

Protected Species
Preliminary Monitoring Report
October – December 2020
DRAFT

Alaska Department of Transportation and Public Facilities
Ferry Berth Improvements: Phase 1
Tongass Narrows, Ketchikan, Alaska

December 28, 2020

Submitted to:
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1 INTRODUCTION

1.1 BACKGROUND

On December 20, 2019, The National Marine Fisheries Service (NMFS) presented Alaska Department of Transportation and Public Facilities (DOT&PF) with an Incidental Harassment Authorization (IHA) under section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA; 16 U.S.C. 1371(a)(5)(D)) to harass marine mammals incidental to pile driving, pile removal, and drilling for Phase 1 work (new Revilla ferry berth (SFHWY00085) and the new Gravina ferry berth (SFHWY00109), layup and maintenance facility (SFHWY00152), and freight facility (SFHWY00154)) in Tongass Narrows near Ketchikan, Alaska. The Phase 1 IHA is valid for one year from March 1, 2020 to February 28, 2021.

Under the IHA, NMFS granted Level A and Level B take of a small number of Steller sea lions (*Eumetopias jubatus*), harbor seals (*Phoca vitulina*), harbor porpoise (*Phocoena phocoena*), Dall's porpoise (*Phocoenoides dalli*), Pacific white-sided dolphins (*Lagenorhynchus obliquidens*), killer whales (*Orcinus orca*), humpback whales (*Megaptera novaeangliae*), and minke whales (*Balaenoptera acutorostrata*) (Table 1).

The 'takes' granted for this project were generated based upon stock assessment completed by NMFS, direct consultation with NMFS, and observations from another other projects in Tongass Narrows. Action areas were based off of consultation with NMFS and various literary sources. Mitigation included NMFS-approved Protected Species Observers (PSOs) monitoring the Level A and Level B take areas, recording species, and shutting down in-water work if the abovementioned species or any other marine mammal species approached or appeared likely to enter the any designated shutdown area (Tables 2 and 3).

TABLE 1. Authorized Marine Mammal Takes During Tongass Narrows Ferry Berth Improvements: Phase 1

Species	DPS/Stock	Exposures to Level B Harassment	Exposures to Level A Harassment	Total Exposures (Level A and Level B Harassment)
Steller sea lion	Eastern DPS	2,025	0	2,025
Harbor seal	Clarence Strait	861	18	879
Harbor porpoise	Southeast Alaska	112	15	127
Dall's porpoise	Alaska	327	15	342
Pacific white-sided dolphin	North Pacific	92	0	92
Killer whale	Alaska resident Northern Resident West Coast Transient	144	0	144
Humpback whale	Hawaii DPS Mexico DPS	246 16	0 0	246 16
Minke whale	Alaska	7	0	7

In-water construction under the Tongass Narrows Ferry Berth Improvements Phase 1 began on Revilla New Ferry Berth on October 28, 2020 under mitigation measures detailed in the IHA and NMFS approved Marine Mammal Monitoring and Mitigation Plan (4MP) designed to prevent 'take' of Marine Mammal Protection Act (MMPA) and ESA-protected marine species.

This documents purpose is to meet the preliminary monitoring report requirements outlined in the section 8(b)(ii) of the NMFS IHA issued to DOT&PF under the authority of Section 101 (a)(5)(D) of the MMPA.

1.2 PROJECT OVERVIEW AND LOCATION

In 2020, construction occurred on the Revilla Ferry Berth in Tongass Narrows in Ketchikan, Alaska at approximately Latitude: 55° 21' 32.9"N, Longitude: 131° 42' 9.8"W (Figure 1). Between October and December, piles were installed using a vibratory hammer and impact hammer. Each of these methods and pile sizes required varying monitoring zones, Level A shutdown zones, and Level B shutdown zones (Table 2 and Figure 2).

FIGURE 1. Tongass Narrows Ferry Berth Improvements: Phase 1 Revilla New Ferry Berth Project Location

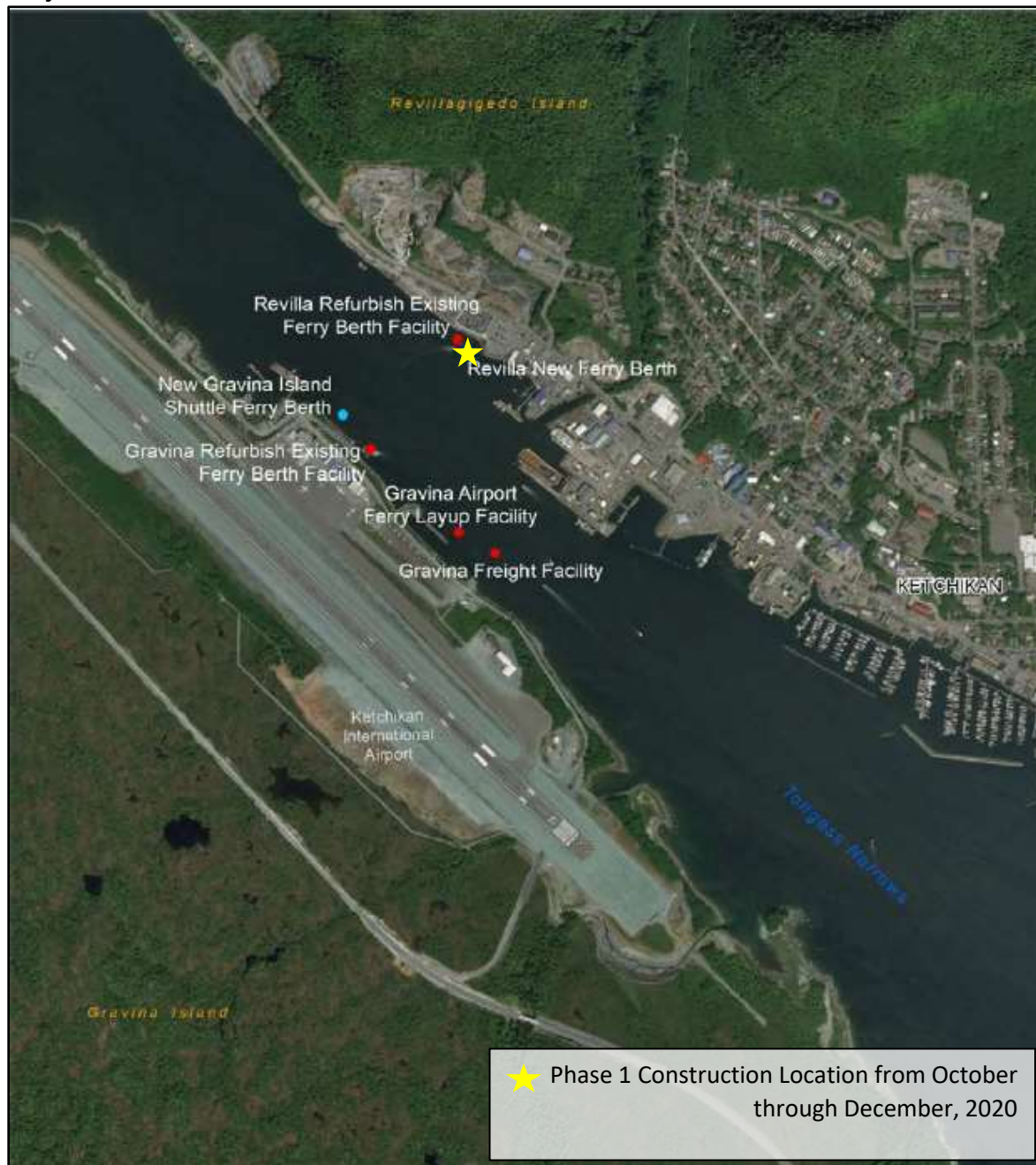


TABLE 2. Tongass Narrows Ferry Berth Improvements: Phase 1 Shutdown Zones

Activity	Pile Size (Inches)	Minutes per pile or Strikes per Pile	Piles Installed/Removed per Day	Level B Harassment Isopleth (m)	Shutdown Distances (m)				
					LF	MF	HF	PW	OW
Vibratory Installation	30	30 min	3	6,310	50				
	24, 18	30 min	3	5,420					
	27.6 & 30.3 sheet	15 min	10	4,650					
Vibratory Removal	24, 16	30 min	5	5,420					
Drilling Rock Sockets	30	180 min	3	12,030	70	50	60	50	
	24, 18	120 min	3		60	50			
Impact Installation	30	50 strikes	3	2,160	250	50	250	150	50
			2		200		200	100	
			1		100		150	100	
		200 strikes	3		550		650	300	
			2		400		500	250	
			1		300		300	150	
	24	50 strikes	3	1,000	150		150	100	
			2		100		150	50	
			1		100		100	50	
		200 strikes	3		300		350	200	
			2		250		300	150	
			1		150		200	100	
	18	50 strikes	3		150		150	100	
			2		100		150	50	
			1		100		100	50	

TABLE 3. Tongass Narrows Ferry Berth Improvements: Phase 1 Monitoring Zones

Method and Pile Type	Distance to Level B Harassment Isopleth (meters)
Vibratory Hammer (Level B Harassment Isopleth = 120dB)	
30-inch steel piles	6,400
24-inch steel piles	5,500
18-inch steel piles	5,500
16-inch steel piles	5,500
27.6-inch sheet piles	4,700
30.3-inch sheet piles	4,700
Drilling Rock Sockets (Level B Harassment Isopleth = 120 dB)	
All pile types	12,050
Impact Hammer (Level B Harassment Isopleth = 160 dB)	
30-inch steel piles	2,200
24-inch steel piles	1,000
18-inch steel piles	1,000

FIGURE 2. Tongass Narrows Ferry Berth Improvements: Phase 1 Construction NMFS-Approved PSO locations, Monitoring Zones, and Shutdown Zones (2020)



2 MARINE MAMMAL MONITORING METHODS

The Protected Species Observer (PSO) followed mitigation measures detailed in the Marine Mammal Monitoring and Mitigation Plan (4MP) approved by NMFS, which was updated to reflect the conditions of the IHA issued in December 2019. The monitoring and mitigation protocols were established in order to minimize impacts to marine mammals in the vicinity of the ferry terminal projects. Visual observations allowed for the adherence of the shutdown areas, documentation of take, and collection of data for use in future activities. All data collected by PSOs are located in Attachment A.

When in-water work began on October 28, 2020, two qualified and NMFS-accepted PSOs scanned the area for marine mammals, recorded and reported sightings, and implemented mitigation actions (shut downs) in accordance with the IHA throughout the project. To mitigate for barge positions that prevented a full view of the action area, a third NMFS-approved observer was added on November 12, 2020. See Figure 2 for observer locations.

The PSOs also performed a 30-minute watch prior to the start of and at the conclusion of any in water work and consistently observed the areas while all in water work occurred. The three land-based PSOs had a clear view of the action areas and had a nearly full view of Tongass Narrows (Figure 2).

The PSOs were equipped with binoculars, a rangefinder, radio, cell phone, and GPS unit. Guidelines for observers to mitigate for fatigue were closely followed. If a marine mammal was sighted, the observer would identify and record the species. If the marine mammal appeared to be likely to enter a shutdown area, the superintendent was notified by the lead observer and in water work was halted and delayed until the marine mammal left the area for 15 minutes (pinnipeds) and 30 minutes (cetaceans) had passed after the last sighting within or near the action area.

The PSOs recorded the following information for each protected species observation:

- Species, date, and time for each sighting event.
- Number of animals per sighting event (adults/juveniles/calves).
- Primary, and if observed, secondary behaviors of the marine mammal.
- Geographic coordinates for the observed animals.
- Time of the most recent pile-driving activity or other project activity prior to sighting.
- Weather and water conditions (i.e. sea state, visibility, lighting conditions, etc.).

When a protected species was observed, distance estimates were made using a rangefinder, the naked eye, and by relating the animal's proximity to an object at a known distance. Species and sex determinations were attempted by observing anatomical features and behaviors. Identifications were confirmed and recorded.

Based upon the location, timeframe, behavior, and tracking movement, observers were able to positively determine if an individual or group was being resighted. If an individual or group was resighted, a note was made on the sighting form to ensure that additional takes or sightings were not counted again. If it could not be positively determined whether it was the same individual or group, the individual or group was counted as a new sighting and an additional take, if appropriate.

A detailed description of monitoring methods is documented in *Marine Mammal Monitoring and Mitigation Plan for Ketchikan Revilla and Gravina Airport Ferry Facility Improvements* (Appendix A).

3 RESULTS

3.1 GENERAL MONITORING AND CONSTRUCTION ACTIVITIES

A total of twenty-three (23) days of in-water work occurred from October 28, 2020 to December 30, 2020. During that time, thirteen (13) 24-inch permanent piles, seven (7) 20-inch temporary piles (one removed), four (4) 12-inch, and twenty-two (22) 27.6-inch using a vibratory hammer and impact hammer (Table 4). PSOs were on duty during every day of in-water work.

Appendix B and C details the dates, times, construction activities, and pile information for each marine mammal monitoring period.

TABLE 4. Number of In-Water Work/Marine Mammal Monitoring Days and Piles Driven in 2020 by Month During Tongass Narrows Ferry Berth Improvements: Phase 1 Construction

Month	Number of Days	Hours Monitored	Number of Piles*	Pile Size	Pile Type	Pile Driving Method(s)
October	3	16 hrs 33 mins	3 (1 removed)	20-inch	Temporary	Vibratory and Impact Hammer
November	9 driving 2 monitor only	44 hrs 26 mins	4	20-inch	Temporary	Vibratory and Impact Hammer
			4	12-inch	Temporary	Vibratory and Impact Hammer
			22	27.6-inch sheets	Permanent	Vibratory Hammer
December	11 driving 1 monitor only	41 hrs 43 mins	13	24-inch	Permanent	Vibratory Hammer
			6	27.6-inch sheets	Permanent	Vibratory Hammer

**Piles may have required multiple methods of installation and may have been worked on multiple times/days throughout the project to achieve design embedment.*

3.2 WEATHER PARAMETERS AND WATER CONDITIONS

Environmental conditions including weather parameters and water conditions were recorded at the start of each monitoring period and when conditions changed. The sea state, visibility, glare, and weather conditions occasionally varied on a daily basis and could sometimes vary slightly between monitoring locations. Conditions were generally favorable throughout the duration of the project; although there were a few days when construction was stopped or did not start for the day because of the weather. Table 5 provides a general overview of conditions during each month of in-water work in 2020. A full log of conditions per day is located in Attachment B and C.

TABLE 5. Environmental Conditions During Each Month During Tongass Narrows Ferry Berth Improvements: Phase 1 Construction in 2020

Month	Average Temperature	Visibility	Beaufort Sea State (range)	Average Wind Speed (mph)
October	44.3°F	Excellent	1	5.3
November	37.9°F	Poor-Excellent	0-4	9.1
December	41°F	Poor-Excellent	0-6	10.2

(Source: NOAA 2020)

3.3 MARINE MAMMAL MONITORING RESULTS

3.3.1 Overview

Since work started on October 28, 2020, 72 sighting events have occurred with 66 individuals recorded. PSOs carefully watched the designated shutdown and monitoring zones to prevent any unauthorized takes, a total of 4 sightings resulted in the delay or shutdown of in-water work. A total of 17 Level B takes occurred, and no Level A takes were needed.

Harbor seals and Steller sea lions were observed on most days of observation. A lone humpback whale was observed feeding and milling within Tongass Narrows on 11 separate days. A pod of killer whales and a pod of Dall's porpoises were both observed on November 13, but not at any other time.

October had the least amount of observation days (three) and marine mammal sightings (two). November had almost twice as many marine mammal sightings as December. Additionally, there was more diversity of species in November (five species sighted) than December (three species sighted). The numbers and diversity of sightings do not appear to be correlated to observation hours or days, since there was only one more day but about 3 fewer hours of observation in December.

A summary of observations per month is located in Table 6.

TABLE 6. Summary of Recorded Observations by Month During Tongass Narrows Ferry Berth Improvements: Phase 1 Construction in 2020

Month	Sighting Events	Individuals Sighted	Number of Species	Sightings with Mitigation Measures	Level B Takes
October <i>(3 days; 16 hrs 33 mins)</i>	2	2	2	1	0
November <i>(11 days; 44 hrs 26 mins)</i>	43	38	5	3	6
December <i>(12 days; 41 hrs 43 mins)</i>	27	26	3	0	11
Total	72	66	-	4	17

Summary take information for each month per species is in Table 7. Table 8 summarizes total take over the course of the construction and the remaining take when construction ended.

TABLE 7. Daily and Total Take Numbers by Species During Tongass Narrows Ferry Berth Improvements: Phase 1 Construction in 2020

Species	10/1	10/2	10/3	10/4	10/5	10/6	10/7	10/8	10/9	10/10	10/11	10/12	10/13	10/14	10/15	10/16	10/17	10/18	10/19	10/20	10/21	10/22	10/23	10/24	10/25	10/26	10/27	10/28	10/29	10/30	10/31	Monthly Total	
Steller Sea Lion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Harbor Seal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Harbor Porpoise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Dall's Porpoise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pacific White-sided Dolphin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Killer Whale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Humpback Whale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Minke Whale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Species	11/1	11/2	11/3	11/4	11/5	11/6	11/7	11/8	11/9	11/10	11/11	11/12	11/13	11/14	11/15	11/16	11/17	11/18	11/19	11/20	11/21	11/22	11/23	11/24	11/25	11/26	11/27	11/28	11/29	11/30		Monthly Total	
Steller Sea Lion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	
Harbor Seal	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		1	
Harbor Porpoise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	
Dall's Porpoise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	
Pacific White-sided Dolphin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	
Killer Whale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	
Humpback Whale	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0		5
Minke Whale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	
Species	12/1	12/2	12/3	12/4	12/5	12/6	12/7	12/8	12/9	12/10	12/11	12/12	12/13	12/14	12/15	12/16	12/17	12/18	12/19	12/20	12/21	12/22	12/23	12/24	12/25	12/26	12/27	12/28	12/29	12/30	12/31	Monthly Total	
Steller Sea Lion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Harbor Seal	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	8	
Harbor Porpoise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Dall's Porpoise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pacific White-sided Dolphin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Killer Whale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Humpback Whale	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Minke Whale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

TABLE 8. Total Level B Takes Per Species During Tongass Narrows Ferry Berth Improvements: Phase 1 Construction in 2020

Species	Level B			Level A		
	Actual	Allowed	Remain	Actual	Allowed	Remain
Steller sea lion	2	2,025	2,023	0	0	0
Harbor seal	9	861	852	0	18	18
Harbor porpoise	0	112	112	0	15	15
Dall's porpoise	0	327	327	0	15	15
Pacific white-sided dolphin	0	92	92	0	0	0
Killer whale	0	144	144	0	0	0
Humpback whale	6	262	256	0	0	0
Minke whale	0	7	7	0	0	0
TOTAL	17	3,830	3,813	0	48	48

Note: No Level A takes occurred

3.3.2 Steller Sea Lions

A total of twenty (20) Steller sea lions were sighted on twelve separate days during in-water work. Two sightings in December resulted in level B takes. All sightings were recorded and none resulted in mitigation measures due to their distances from in-water work. Sightings were of single individuals and pairs. They were identified as travelling, foraging, diving, swimming, milling, looking, and sinking. The sex and age of the individuals was not able to be positively determined. No calves were sighted. Sightings and takes per month are detailed below (Table 9).

TABLE 9. Tongass Narrows Ferry Berth Improvements: Phase 1 Steller Sea Lion Sightings and Takes Per Month (2020)

Month	Sighting Events	Individuals Sighted	Sightings with Mitigation Measures	Distance Range from In-water work	Level B Takes
October	1	1	0	1,500m	0
November	9	11	0	1,000m-3,400m	0
December	8	8	0	500m-5,400m	2
Total	18	20	0	500m-5,400m	2

3.3.3 Harbor Seals

Harbor seals were sighted a total of fourteen (14) days in November and December. There were 22 sighting events. Sighting events were of solo individuals and a pair that were identified as looking, sinking, swimming, travelling, and resting. Nine (9) out of the 861 authorized Level B takes were used, and none of the 18 authorized Level A takes were needed. No Mitigation

measures were necessary during 22 sighting events due to each sightings distance from work. The sex and age of the individuals was unable to be determined. Table 10 details sighting data per month.

TABLE 10. Tongass Narrows Ferry Berth Improvements: Phase 1 Harbor Seal Sightings and Takes Per Month (2020)

Month	Sighting Events	Individuals Sighted	Sightings with Mitigation Measures	Distance Range from In-water work	Level B Takes
October	-	-	-	-	-
November	6	6	0	200m-3,400m	1
December	16	17	0	500m-3,400m	8
Total	22	23	0	200m-3,400m	9

3.3.4 Dall's Porpoise

A pod of six Dall's porpoise were sighted on November 13, 2020. The pod was recorded milling and swimming outside of the monitoring zone at approximately 4,200 meters to 5,600 meters from in-water work. Since the pod did not enter or appear likely to enter the monitoring zone, no mitigation measures or Level B takes were needed. The sex and age of the individuals could not be determined, and no calves were sighted.

3.3.5 Killer Whales

On November 13, 2020, a pod of three killer whales (one male and two females) were identified swimming south through the monitoring zone before turning back north approximately 4,500 meters to 5,600 meters from in-water work. The sighting did not require mitigation measures and did not result in any Level A or Level B takes. The age of the individuals could not be determined, and no calves were sighted.

3.3.6 Humpback Whales

Twenty-eight (28) sighting events occurred on eleven (11) days of in-water work. A total of fourteen (14) solo individuals were recorded. It is presumed that the lone humpback was the same individual on all the days because of the markings on its fluke. (This whale is named Phoenix by people in Ketchikan and was photographed a number of times by locals on a Facebook site.) The individual was observed travelling, diving, swimming, foraging, breaching, chuffing, and swimming away from in-water work at 75 meters to 4,200 meters from in-water work. Six (6) authorized Level B takes occurred and four (4) of the twenty-eight (28) sighting events required mitigation measures to prevent unauthorized Level A takes. The sex and age of the individuals was unable to be determined. Table 11 details sighting data per month.

TABLE 11. Tongass Narrows Ferry Berth Improvements: Phase 1 Humpback Whale Sightings and Takes Per Month (2020)

Month	Sighting Events	Individuals Sighted	Sightings with Mitigation Measures	Distance Range from In-water work	Level B Takes
October	1	1	1	1,500m	0
November	26	12	3	75m-3,400m	5
December	1	1	0	400m-4,200m	1
Total	28	14	4	75m-4,200m	6

4 CONCLUSIONS

Based on the preliminary observation data collected during 26 days of pile driving between October 28 and December 20, 2020 (when construction ended for the year), marine mammal takes are not expected to exceed the level authorized under the Phase 1 IHA. No Level A take of any species and, as shown in Table 8, minimal Level B take has occurred. If sightings and takes continue similarly to November and December, takes of marine mammals should be within the authorized numbers at the end of construction activities. DOT&PF is paying close attention to humpback whale takes, since if numbers of takes increase beyond two per day, the authorized number (currently remaining at 262) could be exceeded in about 90 days. Although this is not expected, it is being monitored closely.

5 REFERENCES

National Marine Fisheries Service (NMFS). 2019. Alaska Department of Transportation and Public Facilities Incidental Harassment Authorization. Issued December 20, 2019.

National Oceanic and Atmospheric Administration (NOAA). 2020. National Weather Service: Ketchikan. Accessed from <https://w2.weather.gov/climate/index.php?wfo=pajk>

Attachment A. Marine Mammal Monitoring and Mitigation Plan

Dawson

MARINE MAMMAL MONITORING PLAN

For

KTN: Revilla & Gravina Airport Ferry Facility Improvements

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Plan Approval

This Marine Mammal Monitoring Plan is a living document that can be amended to reflect changes in conditions that develop as the project progresses. All changes will be submitted to the DOT&PF Project Engineer for review and approval.

All work will be done in compliance with the applicable local, state and federal permits.

I acknowledge the contents of this Marine Mammal Monitoring Plan and understand the work practices to be enforced on this project.

Lead Marine Mammal Monitor: _____ Date: _____

David Reynolds Signature

Project Superintendent: _____ Date: _____

Jim Rogers Signature

Project Manager: _____ Date: _____

Dirk deGroot Signature

Expert Reviewer: _____ Date: 9/8/20

Gary Freitag Signature

1 INTRODUCTION

The purpose of this Marine Mammal Monitoring and Mitigation Plan is to describe monitoring procedures for affected marine species and mitigation actions that will be implemented by Dawson Construction (Dawson) during pile installation and removal associated with the KTN: Revilla & Gravina Airport Ferry Facility Improvements (Project).

This Marine Mammal Monitoring and Mitigation Plan was prepared in accordance with the following specification requirements and supplemental information:

- AK DOT Standard Specs for Highway Construction - 2017
- SECTION 654 Marine Mammal Monitoring
- Appendix B-5: Incidental Harassment Authorization
- Appendix B-6: NMFS Biological Opinion
- Appendix B-7: Marine Mammal Monitoring Plan

The overall goal of the Marine Mammal Monitoring and Mitigation Plan is to comply with the Marine Mammal Protection Act and Endangered Species Act during in-water pile installation and removal.

This document establishes the requirements for monitoring and documenting all marine mammals potentially exposed to noise at or above established thresholds to minimizing impacts to marine mammals through the required mitigation measures.

1.1 Project Description

The project consists of four distinct in-water marine components requiring pile installation and or extraction; the approximate work windows for each are as follows:

1. New Revilla Dock Construction: November 2020 through February 2021
2. New Gravina Dock Construction: February 2021 through July 2021
3. Existing Gravina Dock Rehabilitation: June 2021 through September 2021
4. Existing Gravina Dock Rehabilitation: September 2021

The Project will involve removal of some of the existing piles and structure, and the installation of new piles and structure in the marine environment. Proposed activities include drilling of rock sockets into bedrock for steel pipe piles, vibratory removal of steel pipe piles, vibratory and impact installation of steel pipe piles. See Table 1.1 for a breakdown of the activities for each phase.

	24" Pile	30" Pile	Vibratory (extraction)	Vibratory (installation)	Impact	Socketing	Drilling
Revilla - New							
Trestle	X			X	X		
Restraint Dolphin		X		X	X		X
Stern Dolphin		X		X	X		X
Floating Fender Dolphin	X			X	X		X
Gravina - New							
Trestle	X			X	X	X	
Restraint Dolphin	X			X	X	X	X
Stern Dolphin	X			X	X	X	X
Floating Fender Dolphin	X			X	X	X	X
Revilla - Rehabilitation							
Floating Fender Dolphin	X		X	X	X		
Gravina - Rehabilitation							
Floating Fender Dolphin	X		X	X	X	X	X
4-Pile Dolphin	X		X	X	X	X	X

Table 1.1: Breakdown of pile driving activities per phase of work.

The Project has the potential to generate elevated levels of underwater and in-air noise that could exceed the Level A (injury) and Level B (disturbance) harassment thresholds in the Project specifications.

1.2 Protected Marine Mammals

The marine mammals identified in Table 1.2 have been identified in the project specifications as authorized takes.

Species	PHASE I			PHASE II		
	Allowable Exposures to Level B Harassment	Allowable Exposures to Level A Harassment	Total Exposures	Allowable Exposures to Level B Harassment	Allowable Exposures to Level A Harassment	Total Exposures
Steller sea lion	2025	0	2025	450	0	450
Harbor seal	861	18	879	162	9	171
Harbor porpoise	112	15	127	30	10	40
Dall's porpoise	327	15	342	45	15	60
Pacific white-sided dolphin	92	0	92	92	0	92
Killer whale	144	0	144	60	0	60
Humpback whale-Hawaii DPS	246	0	246	15	0	15
Humpback whale-Mexico DPS	16	0	16	1	0	1
Minke whale	7	0	7	3	0	3

Table 1.2: Authorized take numbers by species and stock per phase. Dawson will work with the PSO Coordinator and MMOs to keep track of take numbers and coordinate with other projects.

The taking, by Level A harassment, Level B harassment, serious injury or death of marine mammal species not identified in Table 1.2 is prohibited. In the event a species for which authorization has not been granted, or a species for which authorization has been granted but the authorization takes are met, is observed approaching or within the monitoring zone, pile driving and removal activities will be shut down immediately.

2 MARINE MAMMEL MONITORING AND MITIGATING MEASURES

The complete list of required avoidance, minimization, and mitigation measures can be found in the Project IHAs and NMFS Biological Opinion. Avoidance and minimization measures described here include establishment of Level A and Level B harassment zones, marine mammal monitoring, and specific mitigation measures that will be implemented during in-water pile installation and removal.

2.1 Level A and Level B Harassment Zones

During in-water pile installation, removal, or drilling, Dawson will monitor for all marine mammals within or approaching the Level A and Level B harassment zones. Monitoring all harassment zones, including the outer margins, enables trained Marine Mammal Observers (MMOs) to be aware of and communicate the presence of marine mammals in the Project area and thus prepare for potential shutdown of activity and documentation of exposures (takes).

Distances to the Level A and Level B harassment zones are defined by the IHA and BO in the contract specifications. Single hammer Level A and Level B zones are identified in Table 2.1, below.

Activity	Pile Size (inch)	Minutes or Strikes per Pile	Piles Installed or Removed per Day	Level B Harassment Zone (m)	Level A Shutdown Zone - maximum (m)
Vibratory Installation	30	30 min	3	6,400	50
	24	30 min	3	5,500	50
Vibratory Extraction	24	30 min	5	5,500	50
Drilling Rock Sockets	30	180 min	3	12,050	70
	24	120 min	3		70
Impact Installation	30	50 strikes	3	2,200	250
			2		200
			1		150
		200 strikes	3		650
			2		500
	24	50 strikes	1	1,000	300
			3		150
			2		100
		200 strikes	1		350
			3		350
			2		300
			1		200

Table 2.1: Level B Harassment Zones for All Species and maximum Level A shutdown zones during Single Hammer Operations as defined by the IHA.

Using Attachment 1: Simultaneous Sound Level Worksheets – Phase 1, in the biological opinion, combined sound levels generated during pile installation and removal for simultaneous vibratory/impact and drilling can be estimated. The remaining Simultaneous Sound Level Worksheets, found in Attachment 1, can be found in Appendix C.

Table 2.2 will be used if two piles are installed/removed simultaneously. NA is marked when combinations of equipment not possible given construction plans for each component.

Method	Pile Diameter		Vibratory					Drilling		Impact		
			Sheet	18	20	24	30	24	30	18/20	24	30
	SSL		160	161	161	161	162	166	166	190	190	195
Vibratory	Sheet	160	163	164	164	164	164	167	167	No Addition (Level B = Vibratory, Level A = Impact)		
	18	161	164	NA		164	165	167	167			
	20	161	164			164	165	167	167			
	24	161	164	164	164	164	165	167	167			
	30	162	164	165	165	165	165	167	167			
Drilling	24	166	167	167	167	167	167	169	169			
	30	166	167	167	167	167	167	169	169			
Impact	18/20	190	No Addition (Level B = Vibratory, Level A = Impact)							No Addition		
	24	190										
	30	195										

Table 2.2: Combined sound levels generated during pile installation for a combination of two pieces of equipment: impact hammer, vibratory hammer and down-hole drill. It is anticipated that there will be simultaneous drilling/vibratory driving and drilling/impact driving during the project; these areas are highlighted accordingly.

From IHA Table 4, the Level B Harassment Isopleth can be calculated for the 167 SSL (dB) for simultaneous vibratory pile installation and drilling, as seen in Table 2.3, below.

Combined SSL (dB)	Distance to Level B Harassment Isopleth (m)
163	7356
164	8577
165	10000
166	11659
167	13594
168	15849
169	18478
170	21544

Table 2.3: Level B harassment monitoring zones for combinations of two and three piles of different sizes, types and installation methods.

Shutdown zones have been defined for the Project to reduce the number of Level A zones and simplify implementation at the Project site by MMOs, and to further reduce the likelihood of Level A take. Like Level A zones, shutdown zones may differ by pile installation method and species functional hearing group. Every effort will be made to shut down before marine mammals enter the shutdown zones.

All movements of marine mammals into and out of the Level A zones will be documented to make this determination. See table 2.1 for the maximum level A shutdown distance per the 4MP.

In addition, a 10-meter shutdown zone will be implemented for all species and all activity types to prevent direct contact of marine mammals with construction equipment. On days when combinations of one down-hole drill with a vibratory hammer, two down-hole drills, or two down-hole drills with a vibratory hammer are used simultaneously, a 100-meter shutdown zone will be implemented for each vibratory hammer and each down-hole drill.

2.2 Marine Mammal Monitoring Measures

To minimize potential impacts of Project activities on marine mammals, MMOs (referred to as Protected Species Observers or PSOs in contract documents) will be present during all pile installation and removal using impact and vibratory methods and rock socket drilling.

MMOs' will act in accordance with the rules stipulated in the Project IHA, however the general requirements are as follows:

1. The MMOs' ONLY responsibilities will be to search for, monitor, document, and track marine mammals (i.e. not welding or putting together forms).
2. A designated Lead MMO will always be on site and will remain responsible for implementing the Monitoring Plan for in-water pile installation and removal for the Project.
3. Marine mammal monitoring must take place from 30 minutes prior to initiation of pile driving, removal, and drilling through 30 minutes post-completion of this activity.
4. Pile installation and removal will only occur during daylight hours.
5. MMOs' will not perform duties for more than 12 hours in a 24-hour period.
6. If waters exceed a sea state that restricts the MMOs' ability to make observations within the Level A harassment zones (e.g. excessive wind or fog), pile installation and removal will be shut down and only re-initiated once Level A harassment zones are visible.
7. If conditions such as low light, high sea state, fog, ice, rain, glare, or other conditions prevent effective marine mammal monitoring of the entire Level B harassment zone in-water pile installation and removal may be continued if MMOs continue to monitor the visible portion of the Level B harassment zone throughout the duration of pile installation and removal.

MMOs will understand their roles and responsibilities before beginning observations. A clear authorization and communication system will be in place to ensure that MMOs and construction crew members understand their respective roles and responsibilities.

2.2.1 Positioning

Observation points are available from the Tongass Highway and Gravina Airport Access Road where it is possible to observe the entire width of Tongass Narrows with unaided eyes.

Per the IHA, there must be a minimum of two observers at each active driving site to actively observe monitoring and shutdown zones during all pile driving, pile removal, and drilling. MMOs will be positioned at the best practical vantage points; the MMOs' will be located:

1. The Lead MMOs will be located on the pile installation/removal rig and be able to observe the entire shutdown zone under normal conditions and communicate with construction personnel about shutdowns and take management.
2. One MMO will be stationed along the Tongass Narrows as the best practical vantage point to observe the monitoring zone required by the activities performed.

3. When combinations of hammers and drills are used, creating a Level B harassment zone greater than 12,023 meters, one additional MMO will be positioned on the northernmost land-based location to the Tongass Narrows. This MMO will monitor the Clarence Strait, watching for marine mammals that could swim through the ensonified area. This MMO will be joined by the MMO identified in (2), who will watch for marine mammals that could approach or enter Tongass Narrows.

All MMOs will be in constant radio contact with one another, and the lead MMO will be in contact with the construction team to request a work stoppage, if necessary.

MMOs stationed along the road system will watch for marine mammals entering and leaving Tongass Narrows. MMOs will monitor for marine mammals approaching the Level B harassment zones from the north or south and will alert the lead MMO of the number and species sighted, so that no unexpected marine mammals approach the construction site.

See Appendix A: MMO Locations for location of Lead MMO and MMO during operations on Revilla and Gravina.

2.2.2 Daily Monitoring Protocol

At the start of each day, Dawson will hold a briefing with the Lead MMO to outline the activities planned for that day. The MMOs will begin observations 30 minutes prior to the start of pile installation and removal (includes the start of the day and any break in activity longer than 30 minutes) and at least 30 minutes following completion of pile installation and removal.

Before departing, each MMO will be given the equipment identified in Section 4.3 Equipment.

Once the Lead MMO confirms, by radio or phone, that the remote MMO(s) are in place, and have been monitoring for at least 30 minutes, pile installation or removal operations may begin.

The MMOs will use a rangefinder to verify distance and a GPS or compass to verify heading when a marine mammal is observed; a full list of equipment required can be found in *Section 4.3 Equipment*.

Each MMO will record on their daily reports the information identified in *DATA COLLECTION*.

Each MMO will work between 6 and 12 hours in a given 24-hour period, and will be onsite up to 6 days per week. The pile driving is expected to be intermittent, allowing the PSO to take breaks during their shift.

Appendix B: Example Data Forms includes the daily reporting forms each MMO will record this information on.

2.2.3 Extrapolation of Takes

When the Level B harassment zones extends into Clarence Strait or the entire monitoring zone is not visible, extrapolation methods may be used to estimate take of marine mammals. Estimated numbers of individuals will be extrapolated by dividing the number of observed individuals by the percentage of the monitoring zone in that was visible.

Example:

If wind and sea state increase, causing visibility to diminish to a point that only 50 percent of the Clarence Strait portion of the monitoring zone is visible, and two humpback whales are observed entering that portion of the Level B zone, the MMO will estimate that four humpback whales are present in the Level B zone in Clarence Strait (2 whales observed in Level B zone ÷ 50 percent of zone visible = 4 whales estimated to be within Level B zone).

No more than four humpback whales are expected to occur in Clarence Strait in a day. Therefore, unless direct counts exceed four individuals, four is the maximum number of humpback whales assumed to be present in Clarence Strait when extrapolation methods are used.

2.3 Mitigation Measures for In-Water Pile Installation and Removal

Avoidance and minimization measures described here include soft starts, establishment of Level A and Level B harassment zones, and marine mammal monitoring. To minimize the effects of in-water pile installation and removal on marine mammals, the following measures will be observed:

2.3.1 General Requirements

- Pile installation, proofing, and removal will occur only during daylight hours, when visual monitoring of marine mammals can be conducted.
- If a marine mammal approaches within 10 meters of a Project vessel (e.g., barge, tugboat), the vessel shall reduce speed to the minimum level required to maintain safe steering and working conditions until the marine mammal is at least 10 meters away from the vessel.

2.3.2 Soft Start Techniques

- Dawson will use soft start techniques when impact pile driving. Soft start will be accomplished by providing an initial set of three strikes at reduced energy, followed by one-minute waiting period, then two subsequent reduced energy strike sets. Soft start will be implemented at the beginning of each day and any time following cessation of impact pile driving for a period of thirty minutes or longer.
- Soft start will only be initiated after the Level A harassment zone is determined clear; if a marine mammal is present in the Level B harassment zone, soft start may begin, and a Level B harassment take will be recorded.
- Optional: to avoid a Level B take, ramping up will begin only after the MMO has determined, through sighting or if 15 minutes (30 minutes for humpback whale) has passed without a re-sighting, that the animal has moved outside the Level B harassment zone.

2.3.3 Level A and Level B Harassment Zones

- Shutting down pile installation or removal when a marine mammal is approaching or observed within a defined Level A or Level B harassment zone will be used to avoid take.
- If a marine mammal authorized for Level B take is present in the Level B harassment zone, in-water pile installation and removal may continue, and a Level B take will be recorded. Pile installation and rock socket drilling may occur when these species are in the Level B harassment zone, whether they entered the Level B zone from the Level A zone (if relevant), or from outside the Project area.

- If Level A or Level B take for a species reaches the authorized limit, pile installation will be stopped as individuals of this species approach the relevant zones, to avoid additional take of this species.
- For those marine mammal species for which Level B take has not been requested, in-water pile installation and removal and drilling will shut down before they enter the Level B harassment zone to avoid unauthorized Level B take.
- If a marine mammal is entering or is observed within an established shutdown zone, pile installation and removal must be halted or delayed. Pile driving may not commence or resume until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone; or 15 minutes (30 minutes for humpback whales) have passed without subsequent detections of the animal.

3 MARINE MAMMAL OBSERVER QUALIFICATIONS

All MMOs will undergo project-specific training in monitoring, data collection, and mitigation procedures specific to the Project. This training will also include communication protocols.

All MMOs must be capable of spotting and identifying marine mammals and documenting applicable data during all types of weather, including rain, sleet, snow, and wind.

At a minimum, all MMOs will have or meet the following qualifications:

- MMOs will be independent observers not engaged in construction activities.
- MMOs' visual acuity (correction is permissible) will be sufficient to allow detection and identification of marine mammals at the water's surface; use of binoculars may be necessary to correctly identify a sighting to species.
- MMOs will demonstrate ability to conduct field observations and collect data according to assigned protocols (this may include academic training and/or previous field experience).
- MMOs will have documented marine mammal monitoring experience or training, or an undergraduate degree in biological science or a related field. Project-specific training for this Project will meet the training requirement if the MMO has experience identifying marine mammals to species.
- MMOs will have sufficient training, orientation, or experience with construction operations to provide for personal safety during observations.
- MMOs will have the ability to communicate orally, by radio or in person, with project personnel about marine mammals observed in the area.
- MMOs will have the ability to collect the required marine mammal observation data as detailed in *DATA COLLECTION*.

A designated Lead MMO will always be on site and will remain responsible for implementing the Marine Mammal Monitoring Plan for in-water pile installation and removal for the Project. The lead observer must have education and experience that demonstrates qualifications to serve as the lead, including the following:

- Education in wildlife observation techniques from a university, college, or other formal education program.
- Writing skills sufficient to prepare daily activity logs and monthly and final reports
- Previous professional marine mammal observation experience during construction.

3.1 Resumes

Gray Freitag (<https://sites.google.com/a/alaska.edu/gary-freitag/>), Professor of Oceanography and Marine Advisory Agent will oversee the development and implementation of the Marine Mammal Monitoring program.

Primary Lead MMO: David Reynolds
Alternate Lead MMO: Ashley Ruis

MMO-A: TBD
MMO-B: TBD
MMO-C: TBD

A minimum of 30-days prior to start of work Dawson will furnish the Engineer with the name of the proposed marine mammal monitors and the monitors' Curriculum Vitae (CVs). No in-water work shall occur until Dawson has received approval of the marine mammal monitors' CVs by the Engineer.

Resumes may be found in Appendix D; additional resumes will be submitted as an addendum to this plan.

4 DATA COLLECTION

4.1 Environmental Conditions and Construction Activity

MMOs will use the environmental conditions and construction activities log to document environmental conditions, types of construction activities, and other human activity in the area (Appendix B).

Environmental conditions will be recorded in the following increments:

- At the beginning and end of every monitoring period
- At every half hour
- As conditions change

Data collected will include the following:

- MMO name
- Location of the observation station
- Time and date of the observation
- Weather conditions
- Air temperature
- Sea state
- Cloud cover
- Visibility
- Glare
- Tide
- Ice coverage (if applicable)

MMOs will record the time that observations begin and end as well as the durations of shutdowns. MMOs will document the reason for stopping work, time of shutdown, and type of pile installation or other in-water work taking place.

MMOs will document other, non-project-related activities that could disturb marine mammals in the area, such as the presence of large and small vessels. Additionally, all communications between MMOs and the construction crew will be documented.

Data concerning environmental conditions, marine mammal sightings, and mitigation measures will be entered into a spreadsheet. Each data entry will be checked for quality assurance and quality control. This data will, upon request, be submitted to NMFS along with the final monitoring report.

4.2 Sightings

Each marine mammal observation will be documented on a Marine Mammal Sighting Form consisting of a data page/table and a schematic map of the location of the observed animal (Appendix B).

The following information will be recorded (summarized in Appendix B):

1. Dates and times (begin and end) of all marine mammal monitoring
2. Construction activities occurring during each daily observation period, including how many and what type of piles were driven or removed and by what method (i.e. impact, vibratory, or drilling).
3. Weather parameters and water condition during each monitoring period (e.g. wind speed, percent cover, visibility, sea state).

4. The number of marine mammals observed, by species, relative to the pile location and if pile driving or removal was occurring at the time of the sighting.
5. Age and sex, if possible, of all marine mammals observed.
6. MMOs locations during marine mammal monitoring.
7. Distances and bearings of each marine mammal observed to the pile being driven or removed for each sighting (if pile driving or removal was occurring at the time of sighting).
8. Description of any marine mammal behavior patterns during observation, including direction of the travel.
9. Number of individuals of each species detected within the monitoring zone, and estimates of number of marine mammals taken, by species.
10. Detailed information about any implementation of any mitigation triggered (e.g. shutdowns or delays), a description of specific actions that ensued, and resulting change of behavior of the animals, if any.
11. Description of attempts to distinguish between the number of individual animals taken and the number of incidents of take, such as ability to track groups or individuals.
12. Takes by Level B harassment must be recorded by MMOs and extrapolated based upon the number of observed takes and the percentage of the Level B harassment zone that was not visible.

Additionally, MMOs will record whether no take occurred, or a Level A and/or Level B take occurred, including the number of marine mammals, species taken and recorded as it occurs.

Appendix B: Example Data Forms includes the daily reporting forms each MMO will record this information.

4.3 Equipment

The following equipment and information will be required on site for marine mammal monitoring:

- Portable radios for the MMOs to communicate with the Construction Contractor point of contact and other MMOs; or cellular phones and phone numbers for all MMOs and the Construction Contractor point of contact
- Daily tide tables
- Hand-held binoculars (7X or better) with built-in rangefinder or reticles
- Rangefinder
- Paper data forms or electronic data collection system (e.g., Toughbook or iPad) and back-up paper forms
- Large (11- by 17-inch or similar) waterproof maps of the Project area and monitoring Zones

4.4 Quality Assurance and Quality Control

Electronic data collection or paper data sheets will be QA/QC'd by the Lead MMO at the end of each monitoring day. No cells or information will be left blank. If information is not available or not applicable, the field will be populated with an "NA" or dash. The data will also be QA/QC'd once it is entered electronically.

4.5 Marine Mammal Monitoring Data Management

All marine mammal monitoring data will be entered into and stored in an electronic database or spreadsheet. The database or spreadsheet will be set up and structured for easy access and management of data and will be used to develop the marine mammal monitoring report. An electronic copy of the data spreadsheet will be available to NMFS upon request.

5 REPORTING

5.1 Notification of Intent to Commence Construction

Dawson will inform the NMFS Office of Protected Resources and the NMFS Alaska Region Protected Resources Division one week prior to commencing pile installation and removal (Julie Scheurer, 907-586-7111, Julie.Scheurer@noaa.gov).

5.2 Reporting

During construction, MMOs will maintain daily activity logs that include the following information:

1. Time that each monitoring period begins and ends
2. Prevailing environmental conditions
3. In-water construction activities occurring during each monitoring period (including number, type, and size of piles)
4. Indication of whether marine mammals were sighted

During construction, Dawson will submit brief monthly reports, which summarize MMO observations and recorded takes, to the Engineer. These reports will be submitted by DOT & PF Environmental Analyst to NMFS Alaska Region Protected Resources Division. The reporting period for each monthly MMO report will be the entire calendar month, and reports will be submitted by close of business on the tenth day of the month following the end of the reporting period (e.g., the monthly report covering September 1–30, 2020, would be submitted to NMFS by close of business on October 10, 2020). The monthly reports will be submitted by DOT&PF via email to Julie.Scheurer@noaa.gov.

To the extent practicable, the MMOs will record behavioral observations summarized in Appendix B.

5.3 Notification of Injured or Dead Marine Mammals

In the unanticipated event that the specified activity (pile installation and removal) clearly causes the take of a marine mammal for which authorization has not been granted, such as a serious injury or mortality, DOT&PF will immediately cease pile installation and removal and report the incident to the following offices:

- NMFS Office of Protected Resources (301-427-8401)
- NMFS Alaska Region Protected Resources Division (907-271-5006)
- NMFS Alaska Regional Stranding Coordinator (907-271-3448) or hotline (877-925-7773).

The report will include the following information:

- Time, date, and location (latitude/longitude) of the incident
- Detailed description of the incident
- Description of vessel involved (if applicable), including the name, type of vessel, and vessel speed before and during the incident
- Status of all sound source use in the 24 hours preceding the incident
- Environmental conditions (wind speed and direction, wave height, cloud cover, and visibility)
- Description of marine mammal observations in the 24 hours preceding the incident
- Species identification, description, condition, and fate of animal(s) involved
- Photographs or video footage of animals or equipment (if available)

Pile installation and removal shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with DOT&PF to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. Dawson will not resume pile installation and removal until notified by DOT&PF.

If DOT&PF discovers an injured or dead marine mammal and the Lead MMO determines that the cause of the injury or death is unrelated to the Project, DOT&PF will immediately report the incident to:

- Alaska Regional Stranding hotline (877-925-7773)

The report will include any applicable information listed above. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with DOT&PF to determine whether modifications to the activities are appropriate.

6 Appendix A: Marine Mammal Monitor Locations

6.1 Phase 1 - Revilla: Single Hammer - Vibratory

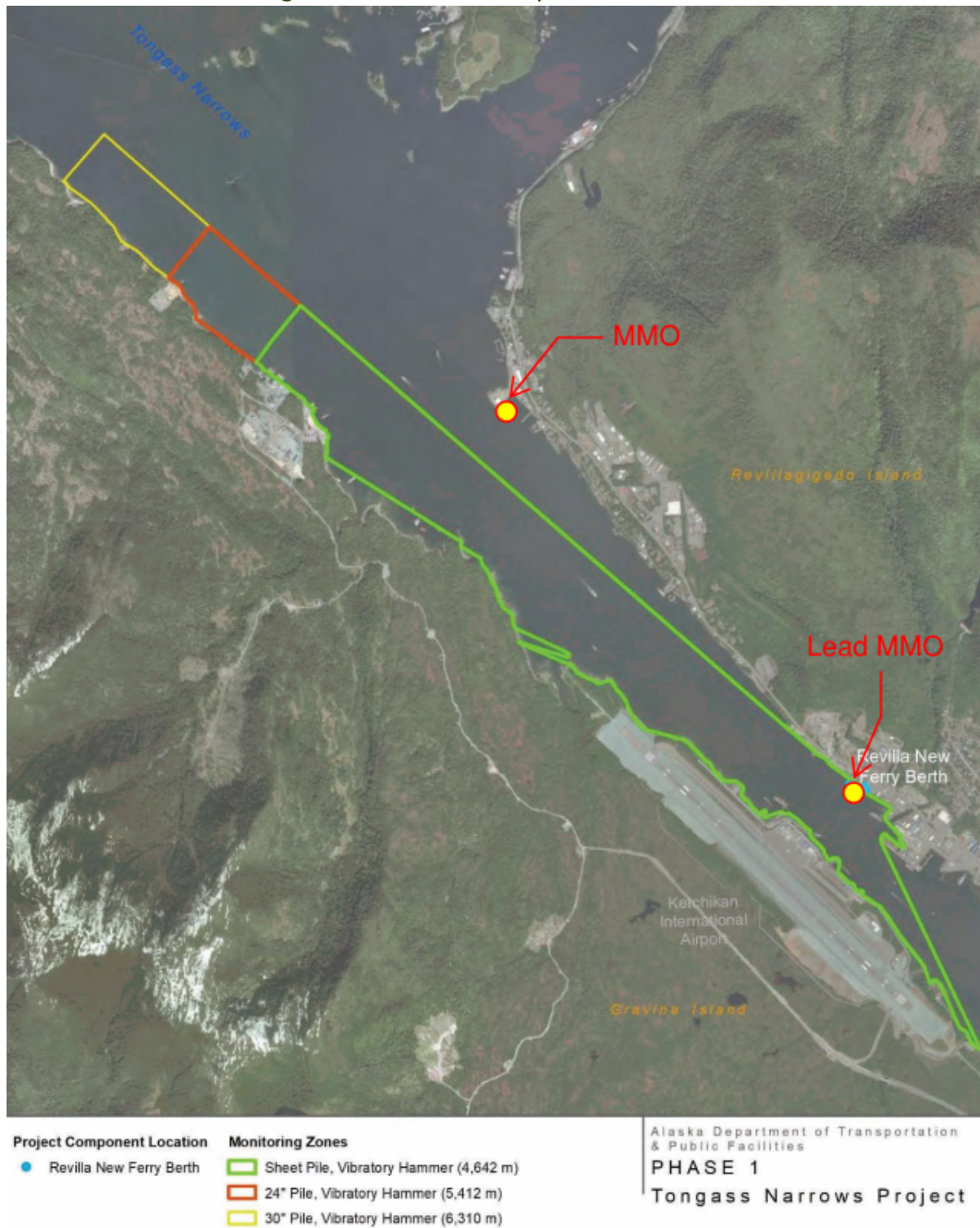


Figure 5.1: Marine Mammal Monitor locations during Revilla vibratory hammer work. One MMO on the rig; one MMO at the Peninsula Point (eastern edge of the TEMSCO float plane hangar).

6.2 Phase 1 - Revilla: Single Hammer - Impact

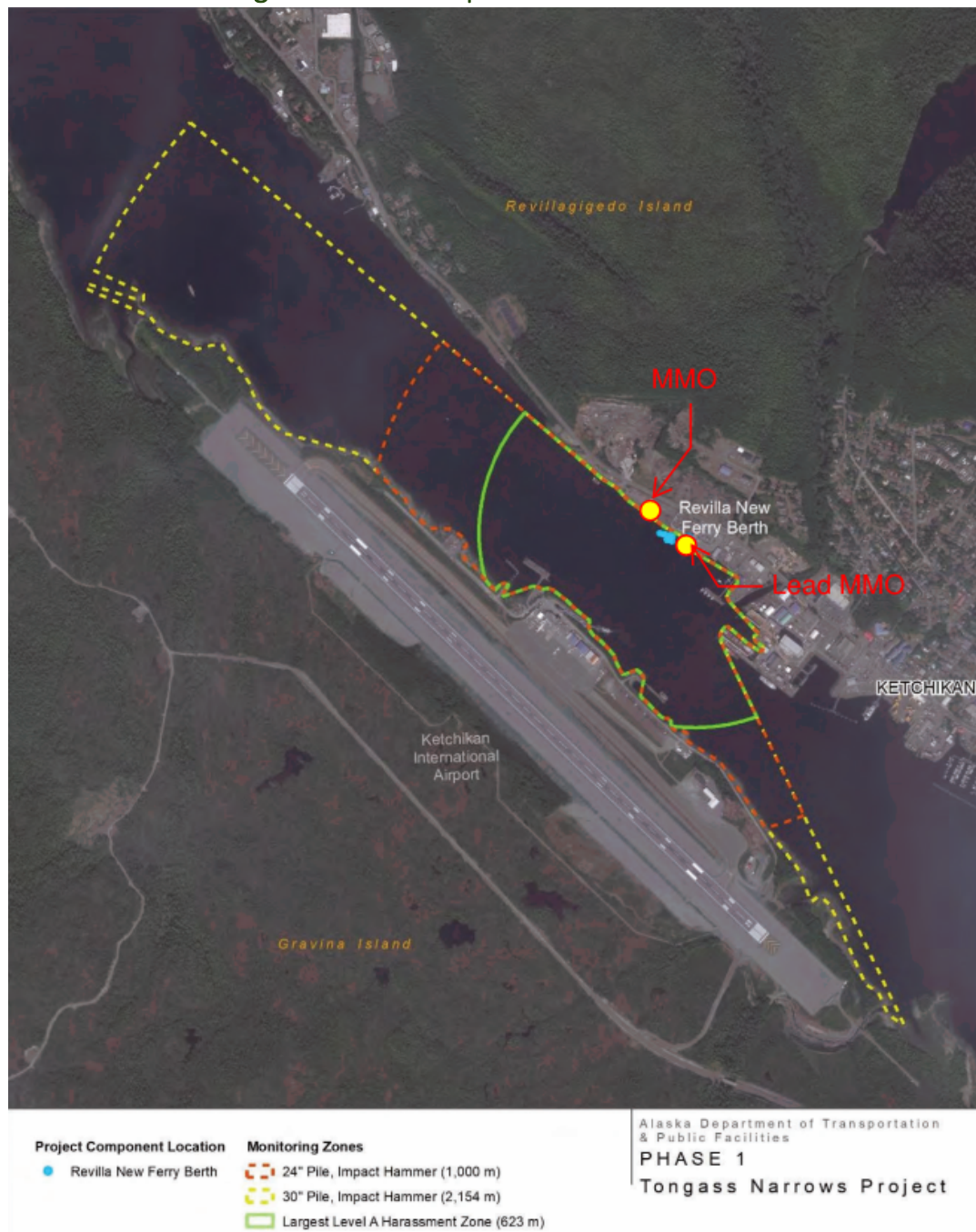


Figure 5.2: Marine Mammal Monitor locations during Revilla impact hammer work. One MMO on the rig; one MMO on the north end of the jobsite.

6.3 Phase 1 - Revilla: Single Hammer + Drill

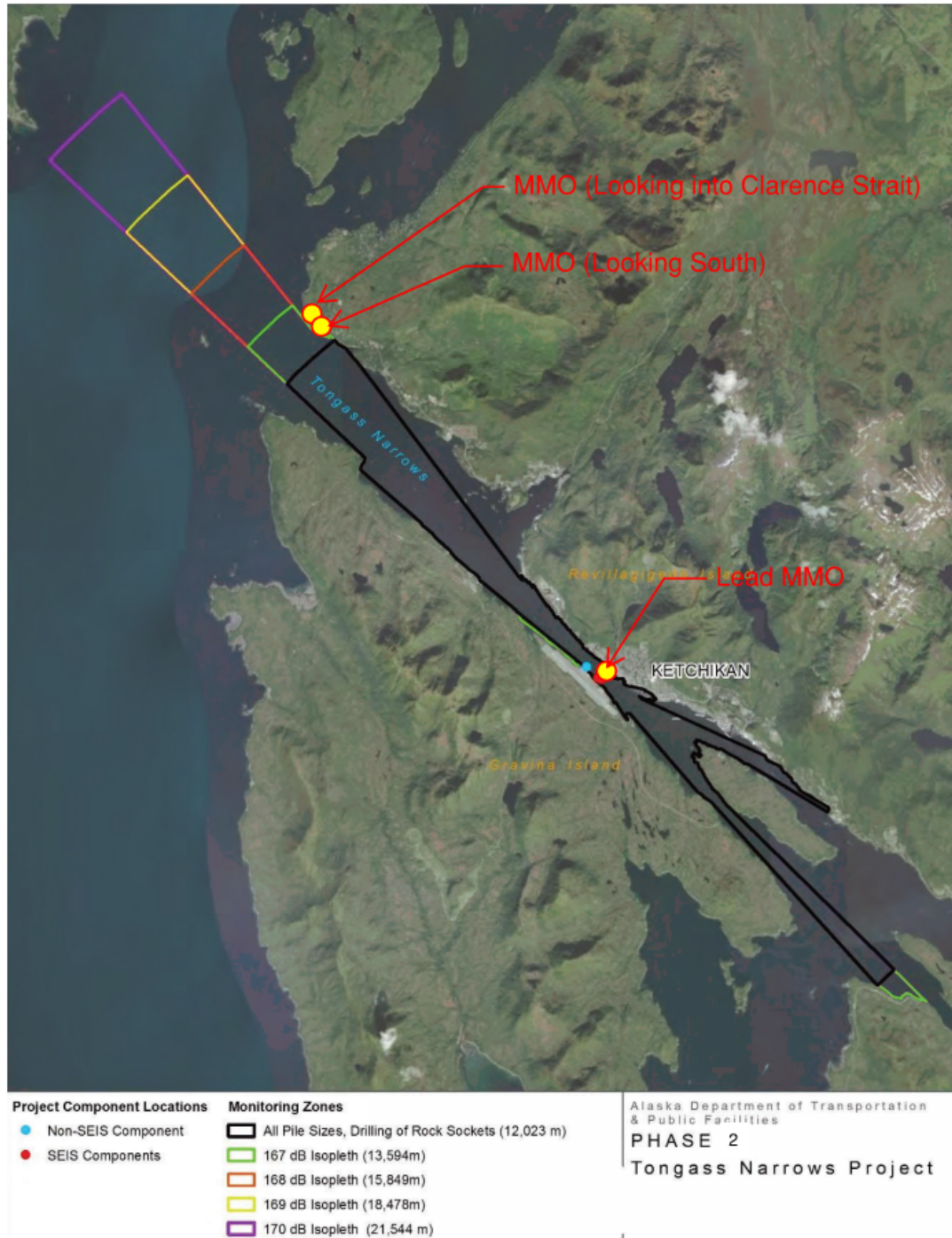


Figure 5.3: Marine Mammal Monitor locations during Revilla simultaneous drilling/hammer work. One MMO on the rig; two MMOs at South Point Higgins, one looking south into Tongass Narrows and the other into Clarence Strait.

6.4 Phase 1 - Revilla + Gravina: Single Hammer (Gravina) + Single Drill (Revilla)



Figure 5.4: Marine Mammal Monitor locations during Revilla + Gravina simultaneous drilling/hammer work. One MMO on each rig; two MMOs at South Point Higgins, one looking into Tongass Narrows and the other Clarence Strait.

6.5 Phase 2 - Gravina: Single Hammer - Vibratory

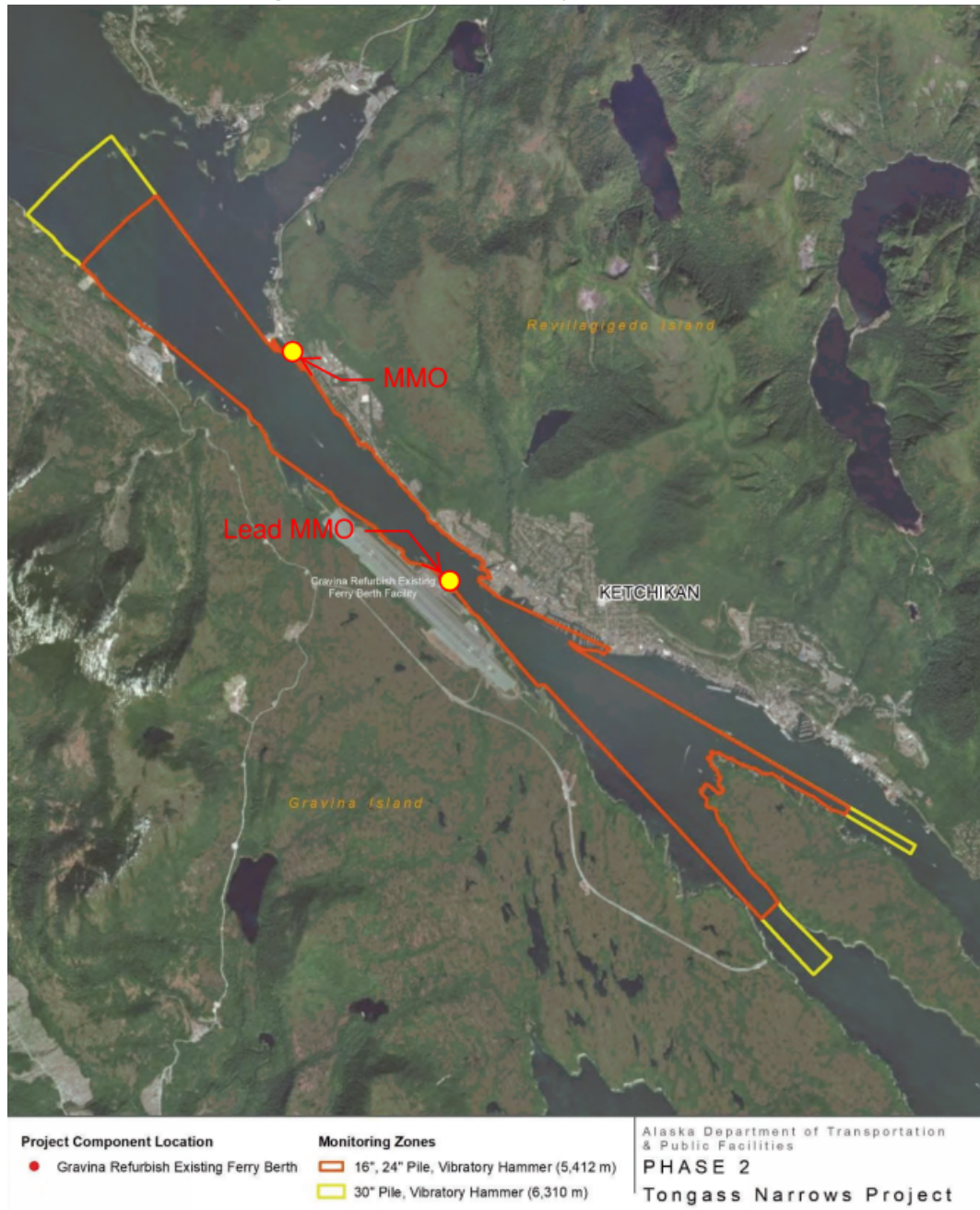


Figure 5.5: Marine Mammal Monitor locations during Gravina vibratory work. One MMO on the rig; one MMO at the Peninsula Point (eastern edge of the TEMSCO float plane hangar).

6.6 Phase 2 - Gravina: Single Hammer – Impact



Figure 5.6: Marine Mammal Monitor locations during Gravina impact work. One MMO on the rig; one MMO at north end of the project site (Revilla side).

6.7 Phase 2 - Gravina: Single Hammer + Drill

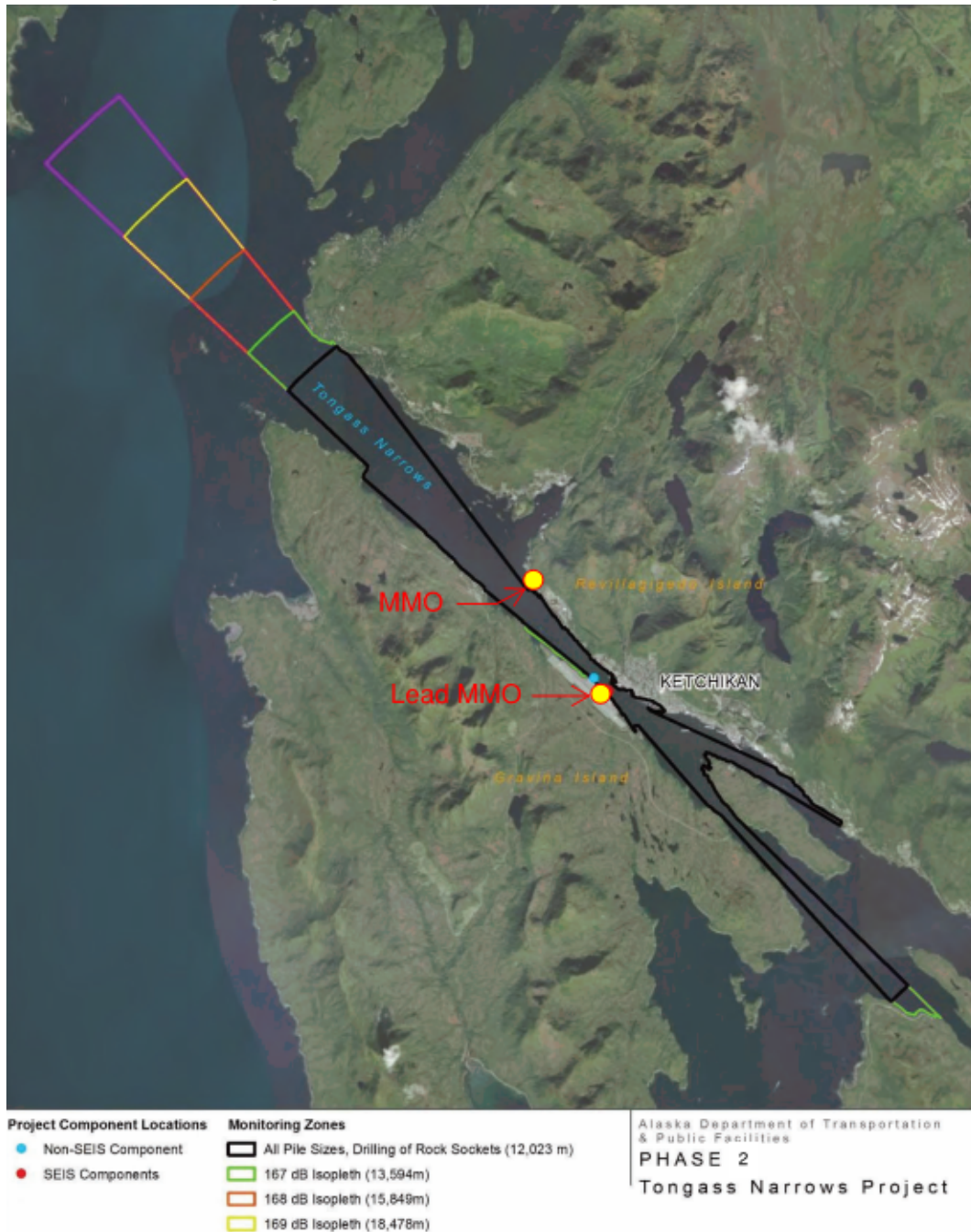


Figure 5.7: Marine Mammal Monitor locations during Gravina drilling work. One MMO on the rig; one MMO at the Peninsula Point (eastern edge of the TEMSCO float plane hangar).

7 Appendix B: Example Data Forms

Marine Mammal Sighting Form

Project:		Location:		Sighting #:	
Date:		Observer(s):		<i>(1st sighting of the day is Sighting#: 1)</i>	

Time (military)		Species (circle)	Distance (animal to activity)		Number of Animals		Number of Animals in Each Class (if possible)			
Initial Sighting Time		Steller Sea Lion	Initial Distance		Min Count		Adults		Calves/ Pups	
Final Sighting Time		Harbor Seal								
Time Entered H-Zone B		Harbor Porpoise	Closest Distance		Max Count		Juveniles		Unkn. Age	
Time Exited H-Zone B		Dall's Porpoise								
Time Entered H-Zone A		Killer Whale	Final Distance		Best Count		Male		Female	
Time Exited H-Zone A		Humpback								
		Fin Whale					Unknown Sex			
		Gray Whale								
		Minke Whale								
		other: _____								

Behavior of Marine Mammal check all observed behaviors; place a 1 next to primary, 2 next to secondary activity):
Indicate any changes in behavior in the Additional Information section

<input type="checkbox"/> Travel	<input type="checkbox"/> Fight	<input type="checkbox"/> Mill	Other: _____
<input type="checkbox"/> Disoriented	<input type="checkbox"/> Play	<input type="checkbox"/> Dive	
<input type="checkbox"/> Slap	<input type="checkbox"/> Spyhop	<input type="checkbox"/> Unknown	
<input type="checkbox"/> Feeding Observed	<input type="checkbox"/> Swimming Toward	<input type="checkbox"/> Swimming Away from Site	

Group Cohesion (Orientation of animals within the group and the approx. distance between animals) :

Project Activities and Harassment Zone

Entered Harassment Zone A? **Y or N** Entered Harassment Zone B? **Y or N**

In-Water Work was occurring at initial sighting? **Y or N** List In-water Activities: _____

SHUT DOWN or DELAYED from _____ to _____ (time)

NO SHUT DOWN, EXPLANATION REQUIRED:

Describe Commerical Activities (# and type of vessels offloading at sea food processing dock, traveling by, refueling at dock):

Additional Information (include more detailed information on behavior) :

Draw locations on hardcopy map

Page ____ of ____

[illegible]

Data Attribute	Attribute Definition and Units Collected
Start and End time of monitoring period	Time that monitoring by MMOs/PSOs began and ended, without interruption.
Environmental Conditions	
Weather conditions	Dominant weather conditions, collected every 30 minutes: sunny (S), partly cloudy (PC), light rain (LR), steady rain (R), fog (F), overcast (OC), light snow (LS), snow (SN)
Wind speed	In knots

Data Attribute	Attribute Definition and Units Collected
Wind direction	From the north (N), northeast (NE), east (E), southeast (SE), south (S), southwest (SW), west (W), northwest (NW)
Wave height	Calm, ripples (up to 4 inches), small wavelets (up to 8 inches), large wavelets (up to 2 feet), small waves (up to 3 feet), moderate waves (up to 6 feet), large waves (up to 9 feet)
Cloud cover	Amount of cloud cover (0–100%)
Visibility	Maximum distance at which a marine mammal could be sighted
Glare	Amount of water obstructed by glare (0–100%) and direction of glare (from south, north, or another direction)
Tide	Predicted hourly data information gathered from National Oceanic and Atmospheric Administration will be available on site
Construction and Communication Activities	
Time of event	Time that construction activities and all communications between MMOs/PSOs and construction crews take place
Type of construction activity	Type of construction activity occurring, including ramp up, startup, shutdown, and type of pile installation technique
Communication	Information communicated between MMOs/PSOs and construction crew
Marine Mammal Sighting Data	
Time of initial and last sightings	Time the animals are initially and last sighted
Species	Species (use unidentified cetacean or pinniped if unknown); sex and age class, if possible
Number of individuals	Minimum and maximum number of animals counted; record the count the MMO believes to be the most accurate
Sex and age, if possible	Generally, numbers of females with pups or calves
Initial and final heading	Direction animals are headed when initially and last sighted
In-water construction activities at time of sighting	Types of construction activities occurring at time of sighting and any mitigation measures implemented
Distance from marine mammal to construction activities	Distance from marine mammal to construction activities when initially sighted, closest approach to activities, and at final sighting (include location relative to monitoring and shutdown zones)
Commercial activities at time of sighting	Description of nearby commercial or anthropogenic activities occurring at time of sighting not associated with the Project
Behavior	Behaviors observed, indicating the primary and secondary behaviors
Change in behavior	Changes in behavior; indicate and describe
Group cohesion	Orientation of animals within the group and the distance between animals

8 Appendix C: Simultaneous Sound Level Worksheets

Table 1. Combined Sound Levels Generated during Pile Installation and Removal for Combinations of Two Pieces of Equipment: Impact Hammer, Vibratory Hammer, and Down-hole Drill

Phase 1	Method		Vibratory					Drilling		Impact		
	Pile Diameter	SSL	Sheet	18	20	24	30	24	30	18/20	24	30
			160	161	161	161	162	166	166	190	190	195
			163	164	164	164	164	167	167	No Addition (Level B = Vibratory, Level A = Impact)		
Vibratory	18	161	164	NA		164	165	167	167			
	20	161	164			164	165	167	167			
	24	161	164	164	164	164	165	167	167			
	30	162	164	165	165	165	165	167	167			
	Drilling	24	166	167	167	167	167	169	169			
Impact	18/20	190	No Addition (Level B = Vibratory, Level A = Impact)								No Addition	
	24	190										
	30	195										

Notes:

Use this sheet if two piles are installed/removed simultaneously.

NA = Combinations of equipment not possible given construction plans for each component.

The following tables are not expected to be needed, based on the construction schedules for the Island Shuttle Ferry Berths at Revilla, Gravina or the Gravina Airport Layup and Freight Facility.

Table 2. Combined Sound Levels Generated during Pile Installation and Removal for Combinations of Three Pieces of Equipment: Impact Hammer, Vibratory Hammer, and Down-hole Drill, when the Pile Installed at Revilla is 24 inches in Diameter

Phase 1 New Gravina Island Shuttle Ferry Berth												
Gravina Airport Layup and Freight	Method		Vibratory					Drilling		Impact		
	Pile Diameter	SSL	Sheet	18	20	24	30	24	30	18/20	24	30
			160	161	161	161	162	166	166	190	190	195
			166	NA		166	166	168	168	No Addition (Level B = Vibratory, Level A = Impact)		
Vibratory	18	161	166			166	166	168	168			
	20	161	166	NA		166	166	168	168			
	24	161	166	166	166	166	166	168	168			
	30	162	166	166	166	166	167	169	169			
Drilling	24	166	168	168	168	169	168	170	170			
	30	166	168	168	168	169	168	170	170			
Impact	18/20	190	No Addition (Level B = Vibratory, Level A = Impact)								No Addition	
	24	190										
	30	195										

Notes:

24-inch SSL = 161

Use this table when three piles are installed simultaneously, and the pile installed at Revilla is 24-in diameter.

NA = Combinations of equipment not possible given construction plans for each component.

Table 3. Combined Sound Levels Generated during Pile Installation and Removal for Combinations of Three Pieces of Equipment: Impact Hammer, Vibratory Hammer, and Down-hole Drill, when the Pile Installed at Revilla is 30 Inches in Diameter

Gravina Airport Layout and Freight	Method		Vibratory						Drilling		Impact		
			Pile Diameter			Sheet	18	20	24	30	24	30	18/20
		SSL	160	161	161	161	162	166	166	190	190	195	
	Vibratory	18	161	166	NA		166	167	169	169	No Addition (Level B = Vibratory, Level A = Impact)		
		20	161	166			166	167	169	169			
		24	161	166	166	166	166	167	169	169			
		30	162	166	167	167	167	167	169	169			
	Drilling	24	166	169	169	169	169	168	170	170			
		30	166	169	169	169	169	168	170	170			
	Impact	18/20	190	No Addition (Level B = Vibratory, Level A = Impact)							No Addition		
24		190											
30		195											

Notes:

30-inch SSL = 162

Use this table when three piles are installed simultaneously, and the pile installed at Revilla is 30-in diameter.

NA = Combinations of equipment not possible given construction plans for each component.

Table 4. Combined Sound Levels Generated during Pile Installation and Removal for Combinations of Three Pieces of Equipment: Impact Hammer, Vibratory Hammer, and Down-hole Drill, when the Pile Installed at Revilla is Sheet Pile

Phase 1 Gravina Airport Layout and Freight	New Gravina Island Shuttle Ferry Berth													
	Method			Vibratory						Drilling		Impact		
				Pile Diameter		Sheet	18	20	24	30	24	30	18/20	24
		SSL	160	161	161	161	162	166	166	190	190	195		
	Vibratory	18	161	166	NA		166	166	168	168	No Addition (Level B = Vibratory, Level A = Impact)			
		20	161	166			166	166	168	168				
		24	161	166	166	166	166	168	168					
		30	162	166	166	166	166	168	168					
	Drilling	24	166	168	168	168	168	168	170	170				
		30	166	168	168	168	168	168	170	170				
Impact	18/20	190	No Addition (Level B = Vibratory, Level A = Impact)							No Addition				
	24	190												
	30	195												

Notes:

Sheet pile SSL = 160

Use this table when three piles are installed simultaneously, and sheet piles are installed at Revilla.

NA = Combinations of equipment not possible given construction plans for each component.

Attachment B: Marine Mammal Sighting Data

Date	Start Time	End Time	Total Time	Construction Type	Pile Size	Pile Type	# of Piles	Visibility	Glare	Weather	BSS	Wind/Swell Direction	Monitoring Location	PSO Initials	Construction at Time of Sighting	Species	Time Sighted	Time Left	Group Size	Behavior	Distance from Work	Take?	Resighting?	Mitigation	Notes	
10/28/2020	930	1727	7:57	Vibratory Hammer/ Impact Hammer	20-inch	Temporary	2	5,000m	5	OC	1	2kn (SE)	Project Site	DR	NO SIGHTINGS											
10/28/2020	930	1727	7:57	Vibratory Hammer/ Impact Hammer	20-inch	Temporary	2	5,000m	5	OC	1	2kn (SE)	Peninsula	AR	NONE	HPBK	1111	1130	1	TR(SE)/SW/DI	1,500m	N		Delay	Waited for it to leave Level B zone; last sighted then waited required 30 minutes	
10/29/2020	730	1056	3:26	Vibratory Hammer/ Impact Hammer	20-inch	Temporary	3	5,000m	0	OC	1	3kn (NE)	Project Site	DR	NO SIGHTINGS											
10/29/2020	730	1056	3:26	Vibratory Hammer/ Impact Hammer	20-inch	Temporary	3	5,000m	0	OC	1	NA	Peninsula	AR	NONE	STSL	856	900	1	TR(NW)/DI	1,500m	N		NONE	Did not enter A or B Zone	
10/30/2020	1022	1532	5:10	Vibratory Hammer (Remove 1)/ Impact Hammer (2)	20-inch	Temporary	3	5,000m	10	PC	1	1kn (SE)	Project Site	DR	NO SIGHTINGS											
10/30/2020	1022	1532	5:10	Vibratory Hammer (Remove 1)/ Impact Hammer (2)	20-inch	Temporary	3	5,000m	10	PC	1	2kn (SE)	Peninsula	AR	NO SIGHTINGS											
11/2/2020	1225	1557	3:32	Vibratory Hammer/ Impact Hammer	20-inch	Temporary	1	5,000m	5	OC	2	10kn (SE)	Project Site	DR	NONE	HPBK	1227	1300	1	TR (NW)/DI/SW	1,101m-1,200m	N	N	NONE	Left zone before work began	
11/2/2020	1225	1557	3:32	Vibratory Hammer/ Impact Hammer	20-inch	Temporary	1	5,000m	10	OC	1	5kn (SE)	Project Site	DR	Vibratory Hammer (inch)	(20-	HSEA	1422	1422	1	TR (SE)/SW	201m-300m	Y	N	NONE	No shutdown, harbor seal appeared in B zone during vibratory installation. Automatic B Take calculated
11/2/2020	1225	1557	3:32	Vibratory Hammer/ Impact Hammer	20-inch	Temporary	1	4,500m	5	LR	2	7kn (NW)	Project Site	DR	Impact Hammer (inch)	(20-	HPBK	1457	1523	1	FO/DI/SW (SE)	501m-600m	Y	N	SD	Contractor was prepared to start impact work at about 3:00pm. Waited for 20 minutes for humpback to move away from A zone, then decided to move forward with a level B take.
11/2/2020	1225	1557	3:32	Vibratory Hammer/ Impact Hammer	20-inch	Temporary	1						Peninsula	AR	NONE	HPBK	1300	1340	1	TR (N)/SW	1,500m	N	N	NONE	The humpback was observed leaving the B zone to the north before the in water work began.	
11/2/2020	1225	1557	3:32	Vibratory Hammer/ Impact Hammer	20-inch	Temporary	1						Peninsula	AR	NONE	STSL	1408	1415	2	SW (N)	1,500m	N		NONE	The 2 sea lions never entered the A or B harassment zones	
11/3/2020	930	1322	3:52	Vibratory Hammer/ Impact Hammer	20-inch	Temporary	2	5,000m	0	OC	1	5kn (NW)	Project Site	DR	NO SIGHTINGS											
11/3/2020	930	1322	3:52	Vibratory Hammer/ Impact Hammer	20-inch	Temporary	2	5,000m	0	OC	2	5kn (NW)	Peninsula	AR	NONE	HSEA	946	956	1	TR (N)/SW	1,500m	N		NONE	Never entered either zone and continued to head north away from all zones. Also occurred before work started during initial observation.	
11/4/2020	730	1045	3:15	Impact Hammer	12-inch	Temporary	2	5,000m	0	OC	1	5kn (N)	Project Site	DR	NONE	HPBK	1037	1044	1	TR (SE)/FO/DI	250-2,000m	N	Y	NONE	Same HPBK. Communicated with Northern observer and picked up sighting of same humpback as it was traveling South towards the work barge. Observed it first from about 2000m, and then eventually it came up feeding at about 250m north of the barge, then dove. Never entered zone.	
11/4/2020	730	1045	3:15	Impact Hammer	12-inch	Temporary	2	5,000m	5	OC	1	1kn (E)	Peninsula	AR	Impact Hammer (inch)	(18-	HPBK	1015	1031	1	SW (SE)/FO/BR	1,500m	N	N	NONE	Observed the humpback outside of both the A and B zones just as the in water work was shutting down. Watched it moving South for 15 minutes and then could no longer see it. Next observation was same whale picked up and continued by observer on barge. Never entered zone.
11/5/2020	1230	1500	2:30	Vibratory Hammer/ Impact Hammer	12-inch	Temporary	2	5,000m	0	LR	3	6.5kn (NW)	Project Site	DR	Impact Hammer (inch)	(18-	HPBK	1327	1352	1	FO/TR (SE)/DI	1,401m-1,500m	Y	Y	NONE	Same HPBK. B take occurred at 1:33pm when the humpback entered the B zone north of the work site. Impact driving was suspended from 1:35 to 1:52, because the workers were now preparing a new piling to be set into place. During that natural in water work shutdown, the humpback swam Southeast past the worksite and was spotted 400m south of worksite at 1:48pm, before driving began again. Driving began at 1:52 pm and the whale was also seen at 1:52pm feeding off the shipyard dock about 500m south of the worksite, and then it continued South out of view.
11/5/2020	1230	1500	2:30	Vibratory Hammer/ Impact Hammer	12-inch	Temporary	2	5,000m	0	OC	3	5kn (NW)	Peninsula	AR	Impact Hammer (inch)	(18-	HPBK	1247	1326	1	FO/SW (SE)/	1,500m	N	N	NONE	Headed southeast. Lost sight at 1:26, lead observer picked up observations. First sighting 300m West of observer, 3400 m from work site at 12:47. Observed feeding and diving, while traveling south toward work site. Last sighting at 1:26pm about 1500m North of work site, feeding. Observations then continued by lead observer.
11/12/2020	745	1035	2:50	NONE				5,000m	0	OC	1	5kn (SE)	Project Site	DR	NONE	HPBK	1003	1026	1	FO/TR (SE)/DI	0m-100m	N	Y	NONE	Same humpback that northern observer was watching travel south. Was feeding in area near work site and eventually travelled south out of view	
11/12/2020	745	1035	2:50	NONE				5,000m	0	OC	3	5kn (S)	Peninsula	AR	NONE	HPBK	936	944	1	FO/TR (S)/DI	1,500m	N	N	NONE	Picked up by project site PSO.	
11/12/2020	725	1328	6:03	Vibratory Hammer	30-inch	Sheets	6	Good-Excellent	0-10%	PC	1	(S)	Project Site	DR	NONE	STSL	801	804	1	TR (N)/DI	1,000m	N		NONE	Traveled north and then dove.	
11/13/2020	725	1328	6:03	Vibratory Hammer	30-inch	Sheets	6	Good-Excellent	0-10%	PC	1	(S)	Project Site	DR	NONE	HPBK	1004	1009	1	FO/TR(S)	150m-350m	N	Y	NONE	Same whale sighted by Peninsula PSO (sighting 4-4.2); also seen by Safeway PSO	
11/13/2020	725	1328	6:03	Vibratory Hammer	30-inch	Sheets	6	Excellent	5-30%	PC/OC	1	(S)	Peninsula	AR	NONE	HSEA	738		1	MJ/SI	3,400m	N		NONE	Floating around just south of Peninsula Point	
11/13/2020	725	1328	6:03	Vibratory Hammer	30-inch	Sheets	6	Excellent	5-30%	PC/OC	1	(S)	Peninsula	AR	NONE	STSL	834	840	2	TR/SW (N)	3,400m	N		NONE		
11/13/2020	725	1328	6:03	Vibratory Hammer	30-inch	Sheets	6	Excellent	5-30%	PC/OC	1	(S)	Peninsula	AR	NONE	DAPO	846	904	6	MJ/SW	4,200m-5,600m	N		NONE	Never entered zone; milling south of channel island and then moved into mid-channel	
11/13/2020	725	1328	6:03	Vibratory Hammer	30-inch	Sheets	6	Excellent	5-30%	PC/OC	1	(S)	Peninsula	AR	Vibratory Hammer	HPBK	932	950	1	TR (S)/CH	1,700m-3,400m	N	N	NONE	Whale surfaced just north of peninsula point then dove. Surfaced again near red can #10. Next surfaced next to breakwater with a lot of birds in the area. Sighted by Project Site PSO	
11/13/2020	725	1328	6:03	Vibratory Hammer	30-inch	Sheets	6	Excellent	5-30%	PC/OC	1	(S)	Peninsula	AR	Vibratory Hammer	ORCA	1132	1152	3	SW (S)	4,500m-5,600m	N		NONE	1 male and 2 females swimming at surface about mid-channel 500 meters from the Peninsula Point PSO. Turned around and swam north back up Tongass Narrows.	
11/13/2020	725	1328	6:03	Vibratory Hammer	30-inch	Sheets	6	Good	0-10%	PC/OC	0-2	(S)	Safeway	RK	NONE	STSL	747	754	1	SW (N)	1,800m	N		NONE		
11/13/2020	725	1328	6:03	Vibratory Hammer	30-inch	Sheets	6	Good	0-10%	PC/OC	0-2	(S)	Safeway	RK	Vibratory Hammer	HSEA	1029	1031	1	SP/L/O	2,000m	N		NONE	Popped head up	
11/13/2020	725	1328	6:03	Vibratory Hammer	30-inch	Sheets	6	Good	0-10%	PC/OC	0-2	(S)	Safeway	RK	Vibratory Hammer	HPBK	1042	1323	1	TR (S)	1,750m-2,500m	N	Y	NONE	Same whale as other PSOs. Out of zone. Surfaced close to Tongass Trading Dock heading south.	
11/16/2020	945	1510	5:25	Vibratory Hammer	27.6-inch	Sheets	7	Good-Excellent	0-5%	PC/OC	1	(S)	Project Site	DR	NONE	HPBK	1020	1045	1	TR(S)/M/CH/DI	75m-750m	N	Y	NONE	Same HPBK as Peninsula sighting #1. Feeding immediately north and south of the site. Diving and surfacing close to the Level B zone border-inside and outside.	
11/16/2020	945	1510	5:25	Vibratory Hammer	27.6-inch	Sheets	7	Good-Excellent	0-5%	PC/OC	1	(S)	Project Site	DR	Vibratory Hammer	HPBK	1320	1347	1	TR(N)/FO/CH/LWA	50m-600m	Y	Y	Delay	Same HPBK whale as Safeway sighting #3. Spouted and dove just on border of B zone-decided to delay start of work. Feeding near work site and slowly moving north, but feeding and milling near work. Decided to start work and use a Level B Take at 1342-no change in feeding behavior after work started.	
11/16/2020	945	1510	5:25	Vibratory Hammer	27.6-inch	Sheets	7	Excellent	0-10%	PC/R/SN	2	S/NE	Peninsula	AR	NONE	HPBK	946	1011	1	FO/SW(S)/AWA/DI	2,000m-3,400m	N	N	NONE	Lunge feeding with bubble ring two times around point-Not in B Zone. Heading south near red buoy #10-Not in B zone. Feeding around edge/breakwater with lots of bird activity-Not in B zone.	
11/16/2020	945	1510	5:25	Vibratory Hammer	27.6-inch	Sheets	7	Excellent	0-10%	PC/R/SN	2	S/NE	Peninsula	AR	NONE	STSL	1030	1032	1	SW/TR(N)	3,400m	N		NONE	Swimming north right off the point-Not in B zone.	
11/16/2020	945	1510	5:25	Vibratory Hammer	27.6-inch	Sheets	7	Excellent	0-10%	PC/R/SN	2	S/NE	Peninsula	AR	Vibratory Hammer	HPBK	1400	1414	1	FO/M/DI	1,700m-3,400m	N	Y	NONE	Same HPBK as Project Sighting #2. Lunge feeding and milling near breakwater with a lot of bird activity-not in B zone.	
11/16/2020	945	1510	5:25	Vibratory Hammer	27.6-inch	Sheets	7	Excellent	0-10%	PC/R/SN	2	S/NE	Peninsula	AR	NONE	STSL	1451	1454	1	SW(S)	3,400m	N		NONE	Swimming just off of the Point-not in B zone.	
11/16/2020	945	1510	5:25	Vibratory Hammer	27.6-inch	Sheets	7	Good	10-20%	PC/L	1	N/W	Safeway	RK	NONE	STSL	1050		1	SW(S)	2,000m	N		NONE	Not in B Zone	
11/16/2020	945	1510	5:25	Vibratory Hammer	27.6-inch	Sheets	7	Good	10-20%	PC/L	1	N/W	Safeway	RK	NONE	HPBK	1108	1117	1	TR(S)	2,000m	N	Y	NONE	Same HPBK as Peninsula and Project sighting #1. Traveling south 200m from PSO-not in B zone.	
11/16/2020	945	1510	5:25	Vibratory Hammer	27.6-inch	Sheets	7	Good	10-20%	PC/L	1	N/W	Safeway	RK	Vibratory Hammer	HPBK	1237	1253	1	TR(N)/FO	2,500m	N	N	NONE	Traveling north slowly feeding-out of zone B.	
11/16/2020	945	1510	5:25	Vibratory Hammer	27.6-inch	Sheets	7	Good	10-20%	PC/L	1	N/W	Safeway	RK	Vibratory Hammer	HSEA	1408	1409	1	LO	2,200m	N		NONE	Popped head up next to shore-out of zone B.	
11/17/2020	1025	1625	6:00	Vibratory Hammer	27.6-inch	Sheets	9	Good	0%	OC	2-4	N	Project Site	DR	NONE	HPBK	1045	1048	1	CH/TR(S)/DI	350m-450m	N	N	NONE	Spouted and dove in southerly direction. Exited the B zone; multiple spouts.	

Date	Start Time	End Time	Total Time	Construction Type	Pile Size	Pile Type	# of Piles	Visibility	Glare	Weather	BSS	Wind/Swell Direction	Monitoring Location	PSO Initials	Construction at Time of Sighting	Species	Time Sighted	Time Left	Group Size	Behavior	Distance from Work	Take?	Resighting?	Mitigation	Notes
11/17/2020	1025	1625	6:00	Vibratory Hammer	27.6-inch	Sheets	9	Excellent	0%	OC/SN	3-4	N	Peninsula	AR	NO SIGHTINGS										
11/17/2020	1025	1625	6:00	Vibratory Hammer	27.6-inch	Sheets	9	Good-Excellent	0-5%	PC	3	N	Safeway	RK	Vibratory Hammer	HPBK	1120	1138	1	TR(S)	1,500m	N	Y	NONE	Same HPBK as Project sighting #1. Traveling south-outside B zone.
11/18/2020	1056	1620	5:24	Vibratory Hammer	27.6-inch	Sheets	7	Good	0-5%	R/OC/SN	2	S	Project Site	DR	Vibratory Hammer	HPBK	1215	1330	1	TR(S)/WJ/CH/FO	100m-450m	Y	N	DE/SD	Same HPBK was feeding in the area all day. Start of work was delayed due to feeding and milling within B zone. Decided to start work with a B take-exited zone to south. Moved close to shutdown zone twice so work was stopped for a shirt period twice. Exited the zone to the south late in the day.
11/18/2020	1056	1620	5:24	Vibratory Hammer	27.6-inch	Sheets	7	Good-Excellent	0%	L/R/OC/SN	1-2	S/E/SE	Peninsula	AR	Vbratory Hammer	STSL	1240	1244	2	MI/SW(N)	3,400m	N		NONE	Swimming around just north of zone-not in B zone.
11/18/2020	1056	1620	5:24	Vibratory Hammer	27.6-inch	Sheets	7	Good-Excellent	0%	L/R/OC/SN	1-2	S/E/SE	Peninsula	AR	Vibratory Hammer	HPBK	1507	1509	1	SW	1,300m-1,700m	Y	Y	NONE	Same HPBK as Project Sighting #1. Just north of edgewater; lots of bird activity. Moved between the green buoy #9 and float plane dock at the airport.
11/18/2020	1056	1620	5:24	Vibratory Hammer	27.6-inch	Sheets	7	Moderate-Good	0-5%	L/R	3	E	Safeway	RK	Vibratory Hammer	HPBK	1248	1538	1	TR (N/S)/MI	1,700m-2,700m	N	Y	NONE	Same HPBK as Project Sighting #1. Outside of the zone and heading south. Adjacent to Revilla shoreline-outside B zone. Travelling north.
11/19/2020	1210	1620	4:10	Vibratory Hammer	27.6-inch	Sheets	6	Good	0%	PC/R/OC	1-2	SE	Project Site	DR	Vibratory Hammer	HPBK	1212	1518	1	FO/CH/TR(S)/DI	300m-800m	Y	N	NONE	Feeding on the northern edge of work site. Slowly moving south feeding. Exited B zone to the south with a few spouts. Reentered the area and kept moving north along gravine shoreline. Exited the B zone to the south again.
11/19/2020	1210	1620	4:10	Vibratory Hammer	27.6-inch	Sheets	6	Excellent	0%	L/R/SN	2	E/SE	Peninsula	AR	Vibratory Hammer	HSEA	1310	1555	1	MI	3,400m	N		NONE	Spent most of the day in the cove just behind the point-Not in B zone.
11/19/2020	1210	1620	4:10	Vibratory Hammer	27.6-inch	Sheets	6	Excellent	0%	L/R/SN	2	E/SE	Peninsula	AR	Vibratory Hammer	HPBK	1445	1505	1	FO/SW(E/S)/DI	1,300m-1,700m	Y	Y	NONE	Same HPBK as Project Sighting #1. Lunge feeding near the edgewater dock on revilla shoreline. Swam towards middle of channel before diving not in B zone. Surfaced on Gravina side in B zone next to green buoy #10.
11/19/2020	1210	1620	4:10	Vibratory Hammer	27.6-inch	Sheets	6	Poor-Good	0-5%	PC/L	1-3	E	Safeway	RK	Vibratory Hammer	HPBK	1356	1538	1	MI/SW(S)/TR(N)/FO	1,600m-2,500m	N	Y	NONE	Same HPBK as Project Sighting #1. Feeding and heading south slowly-Outside B zone. Turned and traveled north-outside B zone. Spouted and travelled out of B zone near gravina shoreline.
11/20/2020	1345	1510	1:25	NONE				Excellent	0-5%	PC	1	SE	Project Site	DR	NO SIGHTINGS										
11/20/2020	1345	1510	1:25	NONE				Excellent	0-5%	PC/OC	1	NE	Peninsula	AR	NO SIGHTINGS										
11/20/2020	1345	1510	1:25	NONE				Excellent	0-15%	S	0	W	Safeway	RK	NONE	STSL	1426	1428	1	LO/SW(S)/SI	2,100m	N		NONE	Not in B Zone. Swimming South.
12/4/2020	1330	1525	1:55	Vibratory Hammer	27.6-inch	Sheets	3	Moderate	0%	L/F/OC	4	SE	Project Site	DR	NO SIGHTINGS										
12/4/2020	1330	1525	1:55	Vibratory Hammer	27.6-inch	Sheets	3	Poor-Moderate	0%	HR	6	SE	Peninsula	AR	NO SIGHTINGS										
12/4/2020	1330	1525	1:55	Vibratory Hammer	27.6-inch	Sheets	3	Good	0%	L/R	5	SE	Gravina	TM	NO SIGHTINGS										
12/5/2020	1325	1605	2:40	Vibratory Hammer	27.6-inch	Sheets	3	Moderate	0%	OC/HR	4	SE	Project Site	DR	NO SIGHTINGS										
12/5/2020	1325	1605	2:40	Vibratory Hammer	27.6-inch	Sheets	3	Poor-Moderate	0%	HR	6	SE	Peninsula	AR	NO SIGHTINGS										
12/5/2020	1325	1605	2:40	Vibratory Hammer	27.6-inch	Sheets	3	Moderate	0%	HR	5	SE	Gravina	TM	NO SIGHTINGS										
12/7/2020	1330	1530	2:00	Vibratory Hammer	24-inch	Permanent	0	Moderate-Excellent	0%	R/OC	2	SE	Project Site	DR	NO SIGHTINGS										
12/7/2020	1330	1530	2:00	Vibratory Hammer	24-inch	Permanent	0	Moderate-Good	0%	R	2-4	SE	Peninsula	AR	NONE	HSEA	1334	1415	1	RE	3,400m	N	N	NONE	Not in zone. Just hanging out at peninsula point approx 5m off shore.
12/7/2020	1330	1530	2:00	Vibratory Hammer	24-inch	Permanent	0	Moderate-Good	0%	R/OC/HR	3	SE	Gravina	TM	NONE	HSEA	1341		1	LO	500m	N	N	NONE	
12/11/2020	720	1055	3:35	Vibratory Hammer	24-inch	Permanent	1	Good-Excellent	0-5%	S/PC	1	NW	Project Site	DR	Vibratory Hammer	HPBK	817	825	1	CH/TR(N)/DI	1,000m-1,500m	Y	Y	NONE	Same sighting as 1.2 at Gravina. Slowly travelling north past work site.
12/11/2020	720	1055	3:35	Vibratory Hammer	24-inch	Permanent	1	Good-Excellent	5-10%	S/PC	0-1	NE	Peninsula	RV	Vibratory Hammer	HPBK	820	855	1	TR(N)/NE	1,100m-4,200m	Y	Y	NONE	Handed off to peninsula observer.
12/11/2020	720	1055	3:35	Vibratory Hammer	24-inch	Permanent	1	Excellent	0%	S	0	N	Gravina	TM	NONE	HPBK	745	817	1	SW(S)/SW(N)/DI	400m-1,500m	N	N	NONE	Same sighting as Gravina and Project Site. Left B zone.
12/12/2020	730	1150	4:20	Vibratory Hammer	24-inch	Permanent	2	Good-Excellent	0-5%	S/PC	1	SE	Project Site	DR	NONE	STSL	804	809	1	SW(N)	500m	N	N	NONE	First sighted swimming south not in B zone, took 3 breaths and then dove. Swam North and entered B zone. Lost sighting at float plane dock and transferred to Project Site Observer.
12/12/2020	730	1150	4:20	Vibratory Hammer	24-inch	Permanent	2	Moderate-Good	0-5%	S/F/OC	1-2	E	Peninsula	RV	NONE	HSEA	950	1000	2	LO	3,400m	N	N	NONE	Pre-construction. Milling and swimming north. Dove out of sight.
12/12/2020	730	1150	4:20	Vibratory Hammer	24-inch	Permanent	2	Poor-Excellent	0%	S/PC/H/OC	0-1	S	Gravina	TM	Vibratory	HSEA	755	1146	1	SW(S)/SW(N)/LO/RE	500m-650m	Y	N	NONE	Out of zone. Popping heads up every now and then.
12/13/2020	800	1245	4:45	Vibratory Hammer	24-inch	Permanent	1	Excellent	0%	PC/OC	1-2	SE	Project Site	DR	NO SIGHTINGS										
12/13/2020	800	1245	4:45	Vibratory Hammer	24-inch	Permanent	1	Excellent	0-5%	OC	2-3	SE	Peninsula	AR	NONE	HSEA	1238		1	LO/SI	3,400m	N	N	NONE	Not in zone. Right next to Peninsula Point
12/13/2020	800	1245	4:45	Vibratory Hammer	24-inch	Permanent	1	Excellent	0%	L/OC	2-3	S	Gravina	TM	Vibratory Hammer	HSEA	839	1245	1	SW(N)/LO/RE	500m	Y	N	NONE	Swimming past airport while ferry pulled out in B zone. Diving for 7-10 minutes and resting at surface next to beach in zone.
12/14/2020	850	1250	4:00	Vibratory Hammer	24-inch	Permanent	1	Good	0%	L/OC	2-3	SE	Project Site	DR	NO SIGHTINGS										
12/14/2020	850	1250	4:00	Vibratory Hammer	24-inch	Permanent	1	Good-Excellent	0%	L/R/OC	1-2	SE	Peninsula	AR	NONE	STSL	905	930	1	SW(N)/LO/SI	2,200m-5,400m	N	N	NONE	Swimming just west of red buoy #10. Lots of birds around. Not in Level B zone. Pre-construction. Surfaced again just of Peninsula Point and again just south of Channel Island.
12/14/2020	850	1250	4:00	Vibratory Hammer	24-inch	Permanent	1	Good-Excellent	0%	L/R/OC	1-2	SE	Peninsula	AR	NONE	STSL	944	1001	1	SW(N)/LO/SI	3,000m-4,000m	N	N	NONE	Sighted mid-channel north of Peninsula Point. Not in Level B zone.
12/14/2020	850	1250	4:00	Vibratory Hammer	24-inch	Permanent	1	Good	0%	R/OC	1-3	SE	Gravina	TM	Vibratory Hammer	HSEA	933	1233	1	LO/RE	500m	Y	N	NONE	Diving for 7-10 minutes; resting/looking at surface in B zone.
12/15/2020	925	1355	4:30	Vibratory Hammer	24-inch	Permanent	2	Good	0%	L/R/OC	2-3	SE	Project Site	DR	NONE	HSEA	1154	1201	1	MI/TR(N)/SI	600m	N	N	NONE	watched it surface several times and mill about. Started moving north.
12/15/2020	925	1355	4:30	Vibratory Hammer	24-inch	Permanent	2	Good-Excellent	0-5%	L/R/OC	2-3	SE	Peninsula	AR	Vibratory Hammer	STSL	1105	1108	1	FO/SI	5,000m	Y	N	NONE	Surfaced with fish in mouth. Lots of bird activities. In Level B Zone.
12/15/2020	925	1355	4:30	Vibratory Hammer	24-inch	Permanent	2	Good-Excellent	0-5%	L/R/OC	2-4	SE	Peninsula	AR	NONE	STSL	1213	1230	1	SW/TR(N)	3,400m-3,800m	N	N	NONE	Surfaced several times swimming north 10m off of Peninsula Point. Not in B Zone.
12/15/2020	925	1355	4:30	Vibratory Hammer	24-inch	Permanent	2	Good-Excellent	0%	L/OC/HR	2-3	SE	Gravina	TM	Vibratory Hammer	HSEA	948	1328	1	LO/RE	500m-515m	Y	N	NONE	Floating next to beach south of airport ferry pullout. Diving for 7-10 minutes next to beach. In Level B zone.
12/16/2020	955	1453	4:58	Vibratory Hammer	24-inch	Permanent	2	Good	0%	OC	2	SE	Project Site	DR	NONE	HSEA	1115	1117	1	TR(N)/SI	500m	N	N	NONE	Moving north along shoreline. No Exposure.
12/16/2020	955	1453	4:58	Vibratory Hammer	24-inch	Permanent	2	Good	0%	PC/OC	3	SE	Peninsula	RV	NO SIGHTINGS										
12/16/2020	955	1453	4:58	Vibratory Hammer	24-inch	Permanent	2	Good	0%	L/OC	1	SE	Gravina	TM	Vibratory Hammer	HSEA	1021	1443	1	LO/RE	500m	Y	N	NONE	Diving for 7-10 minutes; resting/looking at surface in B zone.
12/16/2020	955	1453	4:58	Vibratory Hammer	24-inch	Permanent	2	Good	0%	L/OC	1	SE	Gravina	TM	NONE	STSL	1446	1447	1	TR	500m	N	N	NONE	In level B zone; no take.
12/17/2020	1140	1525	3:45	Vibratory Hammer	24-inch	Permanent	3	Moderate-Good	0%	R/OC	2-3	SE	Project Site	DR	NO SIGHTINGS										
12/17/2020	1140	1525	3:45	Vibratory Hammer	24-inch	Permanent	3	Good	0%	OC	4	SE/SW	Peninsula	RV	NONE	HSEA	1345	1356	1	LO	3,400m	N	N	NONE	20-100m from observer. Not in Zone.
12/17/2020	1140	1525	3:45	Vibratory Hammer	24-inch	Permanent	3	Moderate	0%	R/OC	2-3	SE	Gravina	TM	Vibratory Hammer	HSEA	1217	1438	1	LO/RE	500m	Y	N	NONE	Diving for 7-10 minutes; resting/looking at surface in B zone.
12/18/2020	1150	1600	4:10	Vibratory Hammer	24-inch	Permanent	1	Good	0%	PC/L/R/OC	2-3	NW	Project Site	DR	NO SIGHTINGS										
12/18/2020	1150	1600	4:10	Vibratory Hammer	24-inch	Permanent	1	Excellent	0%	L/OC	1	NE	Peninsula	AR	NO SIGHTINGS										
12/18/2020	1150	1600	4:10	Vibratory Hammer	24-inch	Permanent	1	Moderate-Excellent	0%	L/OC	2	NW	Gravina	TM	Vibratory Hammer	HSEA	1300	1512	1	LO/RE	500m	Y	N	NONE	Diving for 7-10 minutes; resting/looking at surface in B zone.
12/18/2020	1150	1600	4:10	Vibratory Hammer	24-inch	Permanent	1	Moderate-Excellent	0%	L/OC	2	NW	Gravina	TM	Vibratory Hammer	STSL	1444	1446	1	SW	505m	Y	N	NONE	
12/20/2020	1300	1405	1:05	Vibratory Hammer	24-inch	Permanent	3	Excellent	0-5%	S/PC	2	NW/SE	Project Site	DR	NONE	STSL	1344	1345	1	TR(S)/SI	300m-800m	N	N	NONE	Moving SE away from work site.
12/20/2020	1300	1405	1:05	Vibratory Hammer	24-inch	Permanent	3	Excellent	0-5%	PC/OC	1-2	NE/SE	Peninsula	AR	Vibratory Hammer	HSEA	1310	1424	1	RE/SI/LO	3,400m	N	N	NONE	Hanging out right off Peninsula Point. Not in B zone.
12/20/2020	1300	1405	1:05	Vibratory Hammer	24-inch	Permanent	3	Good-Excellent	0%	PC	1	NW	Gravina	TM	Vibratory Hammer	HSEA	1313	1523	1	LO/RE	500m	Y	N	NONE	In level B zone.

Attachment C: Marine Mammal Observation Record Forms

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until Jan 28, 2021