how the size of these zones were calculated, refer to the Request for MMPA IHA application submitted October 2017 and revised January 2018.

Table 1 – Shutdown and Monitoring Zones by Activity

Activity	Level A Shutdown Zone	Level B Monitoring Zone
Impact Pile Driving	55 meters (seals) 10 meters (sea lions)	398 meters
Vibratory Pile Install/Removal*	15 meters	1600 meters
Other IWW	10 meters	N/A
Above Water Construction Activities	10 meters	28 meters (harbor seals) 9 meters (sea lions)

*Includes the removal of existing timber piles, the installation and removal of temporary casings, site preparation activities, and the installation of permanent steel piles.

Level A Shutdown Zones

ODOT inspectors were responsible for monitoring these zones during all in-water and over-water activities. Additionally, PSOs monitored these zones when visible from their observation points. Monitoring occurred continuously during in-water work activities. If a marine mammal was sighted within or approaching a Level A Shutdown Zone, construction activities were immediately suspended until the marine mammal was sighted moving out of and away from the Shutdown Zone or was not sighted within the zone for 15 minutes after the shutdown.

Level B Monitoring Zones

PSOs (OBEC staff) were responsible for monitoring these zones. Monitoring occurred continuously during the use of a vibratory hammer and diesel impact hammer for pile removal and installation activities. When marine mammals entered this zone, work continued, but the sightings were recorded on a monitoring form.

Monitoring Schedule

As established in the NMFS-approved MMMP, the monitoring schedule during construction was as follows:

- a) During vibratory pile removal and installation activities:
 - i) Two PSOs were onsite the first day of vibratory removal and/or installation activities at each bridge; one PSO was onsite every third day thereafter.
 - ii) One PSO was stationed at the best practicable land-based vantage point to observe the downstream portion of the Monitoring Zone, and the other was positioned at the best practicable land-based vantage point to monitor the upstream portion of the Monitoring Zone.
 - iii) The ODOT onsite inspector was onsite during all vibratory hammer activities to ensure that no species entered the 15-meter Shutdown Zone.
- b) During impact pile driving activities:
 - i) Two PSOs were onsite the first two days of impact hammer pile driving at each bridge, and every third day thereafter.
 - ii) One PSO was stationed at the best practicable land-based vantage point to observe the downstream portion of the Monitoring Zone, and the other was positioned at the best practicable land-based vantage point to monitor the upstream portion of the Monitoring Zones.
 - iii) The ODOT onsite inspector was onsite during all impact hammer pile driving activities to ensure that no species entered the 55-meter Shutdown Zone.
- c) During substructure demolition activities (not including pile removal) and superstructure demolition and construction activities:
 - i) One PSO was onsite once a week to monitor the 10-meter Shutdown Zone.
 - ii) The ODOT onsite inspector was onsite during all construction activities to ensure no species entered the 10-meter Shutdown Zone.

Monitoring Protocols

PSOs monitored marine mammal presence within the Level B Monitoring Zone according to the following protocols:

- a) A 30-minute pre-construction marine mammal monitoring period was established before the first pile driving or pile removal of the day and a 30-minute post-construction monitoring period occurred after the last pile driving or pile removal of the day. In cases where the contractor's personnel took a break between subsequent pile driving or pile removal for more than 30 minutes, additional pre-construction marine mammal monitoring occurred before the next start-up of pile driving or pile removal.
- b) PSOs used binoculars to scan the Monitoring Zone for marine mammals; spotting scopes were used intermittently when necessary.
- c) When marine mammals were observed, the following information was documented:
 - i) Species of observed marine mammals and the PSO's confidence in the species identification;
 - ii) Number of observed marine mammal individuals;
 - iii) Life stages of observed marine mammals;
 - iv) Behavior of observed marine mammals;
 - v) The visual cue to the marine mammals' presence (head or body);
 - vi) Marine mammals' reaction (if any) to pile-driving activities or other construction-related stressors;
 - vii) Location;
 - viii) Distance from the observed marine mammals to the construction activity and to the observation point;
 - ix) Date and time of observation; and
 - x) Estimated amount of time the mammals remained in the Level B Monitoring Zone. This was calculated as the duration between the initial sighting and the construction stop time, unless mammal was seen physically leaving the monitoring zone.
- d) To minimize the likelihood of two observers recording the same marine mammal sighting, PSOs were in communication via two-way radios. When one PSO sighted a seal or sea lion, they communicated the species, number, location, and direction of travel to the second PSO, who used this information when determining whether a subsequent sighting was a new individual. In cases where there was a question as to whether a sighting was a new or previously recorded mammal, the sighting was recorded as a new observation.
- e) PSOs were also in communication with ODOT inspectors while monitoring. The ODOT inspector updated PSOs on the status of construction activities throughout the day. If a marine mammal was present within the Shutdown Zone, PSOs were notified.

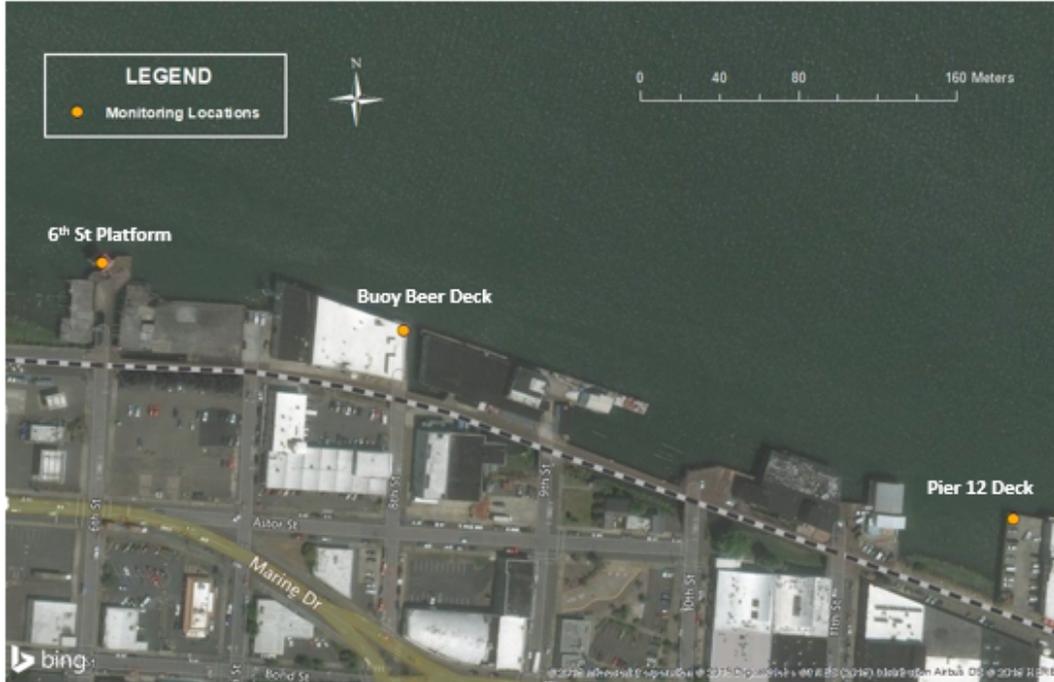
Monitoring Locations

Monitoring locations for PSOs during IWW activities included a raised platform at the end of 6th Street, the Buoy Beer deck (at the end of 8th Street), and the Pier 12 deck (see Figure 2). ODOT onsite inspectors monitored the Shutdown Zone from the location of the construction activity.

The Project area is located in downtown Astoria where there is frequent vehicular and pedestrian traffic associated with locals, tourists, and businesses. Although there was an occasional interaction

between a PSO and a curious pedestrian, human activity in the monitoring area did not affect monitoring activities.

Figure 2. PSO Monitoring Locations



Results

Monitoring Summary

OBEC PSOs were present and monitoring for a total of 15 days of vibratory hammer and diesel hammer use during in-water work. See Table 2 below for a summary of PSO monitoring efforts. For details, see Appendix A for monitoring data.

Table 2 – Summary of PSO Monitoring Efforts

Activity	Total PSO Monitoring Days
Impact Pile Driving	5
Vibratory Pile Install/Removal	11
Total Monitoring Days	15*

* January 10, 2019 included both impact pile driving and vibratory pile install/removal activities.

Construction Activity Summary

The initial IHA called for the removal of 85 timber elements at each bridge, for a total of 255 elements. This included the removal of the existing 14-inch timber piles and all associated timber crossbracing, bottomplates, etc. The timber piles were removed using a vibratory hammer and via

direct pull with a choker chain; the other timber elements were removed with the choker chain. Table 3 provides an estimated number of timber piles removed with the vibratory hammer at each bridge.

Table 3 - Summary of Pile Removal and Installation Activities by Bridge			
Activity	7th Street	9th Street	11th Street
Vibratory Timber Pile Removal			
<i>Number of Days</i>	1 day	1 day	1 day
<i>Estimated Number of Timber Piles Removed</i>	25	30	45
Vibratory Steel Casing and Pile Installation			
<i>Total Number of Permanent Piles</i>	21	25	28
<i>Number of Days</i>	10 days	9 days	4 days
<i>Average Temp Casings Installed or Removed/Day*</i>	4.2	5.6	14
<i>Average Permanent Piles Installed/Day</i>	2.1	2.8	7
Impact Pile Driving			
<i>Number of Days</i>	1 day	2 days	2 days
<i>Average Piles Installed/Day</i>	21	13	14
<i>*Total number of temporary casings is 2x the total number of permanent piles to account for their installation and subsequent removal at each permanent pile location.</i>			

As noted in Table 3 above, all temporary casings were installed (and subsequently removed) using a vibratory hammer. The new permanent steel piles were also installed using a vibratory hammer to the extent practicable before an impact hammer was used to seat the pile tips into the bedrock.

The following provides a summary of how the removal and replacement activities deviated from the estimates and assumptions in the IHA application:

- The IHA application assumed a temporary work platform with ten 16-inch temporary piles would be used but no work bridge was necessary. As a result, the ten temporary piles assumed under the IHA were not installed. The IHA application assumed the contractor would splice together two 40-foot piles at each pile location; instead, the contractor purchased 70- to 80-foot-long piles, eliminating the need for splicing over the water.

- The contractor used a template system to lay out permanent pile locations, requiring the use of 36-inch temporary casings, which was not discussed in the IHA application. The use of the temporary casings was a contract requirement with a bid item. A total of 74 temporary steel casings were installed and then removed during construction of the new trestle crossings.
- The Federal Aid Highway Program (FAHP) Programmatic Biological Opinion (BO) was utilized on this Project for Endangered Species Act coverage. This BO requires that pile installation occur using a vibratory hammer as much as possible as an impact minimization measure for listed fish species. As a result, the contractor first utilized a vibratory hammer to advance the piles to roughly 80 percent of the desired depth before using the diesel hammer to seat the piles in the bedrock.
- The IHA application estimated that pile installation would require approximately 250 strikes per pile. The average number of strikes per pile was 325. Although each pile required more strikes than estimated in the IHA, the average time required to drive one pile was significantly less than anticipated because the piles were first driven with a vibratory hammer. Each pile required approximately 7.5 minutes of impact pile driving to set the tip into the bedrock. Therefore, the number of piles installed per day was higher than anticipated in the IHA application, and the number of days required to install all of the piles was less.

Though pile installation numbers were greater than originally assumed under the submitted IHA request, adverse impacts to marine mammals within the area during construction were not observed. As evidenced in the monitoring data provided in Attachment 1, no injured marine mammals were observed within the monitoring zones, and a change in mammal behavior was only recorded during eight of the 391 observations recorded.

Marine Mammal Sightings

Two marine mammal species were observed during the monitoring efforts: the California sea lion (CSL) and the Pacific harbor seal (HS). No stellar sea lions were observed during construction.

Behavioral reactions to construction activities by California sea lions were observed in only five percent of observed individuals and included travel towards and away from construction activities. No behavioral reactions to construction activities by Pacific harbor seals were observed.

No Level A Harassment take occurred during the construction monitoring efforts. One dead California sea lion was observed within the project area on Monday May 13, 2019. ODOT inspectors observed the mammal in the morning before construction activities began. No construction activities occurred over the weekend; therefore, the death was determined to not be associated with or related to the activities authorized in the IHA. ODOT inspectors were provided with contact information to report the incident to the Office of Protected Resources and the West Coast Stranding Coordinator.

Shutdown Zone Observations

California sea lions entered the Shutdown Zone while construction activities were occurring, resulting in construction delay or shutdown, on the following days:

- 12/11/2018: One California sea lion approached the edge of the Shutdown Zone during vibratory pile installation/removal activities. The sea lion was not observed leaving the Shutdown Zone, so construction was halted until 15 minutes after the sea lion was last seen.
- 1/7/2019: One California sea lion entered the Shutdown Zone during vibratory pile installation/removal activities before immediately leaving the zone. Construction activities were not impacted.
- 1/10/2019: Several California sea lions entered the Shutdown Zone several times throughout the day. Construction was delayed when sea lions entered the Shutdown Zone prior to construction starting and was shut down when sea lions entered while construction activities were occurring. Work was not resumed until all mammals were observed leaving the Shutdown Zone or had not been seen inside the Shutdown Zone for 15 minutes.

Level B Harassment Take

To determine the total number of Level B Harassment take that occurred during construction activities, observed take numbers from the 15 days of PSO monitoring were used to extrapolate take data for days with no PSO presence. Vibratory hammer and diesel impact hammer use occurred over an additional 15 days when PSOs were not onsite to monitor (30 total days of vibratory and diesel impact hammer use). Extrapolated numbers were then added to observed take numbers to estimate the total number of Level B Harassment take. These data are summarized in Table 4 below.

The estimated number of take for each day a PSO was not present was estimated using the highest number of observations that occurred in one monitoring day, by species. This method was used to reduce the likelihood of underestimating the total take. For California sea lions, the most observations in one day occurred on January 10, 2019, when 240 individuals were observed. For Pacific harbor seals, the most observations in one day occurred on February 14, 2019, when 18 individuals were observed.

Table 4 – Summary of Level B Harassment Take

Species	Number of Take Recorded by PSOs during Monitoring	Estimated Number of Take on Days PSO not Present	Total Estimated Number of Level B Harassment Take	Authorized Level B Harassment Take Number	Percent of Authorized Take that Occurred
California sea lion	604	3600 (240 x 15 days)	4204	33,736	12.5
Steller sea lion	0	0	0	5,360	0
Pacific harbor seal	53	270 (18 x 15 days)	323	4,560	7.1

For all species, the estimated number of total Level B Harassment take was well below the IHA-authorized take levels for the Project. Only 12.5 percent of the authorized take for California sea lions and 7.1 percent of authorized take for Pacific harbor seals occurred. No Steller sea lions were observed during construction. A spreadsheet of the Marine Mammal Monitoring Data is provided in Attachment 1.

Summary

Though changes in the pile installation activities occurred during the Project, ODOT looked at the changes internally through the lens of the IHA prior to allowing work to proceed. The contractor was in constant communication with ODOT inspectors. ODOT environmental and inspection staff were regularly communicating with PSOs during construction. The PSO monitoring data was recorded in the Project spreadsheet on a weekly basis to allow for continuous tracking of the take numbers. Because the actual take numbers were far below the approved take limits for each of the three species, it was believed the project was in compliance with the issued IHA. Lessons learned and outcomes from this Project's monitoring effort will be used to inform decision-making during the subsequent replacement of the 6th, 8th, and 10th Street bridges.

ATTACHMENT 1
Marine Mammal Monitoring Data

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Doschka	12/11/18	9:00 AM	12:00 PM	Rain/Windy	9th St	Vibratory Pile Removal	14" Timber Piles	--	--	9:00 AM	CSL	2	Male	AD	1600	400	265	1	M	Traveling	None
										9:15 AM	CSL	2	Male	AD	1600	350	165	30	S	Traveling	None
										9:27 AM	CSL	2	Male	AD	1600	60	300	5	M	Traveling	None
										9:45 AM	CSL	3	Male	AD	1600	200	410	2	M	Traveling	None
										9:52 AM	CSL	1	Male	AD	1600	400	265	5	S	Traveling	None
										10:40 AM	CSL	3	Male	AD	1600	200	70	10	S	Traveling	None
										11:05 AM	CSL	1	Male	AD	1600	400	420	10	S	Traveling	None
										11:10 AM	CSL	1	Male	AD	1600	60	230	1	M	Traveling	None
										11:20 AM	HS	1	Male	AD	1600	300	230	10	S	Traveling	None
										11:25 AM	CSL	1	Male	AD	1600	250	20	20	S	Traveling	None
Stupfel	12/11/18	9:00 AM	12:00 PM	Rain/Windy	9th St	Vibratory Pile Removal	14" Timber Piles	--	--	9:10 AM	CSL	3	Male	AD	1600	100	100	1	M	Traveling	None
										9:15 AM	CSL	4	Male	AD	1600	100	100	1	M	Traveling	None
										9:40 AM	CSL	2	Male	AD	1600	100	100	3	M	Traveling	None
										9:49 AM	CSL	1	Male	AD	1600	100	100	15	S	Traveling	None
										9:51 AM	HS	1	Male	AD	1600	250	125	30	S	Traveling	None
										9:52 AM	CSL	1	Male	AD	1600	100	100	30	S	Traveling	None
										10:15 AM	HS	1	Male	AD	1600	150	100	15	S	Traveling	None
										10:24 AM	CSL	4	Male	AD	1600	150	125	30	S	Traveling	None
										10:30 AM	HS	2	Male	AD	1600	250	125	1	M	Traveling	None
										10:39 AM	CSL	2	Male	AD	1600	150	125	1	M	Traveling	None
										10:41 AM	CSL	1	Male	AD	1600	150	125	30	S	Traveling	None
										10:42 AM	CSL	2	Male	AD	1600	150	125	30	S	Traveling	None
										10:46 AM	HS	1	Male	AD	1600	350	325	30	S	Traveling	None
										10:52 AM	HS	2	Male	AD	1600	150	125	30	S	Traveling	None
										10:57 AM	HS	1	Male	AD	1600	500	200	30	S	Traveling	None
10:57 AM	CSL	2	Male	AD	1600	450	180	30	S	Traveling	None										

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Stupfel	12/11/18	9:00 AM	12:00 PM	Rain/Windy	9th St	Vibratory Pile Removal	14" Timber Piles	--	--	11:01 AM	HS	2	Male	AD	1600	550	400	1	M	Traveling	None
										11:07 AM	HS	1	Male	AD	1600	300	125	2	M	Traveling	None
										11:13 AM	HS	1	Male	AD	1600	150	125	1	M	Traveling	None
										11:20 AM	HS	1	Male	AD	1600	650	300	1	M	Traveling	None
										11:23 AM	HS	1	Male	AD	1600	200	100	1	M	Traveling	None
										11:26 AM	HS	1	Male	AD	1600	275	125	1	M	Traveling	None
Doschka	12/19/18	8:30 AM	10:30 AM	Light Rain	7th St	Vibratory Pile Removal	14" Timber Piles	--	--	8:31 AM	CSL	1	Male	AD	1600	300	50	5	S	Traveling	None
										8:33 AM	CSL	2	Male	AD	1600	400	30	5	S	Traveling	None
										8:40 AM	CSL	2	Male	AD	1600	400	275	10	S	Traveling	None
										8:50 AM	CSL	1	Male	AD	1600	100	300	5	S	Traveling	None
										8:55 AM	CSL	4	Male	AD	1600	450	215	30	S	Traveling	None
										8:55 AM	CSL	1	Male	AD	1600	400	95	15	S	Traveling	None
										8:57 AM	CSL	2	Male	AD	1600	450	75	10	S	Traveling	None
										9:05 AM	CSL	3	Male	AD	1600	350	300	10	S	Traveling	None
										9:15 AM	CSL	1	Male	AD	1600	400	40	5	S	Traveling	None
										9:20 AM	HS	1	Unk	AD	1600	400	120	5	S	Traveling	None
										9:20 AM	CSL	4	Male	AD	1600	60	315	2	M	Traveling	None
										9:26 AM	CSL	2	Male	AD	1600	380	50	10	S	Traveling	None
Stupfel	12/19/18	8:30 AM	10:30 AM	Light Rain	7th St	Vibratory Pile Removal	14" Timber Piles	--	--	8:32 AM	CSL	1	Male	AD	1600	170	90	1	M	Traveling	None
										8:50 AM	CSL	1	Male	AD	1600	100	100	30	S	Traveling	None
										9:12 AM	CSL	1	Male	AD	1600	150	60	4	M	Resting	None
										9:20 AM	CSL	1	Male	AD	1600	100	90	1	M	Traveling	None
										9:20 AM	CSL	1	Male	AD	1600	50	75	1	M	Traveling	None
										9:30 AM	CSL	1	Male	AD	1600	60	70	1	M	Traveling	None
										9:32 AM	CSL	1	Male	AD	1600	350	250	5	M	Resting	None

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Stupfel	12/19/18	8:30 AM	10:30 AM	Light Rain	7th St	Vibratory Pile Removal	14" Timber Piles	--	--	9:33 AM	CSL	1	Male	AD	1600	450	325	1	M	Resting	None
										9:43 AM	CSL	1	Male	AD	1600	100	100	5	M	Traveling	None
										9:46 AM	CSL	1	Unk	AD	1600	1200	775	3	M	Traveling	None
Wirth	12/28/18	8:30 AM	10:00 AM	Rain	9th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	8:30 AM	CSL	1	Male	AD	1600	515	620	1.5	H	Traveling	None
										9:00 AM	CSL	1	Male	AD	1600	215	355	1	H	Traveling	None
										9:15 AM	CSL	1	Male	AD	1600	140	275	0.75	H	Traveling	None
										9:20 AM	CSL	1	Male	AD	1600	370	470	0.75	H	Traveling	None
										9:45 AM	HS	1	Unk	UN	1600	260	130	0.25	H	Traveling	None
										9:53 AM	CSL	1	Male	AD	1600	345	125	7	M	Traveling	None
										8:36 AM	CSL	1	Male	AD	1600	180	70	1.5	H	Traveling	None
										9:00 AM	CSL	1	Male	AD	1600	315	90	1	H	Traveling	None
										9:30 AM	CSL	1	Male	AD	1600	360	155	0.5	H	Traveling	None
										9:41 AM	CSL	1	Male	AD	1600	120	135	0.25	H	Traveling	None
										9:45 AM	CSL	2	Male	AD	1600	220	45	0.25	H	Traveling	None
9:46 AM	CSL	1	Male	AD	1600	250	20	0.25	H	Traveling	None										
Doschka	1/3/19	12:00 PM	5:00 PM	Light Rain/Windy	9th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	12:45 PM	HS	1	Male	AD	1600	150	110	30	M	Traveling	None
										12:50 PM	CSL	1	Male	AD	1600	250	30	15	M	Traveling	None
										1:44 PM	HS	1	Male	AD	1600	150	100	10	M	Traveling	None
										1:56 PM	CSL	2	Male	AD	1600	150	90	2	M	Traveling	None
										1:56 PM	CSL	2	Male	AD	1600	250	150	1	M	Traveling	None
										2:08 PM	CSL	1	Male	AD	1600	175	90	1	M	Traveling	None
										2:30 PM	CSL	1	Male	AD	1600	250	60	1	M	Traveling	None
										2:35 PM	CSL	1	Male	AD	1600	250	35	1	M	Traveling	None
										2:37 PM	CSL	1	Male	AD	1600	300	60	5	M	Traveling	None
										2:44 PM	HS	1	Male	AD	1600	350	105	5	M	Traveling	None
										3:31 PM	CSL	1	Male	AD	1600	225	85	1	M	Traveling	None

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Doschka	1/3/19	12:00 PM	5:00 PM	Light Rain/Windy	9th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	4:00 PM	CSL	1	Male	AD	1600	400	325	5	M	Traveling	None
										4:12 PM	CSL	1	Male	AD	1600	200	125	2	M	Traveling	None
										4:14 PM	CSL	2	Male	AD	1600	200	80	5	M	Traveling	None
										4:22 PM	CSL	2	Male	AD	1600	225	35	5	M	Traveling	None
Wirth	1/3/19	12:00 PM	5:00 PM	Light Rain/Windy	9th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	1:39 PM	CSL	1	Male	AD	1600	350	130	3	H	Traveling	None
										1:45 PM	CSL	1	Male	AD	1600	280	215	3	H	Traveling	None
										2:08 PM	CSL	2	Male	AD	1600	270	45	2.5	H	Traveling	None
										2:13 PM	CSL	1	Male	AD	1600	245	25	2.5	H	Traveling	None
										2:15 PM	CSL	1	Male	AD	1600	100	290	2.5	H	Traveling	None
										2:37 PM	CSL	1	Male	AD	1600	160	145	2.25	H	Traveling	None
										2:53 PM	CSL	1	Male	AD	1600	160	110	1.75	H	Traveling	None
										2:58 PM	CSL	1	Male	AD	1600	195	100	1.75	H	Traveling	None
										3:33 PM	CSL	1	Male	AD	1600	95	265	1.25	H	Traveling	None
										3:35 PM	CSL	1	Male	AD	1600	265	365	1.25	H	Traveling	None
										4:21 PM	CSL	1	Male	AD	1600	80	310	0.5	H	Traveling	None
Benson	1/8/19	12:00 PM	4:45 PM	Light Rain/Windy	9th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	12:17 PM	CSL	1	Male	AD	1600	165	105	4.25	H	Traveling	None
										12:20 PM	CSL	1	Male	AD	1600	115	185	4.25	H	Traveling	None
										12:27 PM	CSL	1	Male	AD	1600	300	110	4	H	Traveling	None
										1:42 PM	CSL	2	Male	AD	1600	155	105	2.75	H	Traveling	None
										1:52 PM	CSL	1	Male	AD	1600	220	30	2.75	H	Traveling	None
										2:06 PM	CSL	1	Male	AD	1600	195	55	2.5	H	Traveling	None
										2:08 PM	CSL	1	Male	AD	1600	195	110	2.5	H	Traveling	None
										2:58 PM	HS	1	Unk	AD	1600	260	35	1.5	H	Traveling	None
										3:16 PM	CSL	1	Male	AD	1600	280	100	1.25	H	Traveling	None
										3:18 PM	CSL	1	Male	AD	1600	110	160	1.25	H	Traveling	None

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Benson	1/8/19	12:00 PM	4:45 PM	Light Rain/Windy	9th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	3:59 PM	CSL	1	Male	AD	1600	245	5	0.5	H	Traveling	None
										4:27 PM	CSL	1	Male	AD	1600	170	85	3	M	Traveling	None
										4:30 PM	HS	1	Unk	AD	1600	215	200	1	M	Traveling	None
Wirth	1/8/19	12:00 PM	4:45 PM	Light Rain/Windy	9th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	12:25 PM	CSL	1	Male	AD	1600	135	380	4.25	H	Traveling	None
										1:44 PM	HS	1	Unk	AD	1600	280	125	2.75	H	Traveling	None
										1:48 PM	CSL	1	Male	AD	1600	80	275	2.75	H	Traveling	None
										1:49 PM	HS	1	Unk	AD	1600	170	400	2.75	H	Traveling	None
										2:57 PM	CSL	1	Male	AD	1600	150	90	1.5	H	Traveling	None
										3:15 PM	HS	1	Unk	AD	1600	240	105	1.25	H	Traveling	None
										3:59 PM	CSL	1	Male	AD	1600	170	190	0.5	H	Traveling	None
Stupfel	1/10/19	10:00 AM	5:00 PM	Light Rain/Windy	9th St	Impact Pile Driving	24" Steel Piles	7.5 MIN	13	11:50 AM	CSL	2	Male	AD	398	150	80	2	M	Traveling	None
										12:08 PM	CSL	1	Male	AD	398	180	60	10	M	Traveling	None
										12:30 PM	CSL	1	Male	AD	398	190	60	1	M	Traveling	None
										12:51 PM	CSL	2	Male	AD	398	200	30	5	M	Traveling	None
										1:42 PM	CSL	1	Male	AD	398	180	40	1	M	Traveling	None
										2:00 PM	CSL	5	Male	AD	398	180	40	10	M	Traveling	None
										2:09 PM	CSL	2	Male	AD	398	200	30	1	M	Traveling	None
										2:24 PM	CSL	2	Male	AD	398	200	30	3	M	Traveling	None
4:52 PM	CSL	2	Male	AD	398	120	30	5	M	Resting	None										
Stupfel	1/10/19	3:15 PM	5:15 PM	Light Rain/Windy	7th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	3:25 PM	CSL	5	Male	AD	1600	80	60	5	M	Traveling	None
										3:25 PM	CSL	1	Female	AD	1600	80	60	5	M	Traveling	None
										3:40 PM	CSL	3	Male	AD	1600	180	30	3	M	Traveling	None
										3:45 PM	CSL	1	Male	AD	1600	500	350	5	M	Resting	None
										3:47 PM	CSL	4	Male	AD	1600	1300	1250	1	M	Traveling	None
										3:47 PM	CSL	1	Male	AD	1600	180	60	3	M	Traveling	None

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Stupfel	1/10/19	3:15 PM	5:15 PM	Light Rain/Windy	7th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	3:50 PM	CSL	1	Male	AD	1600	400	350	1	M	Traveling	None
										3:50 PM	CSL	3	Male	AD	1600	18	40	3	M	Traveling	None
										3:50 PM	CSL	4	Male	AD	1600	180	40	5	M	Traveling	None
										3:55 PM	CSL	1	Male	AD	1600	100	70	5	M	Traveling	None
										3:57 PM	CSL	8	Male	AD	1600	200	30	10	M	Resting	None
										3:57 PM	CSL	3	Male	AD	1600	250	40	39	M	Traveling	None
										3:59 PM	CSL	1	Male	AD	1600	500	350	37	M	Traveling	None
										4:00 PM	CSL	2	Male	AD	1600	1300	1250	36	M	Traveling	None
										4:00 PM	CSL	3	Male	AD	1600	100	80	36	M	Traveling	None
										4:00 PM	CSL	3	Male	AD	1600	150	40	36	M	Traveling	None
										4:02 PM	CSL	6	Male	AD	1600	350	60	34	M	Traveling	None
										4:02 PM	CSL	1	Male	AD	1600	400	100	34	M	Traveling	None
										4:03 PM	CSL	1	Male	AD	1600	200	30	33	M	Traveling	None
										4:16 PM	CSL	2	Male	AD	1600	150	15	20	M	Traveling	None
4:32 PM	CSL	2	Male	AD	1600	100	100	4	M	Traveling	None										
Doschka	1/10/19	10:00 AM	5:00 PM	Light Rain/Windy	9th St	Impact Pile Driving	24" Steel Piles	7.5 MIN	12	11:23 AM	CSL	14	Unk	AD	398	80	235	5.5	H	Traveling	Traveled away from construction site
										11:23 AM	CSL	2	Unk	AD	398	200	50	2	M	Traveling	Traveled away from construction site
										11:25 AM	CSL	2	Unk	AD	398	398	550	5.5	H	Traveling	Traveled away from construction site
										11:40 AM	CSL	6	Male	AD	398	300	185	5	H	Traveling	None
										11:45 AM	CSL	4	Male	AD	398	40	225	5	H	Traveling	None
										11:50 AM	CSL	2	Male	AD	398	150	80	5	H	Traveling	None
										11:51 AM	CSL	1	Male	AD	398	40	225	5	H	Traveling	None
										12:09 PM	CSL	3	Unk	AD	398	100	150	4.5	H	Traveling	None
										12:13 PM	CSL	1	Unk	AD	398	40	225	4.5	H	Traveling	None
										12:33 PM	CSL	4	Unk	AD	398	40	235	4	H	Traveling	None
										12:38 PM	CSL	1	Male	AD	398	250	25	4	H	Traveling	None

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Doschka	1/10/19	10:00 AM	5:00 PM	Light Rain/Windy	9th St	Impact Pile Driving	24" Steel Piles	7.5 MIN	12	12:44 PM	CSL	1	Male	AD	398	250	10	4	H	Traveling	None
										12:45 PM	CSL	4	Male	AD	398	60	230	4	H	Traveling	None
										12:49 PM	CSL	2	Male	AD	398	250	50	4	H	Traveling	None
										12:56 PM	CSL	2	Male	AD	398	80	270	4	H	Traveling	None
										1:07 PM	CSL	6	Unk	AD	398	200	360	4	H	Traveling	None
										1:22 PM	CSL	4	Unk	AD	398	398	525	2	M	Traveling	Traveled away from construction site/breaching
										1:25 PM	CSL	2	Unk	AD	398	150	275	3.5	H	Traveling	Traveled away from construction site/breaching/splashing
										1:40 PM	CSL	6	Male	AD	398	300	500	3	H	Traveling	Traveled away from construction site
										1:45 PM	CSL	7	Male	AD	398	200	50	3	H	Traveling	None
										1:47 PM	CSL	3	Male	AD	398	250	50	3	H	Traveling	None
										1:47 PM	CSL	3	Male	AD	398	250	50	3	H	Traveling	None
										1:54 PM	CSL	1	Male	AD	398	200	400	3	H	Traveling	Traveled towards construction site/breaching
										2:02 PM	CSL	1	Male	AD	398	250	50	3	H	Traveling	None
										2:05 PM	CSL	2	Unk	AD	398	150	370	3	H	Traveling	None
										2:05 PM	CSL	1	Unk	AD	398	60	200	3	H	Traveling	None
										2:15 PM	CSL	1	Male	AD	398	200	30	2.75	H	Traveling	None
										2:20 PM	CSL	7	Unk	AD	398	100	300	2.75	H	Traveling	None
										2:20 PM	CSL	1	Male	AD	398	250	50	2.75	H	Traveling	None
										2:27 PM	CSL	1	Male	AD	398	40	200	2.5	H	Traveling	None
										2:30 PM	CSL	2	Male	AD	398	225	200	2.5	H	Traveling	None
2:36 PM	CSL	1	Male	AD	398	125	300	2.5	H	Traveling	None										
2:43 PM	CSL	1	Male	AD	398	398	325	2	M	Traveling	None										
2:46 PM	HS	1	Unk	AD	398	350	200	2	H	Traveling	None										
2:48 PM	CSL	10	Male	AD	398	225	20	2	H	Traveling	None										
2:55 PM	CSL	3	Male	AD	398	225	50	2	H	Traveling	None										
Doschka	1/10/19	3:15 PM	5:15 PM	Light Rain/Windy	9th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	3:02 PM	CSL	4	Male	AD	398	150	50	2	H	Traveling	None

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Doschka	1/10/19	3:15 PM	5:15 PM	Light Rain/Windy	9th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	3:02 PM	CSL	2	Unk	AD	398	200	300	2	H	Traveling	None
										3:04 PM	CSL	4	Unk	AD	398	125	200	2	H	Traveling	None
										3:04 PM	CSL	2	Unk	AD	398	250	30	2	H	Traveling	None
										3:09 PM	CSL	4	Male	AD	398	250	20	2	H	Traveling	None
										3:10 PM	CSL	5	Male	AD	398	250	50	2	H	Traveling	None
										3:18 PM	CSL	5	Male	AD	398	350	380	2	H	Traveling	None
										3:20 PM	CSL	4	Male	AD	398	150	380	1.7	H	Traveling	None
										3:20 PM	CSL	3	Male	AD	398	225	40	1.5	H	Traveling	None
										3:40 PM	CSL	7	Male	AD	398	125	350	1.5	H	Traveling	None
										3:43 PM	CSL	1	Male	AD	398	225	40	1.25	H	Traveling	None
										3:58 PM	CSL	3	Male	AD	398	175	400	1	H	Traveling	None
										4:01 PM	CSL	2	Male	AD	398	225	50	1	H	Traveling	None
										4:10 PM	CSL	5	Unk	AD	398	200	450	1	H	Traveling	None
4:22 PM	CSL	3	Male	AD	398	225	30	0.7	H	Traveling	None										
Wirth	1/11/19	8:00 AM	9:00 AM	Windy	9th St	Impact Pile Driving	24" Steel Piles	7.5 MIN	13	8:15 AM	CSL	2	Male	AD	398	250	220	0.75	H	Traveling	None
										8:30 AM	CSL	2	Male	AD	398	175	80	0.75	H	Traveling	None
										8:38 AM	CSL	1	Male	AD	398	290	340	2	M	Traveling	None
										8:41 AM	CSL	1	Male	AD	398	265	30	19	M	Traveling	None
										8:41 AM	CSL	1	Male	AD	398	350	110	19	M	Traveling	None
										9:00 AM	CSL	1	Male	AD	398	390	145	0	M	Traveling	None
Teixeira	1/11/19	8:00 AM	9:00 AM	Windy	9th St	Impact Pile Driving	24" Steel Piles	7.5 MIN	13	8:15 AM	CSL	8	Male	AD	398	210	100	0.75	H	Traveling	None
										8:33 AM	CSL	1	Male	AD	398	220	105	0.5	H	Traveling	None
Stupfel	1/15/19	8:00 AM	4:00 PM	Windy	7th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	8:40 AM	HS	2	Unk	AD	1600	110	40	10	M	Resting	None
										10:20 AM	CSL	1	Male	AD	1600	60	85	5	M	Traveling	None
										11:40 AM	CSL	1	Male	AD	1600	70	90	1	M	Traveling	None
										3:24 PM	CSL	2	Male	AD	1600	50	65	1	M	Traveling	None

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Wirth	1/21/19	7:30 AM	11:00 AM	Light Rain	7th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	8:00 AM	CSL	1	Male	AD	1600	220	120	3.25	H	Traveling	None
										8:05 AM	CSL	1	Male	AD	1600	415	335	3	H	Traveling	None
										8:06 AM	CSL	1	Male	AD	1600	170	110	3	H	Traveling	None
										8:10 AM	CSL	1	Male	AD	1600	1535	1490	3	H	Traveling	None
										8:13 AM	CSL	1	Male	AD	1600	260	205	3	H	Traveling	None
										8:15 AM	CSL	1	Male	AD	1600	75	65	3	H	Traveling	None
										8:17 AM	CSL	1	Male	AD	1600	945	825	3	H	Traveling	None
										8:18 AM	CSL	2	Male	AD	1600	285	175	2.75	H	Traveling	None
										8:21 AM	CSL	1	Male	AD	1600	215	140	2.75	H	Traveling	None
										8:23 AM	CSL	1	Male	AD	1600	135	35	2.75	H	Traveling	None
										8:25 AM	CSL	1	Male	AD	1600	185	185	2.75	H	Traveling	None
										8:27 AM	CSL	1	Male	AD	1600	385	285	2.75	H	Traveling	None
										8:32 AM	CSL	1	Female	AD	1600	120	50	2.75	H	Traveling	None
										8:32 AM	CSL	1	Male	AD	1600	390	340	2.75	H	Traveling	None
										8:37 AM	CSL	1	Male	AD	1600	385	310	2.5	H	Traveling	None
										8:40 AM	CSL	1	Male	AD	1600	240	310	2.5	H	Traveling	None
										8:42 AM	CSL	1	Male	AD	1600	145	65	2.5	H	Traveling	None
										8:45 AM	CSL	2	Male	AD	1600	70	110	2.5	H	Traveling	None
										8:48 AM	CSL	1	Male	AD	1600	1080	1165	2.25	H	Traveling	None
										8:49 AM	CSL	1	Male	AD	1600	75	145	2.25	H	Traveling	None
8:49 AM	CSL	1	Male	AD	1600	175	145	2.25	H	Traveling	None										
8:51 AM	CSL	2	Male	AD	1600	190	235	2.25	H	Traveling	None										
8:56 AM	CSL	1	Male	AD	1600	140	205	2.25	H	Traveling	None										
8:58 AM	HS	1	Unk	AD	1600	220	175	10	M	Traveling	None										
9:03 AM	CSL	1	Male	AD	1600	325	235	2	H	Traveling	None										
9:05 AM	CSL	3	Male	AD	1600	225	230	2	H	Traveling	None										

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Wirth	1/21/19	7:30 AM	11:00 AM	Light Rain	7th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	9:10 AM	CSL	1	Male	AD	1600	390	290	2	H	Traveling	None
										9:12 AM	CSL	1	Male	AD	1600	560	545	15	M	Traveling	None
										9:14 AM	CSL	1	Male	AD	1600	315	270	2	H	Traveling	None
										9:15 AM	CSL	1	Male	AD	1600	415	375	2	H	Traveling	None
										9:15 AM	CSL	1	Male	AD	1600	520	695	2	H	Traveling	None
										9:17 AM	CSL	2	Male	AD	1600	1350	1375	10	M	Traveling	None
										9:20 AM	CSL	1	Male	AD	1600	270	200	1.75	H	Traveling	None
										9:21 AM	CSL	1	Male	AD	1600	175	90	1.75	H	Traveling	None
										9:25 AM	CSL	1	Male	AD	1600	1050	1080	1.75	H	Traveling	None
										9:25 AM	CSL	1	Male	AD	1600	1310	1285	1.75	H	Traveling	None
										9:27 AM	CSL	2	Male	AD	1600	120	10	1.75	H	Traveling	None
										9:57 AM	CSL	1	Male	AD	1600	160	65	1.25	H	Traveling	None
										9:59 AM	HS	1	Unk	AD	1600	150	70	1.25	H	Traveling	None
										10:00 AM	CSL	1	Male	AD	1600	75	35	1.25	H	Traveling	None
										10:02 AM	CSL	1	Male	AD	1600	440	505	1.25	H	Traveling	None
										11:08 AM	CSL	1	Male	AD	1600	110	100	2	M	Traveling	None
										1:07 PM	CSL	1	Male	AD	1600	85	40	2	H	Traveling	None
										1:12 PM	CSL	1	Male	AD	1600	285	375	1.75	H	Traveling	None
										1:20 PM	CSL	1	Male	AD	1600	535	500	10	M	Traveling	None
										1:23 PM	CSL	1	Male	AD	1600	965	935	1.5	H	Traveling	None
1:26 PM	CSL	1	Male	AD	1600	370	425	1.5	H	Traveling	None										
1:32 PM	CSL	1	Male	AD	1600	325	300	1.5	H	Traveling	None										
1:36 PM	CSL	1	Male	AD	1600	715	695	1.5	H	Traveling	None										
1:38 PM	CSL	1	Male	AD	1600	65	85	1.25	H	Traveling	None										
1:40 PM	CSL	1	Male	AD	1600	880	860	1.25	H	Traveling	None										
1:49 PM	CSL	2	Male	AD	1600	590	550	1.25	H	Traveling	None										

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Wirth	1/21/19	7:30 AM	11:00 AM	Light Rain	7th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	3:45 PM	CSL	1	Male	AD	1600	110	25	1	H	Traveling	None
										3:48 PM	CSL	1	Male	AD	1600	70	30	1	H	Traveling	None
										4:17 PM	CSL	1	Male	AD	1600	445	355	28	M	Traveling	None
										4:28 PM	CSL	1	Male	AD	1600	155	65	17	M	Traveling	None
Wirth	1/28/19	2:00 PM	4:30 PM	Windy	7th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	3:13 PM	CSL	1	Male	AD	1600	50	50	1.25	H	Traveling	None
										4:00 PM	CSL	1	Male	AD	1600	80	100	0.5	H	Traveling	None
										4:05 PM	CSL	1	Male	AD	1600	180	95	25	M	Traveling	None
Doschka	2/1/19	8:00 AM	2:45 AM	Windy	7th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	9:02 AM	CSL	1	Male	AD	1600	500	475	10	M	Traveling	None
										9:05 AM	CSL	2	Male	AD	1600	450	400	4.5	H	Traveling	None
										9:08 AM	CSL	2	Male	AD	1600	300	350	20	M	Traveling	None
										9:19 AM	CSL	1	Male	AD	1600	300	350	4	H	Traveling	None
										9:30 AM	CSL	1	Male	AD	1600	300	350	30	M	Traveling	None
										9:38 AM	CSL	1	Male	AD	1600	100	20	20	M	Traveling	None
										10:34 AM	CSL	2	Male	AD	1600	250	300	3	H	Traveling	None
										10:46 AM	CSL	3	Male	AD	1600	275	325	3	H	Traveling	None
										10:56 AM	CSL	1	Male	AD	1600	300	350	2.5	H	Traveling	None
										11:07 AM	CSL	2	Male	AD	1600	300	350	2.5	H	Traveling	None
										11:15 AM	CSL	1	Male	AD	1600	100	20	2.25	H	Traveling	None
										11:20 AM	CSL	1	Male	AD	1600	150	50	2.25	H	Traveling	None
										11:27 AM	CSL	1	Male	AD	1600	100	20	2	H	Traveling	None
										11:33 AM	CSL	2	Male	AD	1600	300	350	2	H	Traveling	None
										11:38 AM	CSL	1	Male	AD	1600	400	400	2	H	Traveling	None
										11:43 AM	CSL	1	Male	AD	1600	80	20	1.75	H	Traveling	None
11:57 AM	HS	1	Unk	AD	1600	250	300	1.5	H	Traveling	None										
12:02 PM	CSL	1	Male	AD	1600	125	80	1.5	H	Traveling	None										
12:14 PM	CSL	1	Male	AD	1600	600	625	1.25	H	Traveling	None										

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Doschka	2/1/19	8:00 AM	2:45 AM	Windy	7th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	12:15 PM	CSL	1	Male	AD	1600	300	350	1.25	H	Traveling	None
										12:15 PM	CSL	1	Male	AD	1600	100	60	1.25	H	Traveling	None
										12:55 PM	CSL	1	Male	AD	1600	300	350	35	M	Traveling	None
										12:58 PM	CSL	1	Male	AD	1600	100	20	30	M	Traveling	None
										1:05 PM	CSL	1	Male	AD	1600	300	350	25	M	Traveling	None
Teixeira	2/4/19	11:30 AM	6:00 PM	Light Rain/Windy	7th St	Impact Pile Driving	24" Steel Piles	7.5 MIN	21	11:37 AM	CSL	1	Male	AD	398	120	25	4.75	H	Traveling	None
										11:49 AM	CSL	1	Male	AD	398	75	35	4.75	H	Traveling	None
										12:25 PM	CSL	1	Male	AD	398	110	15	4.75	H	Traveling	None
										1:00 PM	CSL	1	Male	AD	398	40	65	4.75	H	Traveling	None
										1:34 PM	CSL	1	Male	AD	398	345	270	4.5	H	Traveling	None
										1:43 PM	CSL	1	Male	AD	398	175	80	4.25	H	Traveling	None
										1:52 PM	CSL	1	Male	AD	398	60	85	4.25	H	Traveling	None
										3:00 PM	CSL	1	Male	AD	398	55	45	3	H	Traveling	None
Wirth	2/4/19	11:30 AM	6:00 PM	Light Rain/Windy	7th St	Impact Pile Driving	24" Steel Piles	7.5 MIN	21	1:30 PM	CSL	1	Male	AD	398	90	375	4.5	H	Traveling	None
										1:44 PM	CSL	1	Male	AD	398	90	5	4.25	H	Traveling	None
										1:48 PM	CSL	1	Male	AD	398	80	30	4.25	H	Traveling	None
										1:48 PM	CSL	1	Male	AD	398	125	50	4.25	H	Traveling	None
										1:59 PM	CSL	1	Male	AD	398	55	65	4	H	Traveling	None
										2:08 PM	CSL	1	Male	AD	398	105	40	3.75	H	Traveling	None
										2:20 PM	CSL	1	Male	AD	398	215	175	3.75	H	Traveling	None
										2:24 PM	CSL	2	Male	AD	398	235	165	3.5	H	Traveling	None
										2:42 PM	CSL	1	Male	AD	398	65	30	3.25	H	Traveling	None
										3:57 PM	CSL	1	Male	AD	398	70	45	2	H	Traveling	None
Benson	2/14/19	10:00 AM	2:00 PM	Light Rain/Windy	11th St	Vibratory Pile Removal	14" Timber Piles	--	--	10:35 AM	CSL	1	Male	AD	1600	530	115	5.75	H	Traveling	None
										11:25 AM	CSL	1	Male	AD	1600	460	75	4.75	H	Traveling	None
										11:31 AM	CSL	1	Male	AD	1600	490	80	4.75	H	Traveling	Jumped out of water 6-7 times

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Benson	2/14/19	10:00 AM	2:00 PM	Light Rain/Windy	11th St	Vibratory Pile Removal	14" Timber Piles	--	--	11:32 AM	CSL	2	Male	AD	1600	470	115	4.75	H	Traveling	None
										11:33 AM	CSL	1	Male	AD	1600	440	45	4.75	H	Traveling	None
										12:15 PM	CSL	2	Male	AD	1600	425	15	4	H	Traveling	None
										12:17 PM	CSL	1	Male	AD	1600	345	100	4	H	Traveling	None
										1:25 PM	HS	1	Unk	AD	1600	370	205	2.75	H	Traveling	None
										1:36 PM	HS	1	Unk	AD	1600	325	250	2.75	H	Traveling	None
Benson	2/14/19	2:15 PM	4:15 PM	Light Rain/Windy	11th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	2:15 PM	HS	1	Unk	AD	1600	390	305	2	H	Traveling	None
										2:16 PM	CSL	1	Male	AD	1600	455	45	2	H	Traveling	None
										2:20 PM	HS	1	Unk	AD	1600	415	20	2	H	Traveling	None
										2:25 PM	HS	1	Unk	AD	1600	840	505	1.75	H	Traveling	None
										2:28 PM	HS	1	Unk	AD	1600	505	180	1.75	H	Traveling	None
										2:29 PM	HS	1	Unk	AD	1600	465	215	1.75	H	Traveling	None
										2:30 PM	HS	1	Unk	AD	1600	425	145	1.75	H	Traveling	None
										2:31 PM	HS	1	Unk	AD	1600	450	115	1.75	H	Traveling	None
										2:31 PM	HS	1	Unk	AD	1600	495	200	1.75	H	Traveling	None
										3:39 PM	CSL	1	Male	AD	1600	405	10	0.5	H	Traveling	None
										3:48 PM	HS	1	Unk	AD	1600	440	180	27	M	Traveling	None
4:07 PM	HS	1	Unk	AD	1600	430	100	8	M	Traveling	None										
Wirth	2/14/19	10:00 AM	2:00 PM	Rain/Windy	11th St	Vibratory Pile Removal	14" Timber Piles	--	--	10:49 AM	CSL	1	Male	AD	1600	155	220	5.5	H	Traveling	None
										11:09 AM	HS	1	Unk	AD	1600	300	605	5	H	Traveling	None
										11:12 AM	CSL	1	Male	AD	1600	185	490	5	H	Traveling	None
										11:19 AM	CSL	2	Male	AD	1600	325	640	5	H	Traveling	None
										11:20 AM	CSL	1	Male	AD	1600	80	360	5	H	Traveling	None
										11:33 AM	HS	1	Unk	AD	1600	110	300	4.75	H	Traveling	None
										12:12 PM	CSL	3	Male	AD	1600	320	635	4	H	Traveling	None
										12:20 PM	CSL	2	Male	AD	1600	260	295	4	H	Traveling	None

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Wirth	2/14/19	10:00 AM	2:00 PM	Rain/Windy	11th St	Vibratory Pile Removal	14" Timber Piles	--	--	1:28 PM	HS	1	Unk	AD	1600	575	800	2.75	H	Traveling	None
Wirth	2/14/19	2:15 PM	4:15 PM	Rain/Windy	11th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	2:15 PM	HS	1	Unk	AD	1600	525	695	2	H	Traveling	None
										2:20 PM	HS	1	Unk	AD	1600	1240	970	2	H	Traveling	None
										2:25 PM	CSL	2	Male	AD	1600	275	575	1.75	H	Traveling	None
										2:25 PM	CSL	1	Unk	AD	1600	200	240	1.75	H	Traveling	None
										2:30 PM	CSL	1	Unk	AD	1600	100	390	1.75	H	Traveling	None
										3:40 PM	CSL	1	Unk	AD	1600	300	620	0.5	H	Traveling	None
										3:47 PM	CSL	2	Unk	AD	1600	320	640	28	M	Traveling	None
4:00 PM	HS	1	Male	AD	1600	350	340	15	M	Traveling	None										
Doschka	2/19/19	9:10 AM	400 PM	Light Rain/Windy	11th St	Vibratory Pile Install/Removal	24" Steel Piles or 36" Steel Casings	--	--	9:10 AM	CSL	1	Male	AD	1600	400	450	6.75	H	Traveling	None
										9:20 AM	CSL	1	Male	AD	1600	350	350	6.75	H	Traveling	None
										10:30 AM	CSL	3	Male	AD	1600	350	400	5.5	H	Traveling	None
										10:35 AM	CSL	2	Male	AD	1600	125	100	20	M	Traveling	None
										10:40 AM	CSL	2	Male	AD	1600	375	425	5.25	H	Traveling	None
										11:05 AM	CSL	2	Male	AD	1600	350	400	5	H	Traveling	None
										11:20 AM	HS	1	Unk	AD	1600	225	200	4.75	H	Traveling	None
										3:24 PM	CSL	1	Male	AD	1600	350	400	0.5	H	Traveling	None
3:30 PM	HS	1	Male	AD	1600	200	250	0.5	H	Traveling	None										
Doschka	2/22/19	12:00 PM	2:00 PM	Rain/Windy	11th St	Impact Pile Driving	24" Steel Piles	7.5 MIN	14	12:01 PM	HS	1	Unk	AD	398	200	300	2	H	Traveling	None
										12:01 PM	CSL	1	Male	AD	398	400	10	2	H	Traveling	None
										12:08 PM	CSL	1	Male	AD	398	350	50	2	H	Traveling	None
										12:14 PM	CSL	1	Male	AD	398	300	100	1.75	H	Traveling	None
										12:30 PM	CSL	2	Male	AD	398	350	50	1.5	H	Traveling	None
										12:41 PM	CSL	1	Male	AD	398	400	150	1.25	H	Traveling	None
										12:46 PM	CSL	1	Male	AD	398	350	100	1.25	H	Traveling	None
										12:57 PM	CSL	3	Male	AD	398	350	100	5	M	Traveling	None

ASTORIA WATERFRONT MARINE MAMMAL MONITORING DATA

PSO	DATE	MONITORING START TIME	MONITORING END TIME	WEATHER CONDITIONS	BRIDGE CONSTRUCTION LOCATION	CONSTRUCTION ACTIVITY	PILE TYPE	AVERAGE IMPACT HAMMER DRIVE TIME	NUMBER OF 24" STEEL PILES INSTALLED	OBSERVATION TIME	SPECIES	COUNT	SEX	AGE	MONITORING ZONE	DISTANCE TO CONSTRUCTION	DISTANCE TO OBSERVER	ESTIMATED TIME MAMMAL OBSERVED IN MONITORING ZONE	HR(H)/MIN(M)/SEC(S)	BEHAVIOR	REACTION
Doschka	2/22/19	12:00 PM	2:00 PM	Rain/Windy	11th St	Impact Pile Driving	24" Steel Piles	7.5 MIN	14	1:00 PM	CSL	2	Male	AD	398	350	150	5	M	Traveling	None
										1:05 PM	CSL	3	Male	AD	398	400	200	2	M	Traveling	None
										1:15 PM	CSL	3	Male	AD	398	400	150	2	M	Traveling	None
										1:38 PM	CSL	5	Male	AD	398	400	10	20	M	Traveling	None
Benson	2/22/19	12:00 PM	2:00 PM	Rain/Windy	11th St	Impact Pile Driving	24" Steel Piles	7.5 MIN	14	12:01 PM	CSL	1	Male	AD	398	285	290	2	H	Traveling	None
										12:02 PM	CSL	1	Male	AD	398	250	320	2	H	Traveling	None
										12:04 PM	CSL	1	Male	AD	398	70	25	2	H	Traveling	None
										12:05 PM	CSL	1	Male	AD	398	50	85	2	H	Traveling	None
										12:08 PM	CSL	1	Male	AD	398	60	75	1.75	H	Traveling	None
										12:12 PM	CSL	1	Male	AD	398	95	20	1.75	H	Traveling	None
										12:20 PM	CSL	1	Male	AD	398	300	320	1.75	H	Traveling	None
										12:26 PM	CSL	1	Male	AD	398	275	305	1.5	H	Traveling	None
										12:33 PM	CSL	1	Male	AD	398	345	385	1.5	H	Traveling	None
										12:40 PM	CSL	2	Male	AD	398	85	120	1.25	H	Traveling	None
										12:42 PM	CSL	2	Male	AD	398	240	300	1.25	H	Traveling	None
										12:48 PM	CSL	1	Male	AD	398	250	245	1.25	H	Traveling	None
										1:05 PM	CSL	1	Male	AD	398	210	280	1	H	Traveling	None
										1:12 PM	CSL	1	Male	AD	398	115	175	0.75	H	Traveling	None
										1:15 PM	CSL	1	Male	AD	398	280	340	0.75	H	Traveling	None
										1:18 PM	CSL	2	Male	AD	398	130	130	0.75	H	Traveling	None
										1:21 PM	CSL	1	Male	AD	398	50	70	0.75	H	Traveling	None
										1:34 PM	CSL	1	Male	AD	398	70	65	26	M	Traveling	None
										1:38 PM	CSL	1	Male	AD	398	120	135	22	M	Traveling	None
										1:42 PM	CSL	1	Male	AD	398	80	20	18	M	Traveling	None
1:47 PM	CSL	1	Male	AD	398	65	30	13	M	Traveling	None										
1:53 PM	CSL	1	Male	AD	398	280	340	7	M	Traveling	None										