E 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XF657]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to U.S. Army Corps of Engineers Miller Sands Island, Rice Island, and Cottonwood Island Pile Dike Repairs Projects on the Lower Columbia River in Oregon and Washington

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorizations; request for comments on proposed authorizations and possible renewals.

SUMMARY: NMFS has received a request from U.S. Army Corps of Engineers (USACE) for authorization to take marine mammals incidental to the Miller Sands-Rice Island Pile Dike Repairs Project (MSRI Project) and Cottonwood Island Pile Dike Replacement Project (CI Project) on the lower Columbia River (LCR) in Oregon and Washington. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue two incidental harassment authorizations (IHAs) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on possible one-time, 1-year renewals that could be issued under certain circumstances and if all requirements are met, as described in **Request for Public Comments** at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than [*INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER*].

ADDRESSES: Comments should be addressed to Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service and should be submitted via email to *ITP.demarest@noaa.gov*. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act/incidental-take-authorizations-construction-activities.* In case of problems accessing these documents, please call the contact listed below.

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments, including all attachments, must not exceed a 25-megabyte file size. All comments received are a part of the public record and will generally be posted online at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act* without change. All personal identifying information (*e.g.*, name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Austin Demarest, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the "take" of marine mammals, with certain exceptions. Section 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) directs the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are proposed or, if the taking is limited to harassment, a notice of a proposed IHA is provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking; other "means of effecting the least practicable adverse impact" on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to as "mitigation"); and requirements pertaining to the monitoring and reporting of the takings. The definitions of all applicable MMPA statutory terms used above are included in the relevant sections below (*see also* 16 U.S.C. 1362; 50 CFR 216.3, 216.103).

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action (*i.e.*, the issuance of an IHA) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for NAO 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has preliminarily determined that the issuance of the proposed IHAs qualifies to be categorically excluded from further NEPA review.

We will Review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the IHA requests.

Summary of Request

On April 10, 2025, and May 9, 2025, NMFS received requests from USACE for two IHAs to take marine mammals incidental to pile driving (installation and removal) associated with construction to replace pile dikes at Miller Sands-Rice Island and Cottonwood Island on the lower Columbia River in Oregon and Washington. Following NMFS' review of each original application and multiple revised versions, USACE submitted revised versions for the MSRI Project and CI Project on March 9, 2026, and March 12, 2026, respectively. NMFS subsequently deemed the applications complete on March 26, 2026. USACE's request for the MSRI Project is for take of harbor porpoises, Steller sea lions, California sea lions, and harbor seals, by Level B harassment, and for a subset of these species, by Level A harassment. For the CI Project, USACE's request is for take of Steller sea lions, California sea lions, and harbor seals, by Level A and Level B harassment. Neither USACE nor NMFS expect serious injury or mortality to result from this activity and, therefore, IHAs are appropriate.

Description of Proposed Activity

Overview

The USACE proposes repairing and replacing pile dikes for two separate projects at different locations on the lower Columbia River (LCR). The projects would restore flood control, prevent erosion, maintain safe vessel passage, and reduce the frequency and need of maintenance dredging in the LCR. The USACE MSRI Project would repair and replace three existing pile dikes between river mile (RM) 23 and RM 25 near Altoona, Washington. The project includes removing debris and degraded timber piles, enhancing or extending enrockment which would replace three existing timber pile dikes, and connecting two of these three pile dikes together (connector). After enrockment is in place, eight steel Aid to Navigation (ATON) piles would be installed along the enrockment to mark the new pile dikes and pile dike connector. In-water construction is

anticipated over 4 months between November 2026 through February 2027 in Wahkiakum County, Washington, and Clatsop County, Oregon.

The USACE CI Project would repair or replace 10 existing pile dikes between RM 68 and RM 71 in the LCR, southeast and directly upstream of Longview, Washington in Cowlitz County. The project would include construction of new shore attachments for 5 pile dikes, installing new steel marker piles at 10 pile dikes, enhancing or extending enrockment in place of existing pile dikes, and construction of up to 3 material offload facilities on Cottonwood Island. Construction for the CI Project is expected to occur over 4 months from November 2026 through February 2027. Activities from both projects that have the potential to result in Level A harassment and Level B harassment of marine mammals from underwater sound production include impact and vibratory pile installation and vibratory pile removal.

Dates and Duration

Each of these proposed IHAs would be valid for the statutory maximum of 1 year from the date of effectiveness. They would become effective upon written notification from the applicant to NMFS, but not beginning later than 1 year from the date of issuance or extending beyond 2 years from the date of issuance.

The MSRI Project is scheduled to span 5 months, with pile driving being restricted to a 4-month window between November 2026 and March 2027. Debris and pile removal would require approximately 15 days, while pile installation would take approximately 8 days; construction days may be non-consecutive.

The CI Project is scheduled to occur over 4 months, from November 2026 through February 2027. Permanent and temporary pile installation or removal would take approximately 66 non-consecutive days. Activities for both projects would occur during daylight hours, specifically from 30 minutes before civil dawn to 30 minutes after civil dusk.

Specific Geographic Region

The LCR flows 146 miles (mi) or 235 kilometers (km) from Bonneville Dam to the Pacific Ocean. This reach of the river features a deep-draft shipping channel supporting major ports and connects major cities and towns in Oregon and Washington to the Pacific Ocean. The LCR serves as an important migratory corridor for salmonids, sturgeon, and eulachon (*Thaleichthys pacificus*) as they transition freshwater and marine life stages, while providing foraging opportunities for pinnipeds and other wildlife.

The Miller Rice pile dike system consists of seven Pile Dolphins (PDs) located between Miller Sands Island and Rice Island, extending from RM 22.75 to RM 24.63 in Wahkiakum County, Washington, and Clatsop County, Oregon (figure 1). The structures are identified by their RM location: PDs 22.75, 23.07, 23.39, 23.67, 23.71, 23.81, and 24.63. The MSRI Project would replace three of these PDs (*i.e.*, 23.71, 23.81, and 24.63) which are situated approximately 13.5 km upstream and east of Astoria, Oregon, along the Federal Navigation Channel. The area experiences frequent vessel traffic, including recreational boats, tugboats, and large cargo vessels, which all contribute to the in-air and underwater acoustic environment.

The CI Project construction area is located between RM 68 and RM 71 of the LCR in Cowlitz County, Washington (figure 2). A total of 10 PDs would be replaced along Cottonwood Island in the Columbia River at RM 68.35, 68.57, 68.79, 69.01, 69.25, 69.51, 69.79, 70.07, 71.17, and 71.51. The project site is approximately 3.5 km upstream and southeast of Longview, Washington, directly south of the Cowlitz River confluence with the Columbia River. The CI Project area is situated within a highly industrialized area, and experiences frequent recreational and commercial vessel traffic, which all contribute to the in-air and underwater acoustic environment.

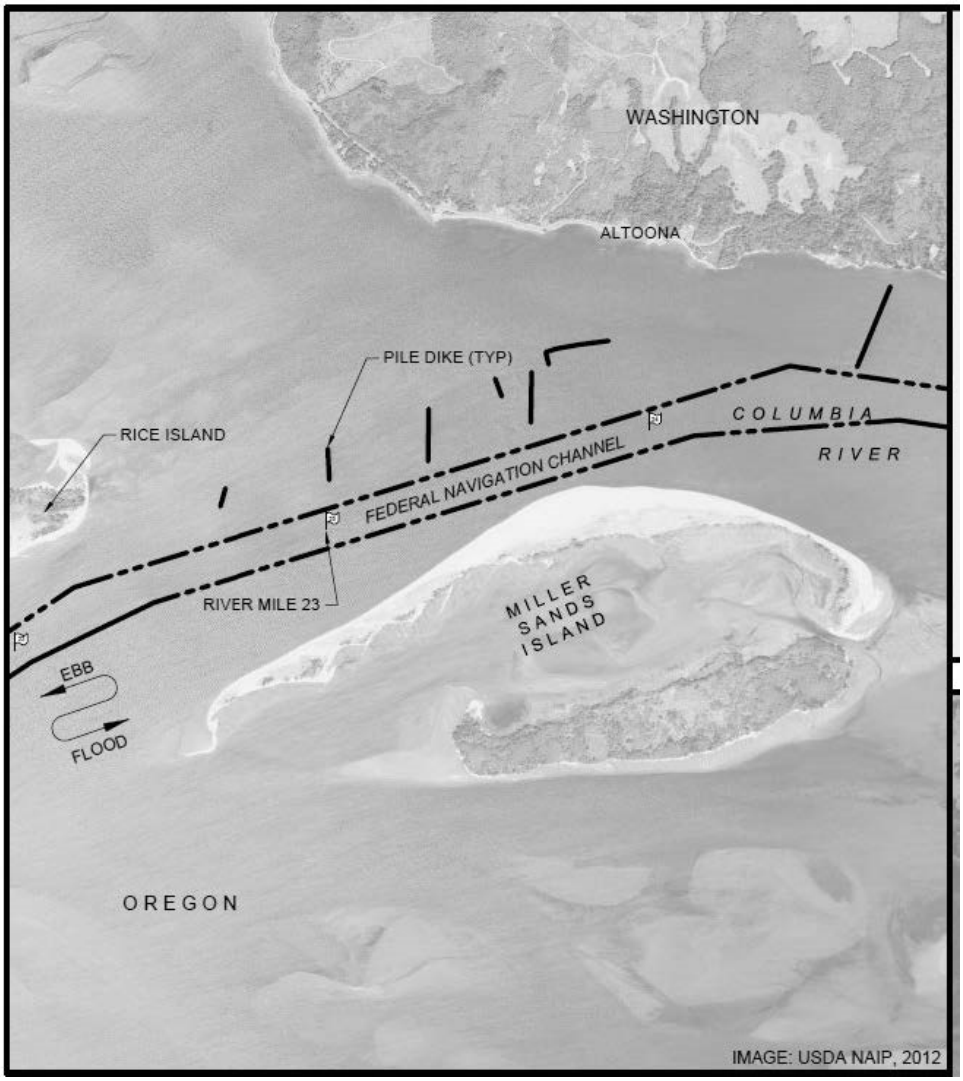

Figure 1 -- USACE Miller Sands-Rice Island Dike Repairs Project Site Map

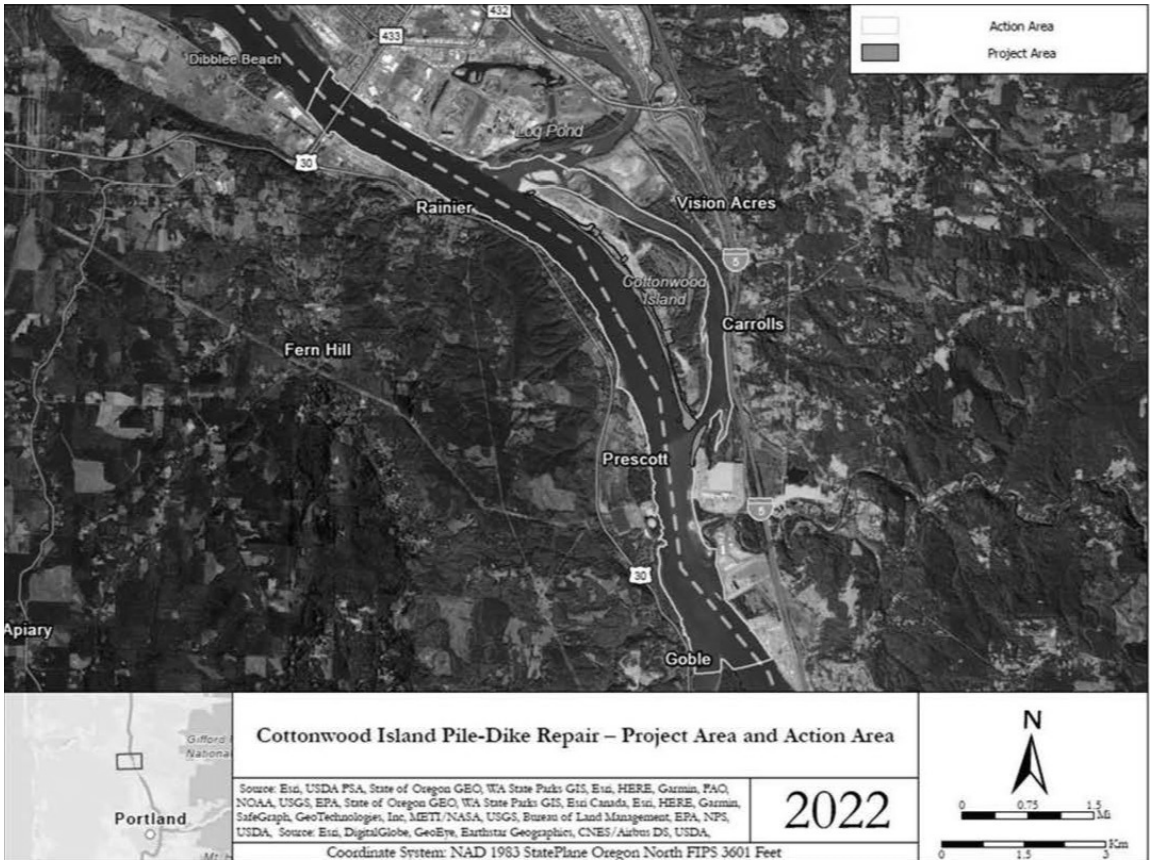

Figure 2 -- USACE Cottonwood Island Dike Repairs Project Site Map

Detailed Description of the Specified Activity

The MSRI Project and the CI Project are needed to manage sediments, direct flow, provide bank protection, reduce the frequency and need of dredging, and to improve navigability within the LCR Federal Navigation Channel (FNC). The present-day pile dike system was built from 1917 through 1923 and from 1933 through 1939. After decades of deferred maintenance and repairs, the LCR pile dike system no longer functions as initially designed. Therefore, both of these proposed projects would replace degraded pile dikes and improve vessel navigability within sections of the FNC in the Columbia River.

The MSRI Project involves five construction activities:

1. Removing debris behind existing pile dikes.

2. Removing degraded timber piles, spreaders, and hardware.

3. Enhancing enrockment at three PDs (23.71, 23.81, and 24.63) by mechanically placing rock on the prior PD footprint and connecting enrockment between PD 23.71 and PD 23.81.

4. Installing eight new isolated ATON piles.

5. Site access and staging.

Debris removal and disposal would be followed by mechanical removal by direct pull methods or breaking existing timber piles at the mudline; therefore, vibratory pile extraction would not be necessary. Rock would be transported by barge and placed at each dike location using a crane or long-arm excavator with a clamshell bucket, orange peel grapple, or excavator bucket. Rocks (ranging from 50 to 1,000 pounds [22 to 454 kilograms]) would be lowered below the water's surface and released directly above the existing substrate. Rock placement would occur during the in-water work window (November–February), as well as in September and October.

After rock placement, eight new 24-inch steel pipe ATON piles would be installed to mark each PD and the PD connector. Vibratory hammers would be used to drive ATON piles to the point of refusal and then an impact hammer would be used to ensure that the piles are seated in the substrate. Impact and vibratory pile installation would occur over 8 days and sound produced from these activities has the potential to result in incidental take of marine mammals by Level A and Level B harassment. Activities 1, 2, 3, and 5 are not expected to cause take of marine mammals because these activities do not produce sound with characteristics likely to result in marine mammal harassment and are thus not discussed further.

Table 1 -- MSRI Project Pile Installation Summary

Method	Pile Size, Material	Pile Type and Location	Piles/Day (min-max)	Time (minutes) or (strikes/pile)	Number of Piles	Min Duration (days)	Max Duration
Vibratory	24-inch steel pipe	ATON-PD 23.71	1-8	12	2	1	2
Impact				(225)			
Vibratory	24-inch steel pipe	ATON / Enrockment between PD 23.71 and PD 23.81		12	1		1
Impact				(225)			
Vibratory	24-inch steel pipe	ATON / PD 23.81		12	2		2
Impact				(225)			
Vibratory	24-inch steel pipe	ATON / 24.63		12	3		3
Impact				(225)			
Totals					8	1	8

The Cottonwood Project involves 5 construction activities:

1. Construction and removal of Material Offload Facilities (MOF).

2. Removal of 162 existing timber piles.

3. Installation of 114 new 12-inch timber piles offset from the original 5 PDs at RM 68.35, 69.01, 69.51, 69.76, and 70.7.

4. Installation of 17 steel pipe ATON piles between 10.75-24-inches in diameter.

5. Adding rock around the new piles for scour protection.

All materials associated with the CI Project would initially be transported by barges and tugboats to the construction site, which would be anchored in place with

spuds. The MOF piles would be installed with a vibratory hammer and consist of 18 24-inch steel pipe piles and 100 24-inch steel sheet piles. A maximum of three MOFs can be built over 21 days and then removed over 10.5 days using vibratory methods. Existing damaged piles would be removed by vertical pull or by breaking them off at the mudline.

New piles would be installed using a vibratory hammer to the point of refusal and then an impact hammer would be used to ensure piles are seated in the substrate. Both timber and steel ATON piles can be installed on the same day, but only one pile at a time, with a maximum of 8 piles per day. Pile installation would occur over approximately 34 days.

All project activities, except for PD 68.35, would take place anytime during the in-water work window from November 2026 to February 2027. Work on PD 68.35 would be restricted to November due to its close proximity (200 meters (m)) to a seasonal pinniped haulout site. Activities 1, 3, and 4, which involve pile installation and removal with vibratory and impact hammers, and sound produced from these activities has the potential to result in incidental take of marine mammals by Level A and Level B harassment. Activities 2 and 5 are not expected to cause take of marine mammals because these activities do not produce sound with characteristics likely to result in marine mammal harassment and are thus not discussed further.

Table 2 -- CI Project Pile Installation and Removal Summary

Method	Pile Size, Material	Pile Type and/or Location	Time/Pile (minutes), (strikes/pile)	Number of Piles	Max Piles/Day	Min Duration (days)	Expected Duration (days)
Installation							
Vibratory	10.75-12-inch steel pipe	ATON	12	11	4	2.75	11
Impact			4.5 (225)				
Vibratory	16-inch steel pipe	ATON	12	4	3	1.5	4
Impact			4.5 (225)				
Vibratory	24-inch steel pipe	ATON	12	2	1	2	2
Impact			4.5 (225)				
Vibratory	12-inch timber pole	PD 68.35	8	14	8	1.8	2
Impact			4.5 (225)				
Vibratory			8	14	8	1.8	2

Impact	12-inch timber pole	PD 69.01	4.5 (225)				
Vibratory	12-inch timber pole	PD 69.51	8	18	8	2.3	3
Impact			4.5 (225)				
Vibratory	12-inch timber pole	PD 69.76	8	35	8	4.4	5
Impact			4.5, (225)				
Vibratory	12-inch timber pole	PD 70.7	8	33	8	4.1	5
Impact			4.5, (225)				
Vibratory	24-inch steel pipe	MOF 1	12	18	8	2.25	3
Vibratory	24-inch steel sheet	MOF 1	10	100	25	4	4
Vibratory	24-inch steel pipe	MOF 2	12	18	8	2.25	3
Vibratory	24-inch steel sheet	MOF 2	10	100	25	4	4
Vibratory	24-inch steel pipe	MOF 3	12	18	8	2.25	3
Vibratory	24-inch steel sheet	MOF 3	10	100	25	4	4
Total Duration of Pile Installation (days)						39.4	55
MOF Removal							
Vibratory	24-inch steel pipe	MOF 1	12	18	8	2.25	3
Vibratory	24-inch steel sheet	MOF 1	3	100	200	0.5	0.5
Vibratory	24-inch steel pipe	MOF 2	12	18	8	2.25	3
Vibratory	24-inch steel sheet	MOF 2	3	100	200	0.5	0.5
Vibratory	24-inch steel pipe	MOF 3	12	18	8	2.25	3
Vibratory	24-inch steel sheet	MOF 3	3	100	200	0.5	0.5
Total Duration of Pile Removal (days)						8.25	10.5
Total Duration of Pile Driving and Removal (days)						47.65	65.5

Proposed mitigation, monitoring, and reporting measures are described in detail later in this document (please see **Proposed Mitigation** and **Proposed Monitoring and Reporting**).

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history of the potentially affected species. NMFS fully considered all of this information, and we refer the reader to these descriptions, instead of reprinting the information. Additional information regarding population trends and threats may be found in NMFS' Stock

Assessment Reports (SARs; *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS' website (*https://www.fisheries.noaa.gov/find-species*).

Table 3 lists all four species and stocks for which take is expected and proposed to be authorized for the MSRI Project and a subset of three species (California sea lion, Steller sea lion, and harbor seal) for which take is expected and proposed to be authorized the CI Project. Tables 3 summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS' SARs). While no serious injury or mortality is anticipated or proposed to be authorized here, PBR and annual serious injury and mortality (M/SI) from anthropogenic sources are included here as gross indicators of the status of the species or stocks and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. Alaska and Pacific SARs. All values presented in table 3 are the most recent available at the time of publication (including from the draft 2024 SARs) and are available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*.

Table 3 -- Species[1] with Estimated Take from the Specified Activities

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[2]	Stock abundance (CV, Nmin, most recent abundance survey)[3]	PBR	Annual M/SI[4]
Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Family Phocoenidae (porpoises)						
Harbor Porpoise[5]	*Phocoena phocoena*	Northern OR/ WA Coast	-, -, N	22,074 (0.391, 16,068, 2022)	161	≥3.2
Order Carnivora – Pinnipedia						
Family Otariidae (eared seals and sea lions)						
CA Sea Lion	*Zalophus californianus*	U.S.	-, -, N	257,606 (N/A, 233,515, 2014)	14,011	>321
Steller Sea Lion	*Eumetopias jubatus*	Eastern	-, -, N	36,308 (N/A, 36,308, 2022)[6]	2,178	93.2
Family Phocidae (earless seals)						
Harbor Seal	*Phoca vitulina*	OR/WA Coastal	-, -, N	22,549 (UNK, 19,561, 2022)[7]	UND[8]	10.6

1 – Information on the classification of marine mammal species can be found on the web page for The Society for Marine Mammalogy's Committee on Taxonomy (*https://marinemammalscience.org/science-and-publications/list-marine-mammal-species-subspecies*).
2 - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.
3 - NMFS marine mammal stock assessment reports online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region*. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance.
4 - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.*, commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.
5 - Incidental take of harbor porpoises is not expected or proposed for authorization for the CI Project
6 - Nest is best estimate of counts, which have not been corrected for animals at sea during abundance surveys. Estimates provided are for the U.S. only.
7 - Most recent SAR does not include an abundance estimate for this stock. These data are for the Washington coast and thus underestimate the size of the OR/WA Coastal stock; estimates are from Pearson *et al.* 2024.
8 - UND means undetermined.

As indicated above, all four species (with four managed stocks) of marine mammals in table 3 spatially and temporally co-occur to the degree that take is reasonably likely to occur in the proposed MSRI Project area. However, California sea lions, Steller sea lions, and harbor seals could spatially co-occur within the CI Project area to the degree that take is reasonably likely to occur.

While gray whales, humpback whales, killer whales, and northern elephant seals have been reported in the LCR, the temporal or spatial occurrence of these species is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. Gray whales, humpback whales, and killer whales have been documented in the LCR, but sightings of these animals have primarily been at RM 11 and below, and sightings above this area are considered rare (no sightings in recent years) within both project areas. Northern elephant seals have been documented within the LCR but all reported sightings of these species within the project areas are over 40 years old and all recent sightings have occurred below RM 11 in the Columbia River. Therefore, take of these species is not expected nor proposed to be authorized and these species are not considered further in this document.

Harbor Porpoise

In the eastern North Pacific Ocean, harbor porpoises are found in coastal and inland waters from Point Barrow, along the Alaskan coast, and down the west coast of North America to Point Conception, California. Harbor porpoises are known to occur year-round in the inland trans-boundary waters of Washington and British Columbia, Canada and along the Oregon/Washington coast.

Harbor porpoise movement along west coast of the United States is relatively restricted and they do not move extensively between California, Oregon, and Washington (Calambokidis and Barlow, 1991). The Northern Oregon/Washington Coast stock of harbor porpoises ranges from Lincoln City, Oregon, to Cape Flattery, Washington and the stock commonly occurs in the Columbia River Estuary (Carretta *et al.*, 2020). Their nearshore abundance peaks with anchovy presence, which is generally June through October. In 2024, three harbor porpoises were documented over 33 days of marine mammal monitoring for year 2 of USACE's East and West Sand Island Pile Dike Repairs Project at RM 4. Considering the spatial and temporal distribution, harbor porpoises

could occur in the MRSI Project area but are not unexpected to occur in the CI Project area.

California Sea Lion

California sea lions are found along the west coast from the southern tip of Baja California to southeast Alaska. They breed mainly on offshore islands from Southern California's Channel Islands south to Mexico. Non-breeding males often roam north in spring foraging for food. Since the mid-1980s, increasing numbers of California sea lions have been documented feeding on fish along the Washington coast and—more recently—in the Columbia River as far upstream as Bonneville Dam, at RM 146. However, the total number of California sea lions observed at Bonneville Dam has been in decline, ranging from 195 individuals in 2015 to 24 individuals in 2021, and 50 individuals in 2023 (Braun *et al.*, 2024).

In recent years, California sea lions have been reported below Bonneville Dam (RM 146) feeding on returning white sturgeon (*Acipenser transmontanus*) and adult salmonids (Braun *et al.*, 2024). California sea lions have been observed hauling out at East Mooring Basin in Astoria, Oregon, city docks in Rainier, Oregon, and the Cowlitz River mouth in Longview, Washington (Oregon Department of Fish and Wildlife [ODFW], 2024). Considering the spatial and temporal distribution, California sea lions are expected to occur in both the MSRI and CI Project areas.

Steller Sea Lion

Steller sea lions that occur in the LCR, including the project vicinity, are members of the eastern Distinct Population Segment (DPS), ranging from Southeast Alaska to central California, including both Oregon and Washington (Jeffries *et al.*, 2000; Scordino, 2006; NMFS, 2013). In Washington, Steller sea lions occur mainly along the outer coast from the Columbia River to Cape Flattery (Jeffries *et al.*, 2000). The eastern DPS of Steller sea lions has historically bred on rookeries located in Southeast Alaska,

British Columbia, Oregon, and California. However, within the last several years, a new rookery has become established on the outer Washington coast at the Carroll Island and Sea Lion Rock complex (Muto *et al.*, 2019).

Steller sea lions have also been observed at the base of Bonneville Dam (RM 146) in recent years, feeding on white sturgeon (*Acipenser transmontanus*) and salmonids (Braun *et al.*, 2024). Steller sea lions have been observed hauling out at the South Jetty at the mouth of the Columbia River, city docks in Rainier, OR, and the Cowlitz River mouth in Longview, WA (ODFW, 2024). Considering the spatial and temporal distribution, Steller sea lions are expected to occur in both the MSRI and CI Project areas.

Harbor Seal

Harbor seals are the most common, widely distributed marine mammal found in Washington and Oregon marine waters and are frequently observed in the nearshore marine environment. The Oregon/Washington Coastal Stock was most recently estimated at 22,549 harbor seals in 2024 (Pearson *et al.*, 2024). Harbor seals use hundreds of sites to rest or haulout along coastal and inland waters, including intertidal sand bars and mudflats in estuaries; intertidal rocks and reefs; sandy, cobble, and rocky beaches; islands; and log booms, docks, and floats in all marine areas of the state (Harvey 1987; Jeffries *et al.*, 2003).

Harbor seals in this population are typically non-migratory and reside year-round in the Columbia River and generally remain in the same area throughout the year for breeding and feeding. Pupping seasons in coastal estuaries vary geographically; in the Columbia River, Willapa Bay, and Grays Harbor, pups are born from mid-April through June (Jeffries *et al.,* 2003). Harbor seals in the Columbia River do exhibit some seasonal movement upriver, including into or through both of USACE's proposed project areas, to follow winter and spring runs of Pacific eulachon and outmigrating juvenile salmon

(*Oncorhynchus spp.*), and they are observed regularly in the Columbia River including the action areas. Within the lower Columbia River, they tend to congregate to feed at the mouths of tributary rivers, including the Cowlitz and Kalama rivers (RMs 68 and 73 , respectively). Washington Department of Fish and Wildlife's (WDFW's) atlas of seal and sea lion haulout sites (Jeffries *et al.*, 2000) identifies shoals near the confluence of the Cowlitz and Columbia rivers, one of which is located 200 m from the CI Project site, as a documented haulout site. Additionally, ODFW has documented harbor seals hauled out near the MSRI Project area at Taylor Sands Island, around Green Island, and in Grays Bay during the months of May through June (Edwards, personal communication, 2023). Therefore, harbor seals could enter both of USACE's proposed project areas during in-water construction.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Not all marine mammal species have equal hearing capabilities (*e.g.*, Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007; 2019) recommended that marine mammals be divided into hearing groups based on directly measured (behavioral or auditory evoked potential techniques) or estimated hearing ranges (behavioral response data, anatomical modeling, *etc.*). Generalized hearing ranges were chosen based on the ~65 decibel (dB) threshold from composite audiograms, previous analyses in NMFS (2018), and/or data from Southall *et al.* (2007, 2019). We note that the names of two hearing groups and the generalized hearing ranges of all marine mammal hearing groups have been recently updated (NMFS, 2024) as reflected below in table 4.

Table 4 -- Marine Mammal Hearing Groups (NMFS, 2024)

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 36 kHz
High-frequency (HF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
Very High-frequency (VHF) cetaceans (true porpoises, *Kogia*, river dolphins, Cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	200 Hz to 165 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	40 Hz to 90 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 68 kHz
* Represents the generalized hearing range for the entire group as a composite (*i.e.*, all species within the group), where individual species' hearing ranges may not be as broad. Generalized hearing range chosen based on approximately 65 dB threshold from composite audiogram, previous analysis in NMFS (2018), and/or data from Southall *et al.* (2007, 2019). Additionally, animals are able to detect very loud sounds above and below that "generalized" hearing range.	

For more details concerning these groups and associated frequency ranges, please see NMFS (2024) for a review of available information.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section provides a discussion of the ways in which components of the specified activity may impact marine mammals and their habitat. The **Estimated Take of Marine Mammals** section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The **Negligible Impact Analysis and Determination** section considers the content of this section, the **Estimated Take of Marine Mammals** section, and the **Proposed Mitigation** section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and whether those impacts are reasonably expected to, or reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

Acoustic effects on marine mammal during the specified activities for the MSRI Project and CI Project could occur from impact pile driving and vibratory pile driving

and removal. The effects of underwater noise from USACE's proposed activities have the potential to result in Level A and Level B harassment of marine mammals in the proposed action areas.

Description of Sound Sources

The marine soundscape is comprised of both ambient and anthropogenic sounds. Ambient sound is defined as the all-encompassing sound in a given place and is usually a composite of sound from many sources both near and far (American National Standards Institute (ANSI), 1995). The sound level of an area is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.*, waves, wind, precipitation, earthquakes, ice, atmospheric sound), biological (*e.g.*, sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.*, vessels, dredging, aircraft, construction).

The sum of the various natural and anthropogenic sound sources at any given location and time—which comprise "ambient" or "background" sound—depends not only on the source levels (as determined by current weather conditions and levels of biological and shipping activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10-20 dB from day to day (Richardson *et al.*, 1995). The result is that, depending on the source type and its intensity, sound from the specified activities may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

In-water construction associated with the proposed projects would include impact and vibratory pile driving and removal. The sounds produced by these activities fall into

one of two general sound types: impulsive and non-impulsive. Impulsive sounds (*e.g.*, explosions, gunshots, sonic booms, impact pile driving) are typically transient, brief (less than 1 second), broadband, and consist of high peak sound pressure with rapid rise time and rapid decay (ANSI, 1986; National Institute for Occupational Safety and Health (NIOSH), 1998; ANSI, 2005; NMFS, 2018). Non-impulsive sounds (*e.g.*, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems) can be broadband, narrowband or tonal, brief or prolonged (continuous or intermittent), and typically do not have the high peak sound pressure with rapid rise/decay time that impulsive sounds do (ANSI, 1995; NIOSH, 1998; NMFS, 2018). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.*, Ward 1997 in Southall *et al.*, 2007).

Both impact and vibratory pile hammers would be used on the MSRI and CI Projects. Impact hammers operate by repeatedly dropping a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and Popper, 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak sound pressure levels (SPLs) may be 180 dB or greater but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al.*, 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002; Carlson *et al.*, 2005).

The likely or possible impacts of the USACE's proposed activities on marine mammals could involve both non-acoustic and acoustic stressors. Potential non-acoustic stressors could result from the physical presence of the equipment, vessel, and personnel;

however, we expect that any animals that approach the project sites close enough to be harassed due to the presence of equipment or personnel would be within the Level B harassment zones from pile driving would already be subject to harassment from the in-water activities. Therefore, any impacts to marine mammals are expected to primarily be acoustic in nature. Acoustic stressors would be generated by heavy equipment operation during pile installation and removal (*i.e.*, impact and vibratory pile driving and removal).

Potential Effects of Underwater Sound on Marine Mammals

The introduction of anthropogenic noise into the aquatic environment from impact and vibratory pile driving and removal is the primary means by which marine mammals may be harassed from the USACE's specified activities. Anthropogenic sounds cover a broad range of frequencies and sound levels and can have a range of highly variable impacts on marine life from none or minor to potentially severe responses depending on received levels, duration of exposure, behavioral context, and various other factors. Broadly, underwater sound from active acoustic sources, such as those in the Projects, can potentially result in one or more of the following: temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, stress, and masking (Richardson *et al.*, 1995; Gordon *et al.*, 2003; Nowacek *et al.*, 2007; Southall *et al.*, 2007; Götz *et al.*, 2009).

We describe the more severe effects of certain non-auditory physical or physiological effects only briefly as we do not expect that use of pile driving hammers (impact and vibratory) is reasonably likely to result in such effects (see below for further discussion). Potential effects from impulsive sound sources can range in severity from effects such as behavioral disturbance or tactile perception to physical discomfort, slight injury of the internal organs and the auditory system, or mortality (Yelverton *et al.*, 1973). Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to high level underwater sound or as a secondary effect of

extreme behavioral reactions (*e.g.*, change in dive profile as a result of an avoidance reaction) caused by exposure to sound include neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox *et al.*, 2006; Southall *et al.*, 2007; Zimmer and Tyack, 2007; Tal *et al.*, 2015). Each project's activities considered here do not involve the use of devices such as explosives or mid-frequency tactical sonar that are associated with these types of effects.

In general, animals exposed to natural or anthropogenic sound may experience physical and psychological effects, ranging in magnitude from none to severe (Southall *et al.*, 2007, 2019). Exposure to anthropogenic noise has the potential to result in auditory threshold shifts and behavioral reactions (*e.g.*, avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior). It can also lead to non-observable physiological responses, such an increase in stress hormones. Additional noise in a marine mammal's habitat can mask acoustic cues used by marine mammals to carry out daily functions, such as communication and predator and prey detection.

The degree of effect of an acoustic exposure on marine mammals is dependent on several factors, including, but not limited to, sound type (*e.g.*, impulsive vs. non-impulsive), signal characteristics, the species, age and sex class (*e.g.*, adult male vs. mom with calf), duration of exposure, the distance between the noise source and the animal, received levels, behavioral state at time of exposure, and previous history with exposure (Wartzok *et al.*, 2004; Southall *et al.*, 2007). In general, sudden, high-intensity sounds can cause hearing loss as can longer exposures to lower-intensity sounds. Moreover, any temporary or permanent loss of hearing, if it occurs at all, will occur almost exclusively for noise within an animal's hearing range. We describe below the specific manifestations of acoustic effects that may occur based on each of the activities proposed by the USACE.

Richardson *et al.* (1995) described zones of increasing intensity of effect that might be expected to occur in relation to distance from a source and assuming that the signal is within an animal's hearing range. First (at the greatest distance) is the area within which the acoustic signal would be audible (potentially perceived) to the animal but not strong enough to elicit any overt behavioral or physiological response. The next zone (closer to the receiving animal) corresponds with the area where the signal is audible to the animal and of sufficient intensity to elicit behavioral or physiological responsiveness. The third is a zone within which, for signals of high intensity, the received level is sufficient to potentially cause discomfort or tissue damage to auditory or other systems. Overlaying these zones to a certain extent is the area within which masking (*i.e.*, when a sound interferes with or masks the ability of an animal to detect a signal of interest that is above the absolute hearing threshold) may occur; the masking zone may be highly variable in size.

Below, we provide additional details regarding potential impacts on marine mammals and their habitat from noise in general, starting with hearing impairment, as well as from the specific activities the USACE plans to conduct, to the degree it is available.

Auditory Injury (AUD INJ)—NMFS defines auditory injury as "damage to the inner ear that can result in destruction of tissue . . . which may or may not result in permanent threshold shifts (PTS)" (NMFS, 2024). NMFS defines PTS as a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2024). PTS does not generally affect more than a limited frequency range, and an animal that has incurred PTS has incurred some level of hearing loss at the relevant frequencies; typically, animals with PTS are not functionally deaf (Au and Hastings, 2008; Finneran, 2016). Available data from humans and other terrestrial mammals indicate that a 40-dB

threshold shift approximates PTS onset (see Ward *et al.*, 1958, 1959, 1960; Kryter *et al.*, 1966; Miller, 1974; Ahroon *et al.*, 1996; Henderson *et al.*, 2008). PTS levels for marine mammals are estimates, as with the exception of a single study unintentionally inducing PTS in a harbor seal (Kastak *et al.*, 2008), there are no empirical data measuring PTS in marine mammals largely due to the fact that, for various ethical reasons, experiments involving anthropogenic noise exposure at levels inducing PTS are not typically pursued or authorized (NMFS, 2018).

Temporary Threshold Shift (TTS)—TTS is a temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018). Based on data from cetacean TTS measurements (Southall *et al.*, 2007, 2019), a TTS of 6 dB is considered the minimum Threshold Shift (TS) clearly larger than any day-to-day or session-to-session variation in a subject's normal hearing ability (Schlundt *et al.*, 2000; Finneran *et al.*, 2000, 2002). As described in Finneran (2015), marine mammal studies have shown the amount of TTS increases with cumulative sound exposure level (SELcum) in an accelerating fashion: At low exposures with lower SELcum, the amount of TTS is typically small and the growth curves have shallow slopes. At exposures with higher SELcum, the growth curves become steeper and approach linear relationships with the noise SEL.

Depending on the degree (elevation of threshold in dB), duration (*i.e.*, recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious (similar to those discussed in auditory masking, below). For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animal is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present.

Alternatively, a larger amount and longer duration of TTS sustained during a time when communication is critical for successful mother/calf interactions could have more serious impacts. We note that reduced hearing sensitivity as a simple function of aging has been observed in marine mammals, as well as humans and other taxa (Southall *et al.*, 2007), so we can infer that strategies exist for coping with this condition to some degree, though likely not without cost.

Many studies have examined noise-induced hearing loss in marine mammals (see Finneran (2015) and Southall *et al.* (2019) for summaries). TTS is the mildest form of hearing impairment that can occur during exposure to sound (Kryter, 2013). While experiencing TTS, the hearing threshold rises, and a sound must be at a higher level in order to be heard. In terrestrial and marine mammals, TTS can last from minutes or hours to days (in cases of strong TTS). In many cases, hearing sensitivity recovers rapidly after exposure to the sound ends. For pinnipeds in water, measurements of TTS are limited to harbor seals, elephant seals (*Mirounga angustirostris*), bearded seals (*Erignathus barbatus*) and California sea lions (Kastak *et al.*, 1999, 2007; Kastelein *et al.*, 2019b, 2019c, 2021, 2022a, 2022b; Reichmuth *et al.*, 2019; Sills *et al.*, 2020). These studies examined hearing thresholds measured in marine mammals before and after exposure to intense or long-duration sound exposures. The difference between the pre-exposure and post-exposure thresholds can be used to determine the amount of TS at various post-exposure times.

The amount and onset of TTS depends on the exposure frequency. Sounds at low frequencies, well below the region of best sensitivity for a species or hearing group, are less hazardous than those at higher frequencies, near the region of best sensitivity (Finneran and Schlundt, 2013). At low frequencies, onset-TTS exposure levels are higher compared to those in the region of best sensitivity (*i.e.*, a low frequency noise would need to be louder to cause TTS onset when TTS exposure level is higher), as shown for harbor

porpoises and harbor seals (Kastelein *et al.*, 2019a, 2019c). Note that in general, harbor seals have a lower TTS onset than other measured pinniped species (Finneran, 2015). In addition, TTS can accumulate across multiple exposures, but the resulting TTS will be less than the TTS from a single, continuous exposure with the same SEL (Mooney *et al.*, 2009; Finneran *et al.*, 2010; Kastelein *et al.*, 2014, 2015). This means that TTS predictions based on the total, SELcum will overestimate the amount of TTS from intermittent exposures, such as sonars and impulsive sources. Nachtigall *et al.* (2018) describes measurements of hearing sensitivity of multiple odontocete species (*i.e.*, bottlenose dolphin, harbor porpoise, beluga, and false killer whale (*Pseudorca crassidens*)) when a relatively loud sound was preceded by a warning sound. These captive animals were shown to reduce hearing sensitivity when warned of an impending intense sound. Based on these experimental observations of captive animals, the authors suggest that wild animals may dampen their hearing during prolonged exposures or if conditioned to anticipate intense sounds. Another study showed that echolocating animals (including odontocetes) might have anatomical specializations that might allow for conditioned hearing reduction and filtering of low-frequency ambient noise, including increased stiffness and control of middle ear structures and placement of inner ear structures (Ketten *et al.*, 2021). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species.

Relationships between TTS and PTS thresholds have not been studied in marine mammals, but such relationships are assumed to be similar to those in humans and other terrestrial mammals. PTS typically occurs at exposure levels at least several dBs above that inducing mild TTS (*e.g.*, a 40-dB TS approximates PTS onset (Kryter *et al.*, 1966; Miller, 1974), while a 6-dB TS approximates TTS onset (Southall *et al.*, 2007, 2019). Based on data from terrestrial mammals, a precautionary assumption is that the PTS thresholds for impulsive sounds (such as impact pile driving pulses as received close to

the source) are at least 6 dB higher than the TTS threshold on a peak-pressure basis and PTS SELcum thresholds are 15 to 20 dB higher than TTS SELcum thresholds (Southall *et al.*, 2007, 2019). Given the higher level of sound or longer exposure duration necessary to cause PTS as compared with TTS, it is considerably less likely that PTS could occur.

Pile dike repairs for the MSRI and CI Projects would require impact pile driving and vibratory pile driving and removal. Construction activities for each project would occur independently under separate authorizations. For each project, only one method of pile installation or removal would occur at a time, although multiple pile driving methods may be used on the same day. Pile driving associated with each project is not expected to be constant and pauses in the activities producing sounds are likely. Given these pauses and that many marine mammals would be transiting through the project areas and not remaining for extended periods of time, the potential for TS declines. For California sea lions, Steller sea lions, and harbor seals, animals are expected to remain in the CI project area, particularly around haulout site 24, which is a sand bar where the Cowlitz River and Carrols Channel meet with the mainstem Columbia River. California sea lions and Steller sea lions could also remain near the CI Project area as they transit to and from haulout site 24, and other structures near the Rainier, Oregon waterfront. Animals swimming with heads underwater would be exposed to pile driving noise throughout a day on multiple days, increasing risk of TS. However, we also expect these individuals to remain out of the water on haulouts for extended durations which reduces risk of TS.

Behavioral Harassment—Exposure to noise from pile driving and removal also have the potential to behaviorally disturb marine mammals. Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal. If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be

significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g.*, Lusseau and Bejder, 2007; Weilgart, 2007; NRC, 2005).

Disturbance may result in changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located. Pinnipeds may increase their haul out time, possibly to avoid in-water disturbance (Thorson and Reyff, 2006). Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.*, species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors (*e.g.*, Richardson *et al.*, 1995; Wartzok *et al.*, 2004; Southall *et al.*, 2007, 2021; Weilgart, 2007; Archer *et al.*, 2010). Behavioral reactions can vary not only among individuals but also within exposures of an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.*, 2012, Southall *et al.*, 2021), and can vary depending on characteristics associated with the sound source (*e.g.*, whether it is moving or stationary, number of sources, distance from the source). In general, pinnipeds seem more tolerant of, or at least habituate more quickly too, potentially disturbing underwater sound than do cetaceans, and generally seem to be less responsive to exposure to industrial sound than most cetaceans. For a review of the studies involving marine mammal behavioral responses to sound, see Southall *et al.*, 2007; Gomez *et al.*, 2016; and Southall *et al.*, 2021 reviews.

Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging

areas, the appearance of secondary indicators (*e.g.*, bubble nets or sediment plumes), or changes in dive behavior. As for other types of behavioral response, the frequency, duration, and temporal pattern of signal presentation, as well as differences in species sensitivity, are likely contributing factors to differences in response in any given circumstance (*e.g.*, Croll *et al.*, 2001; Nowacek *et al.*, 2004; Madsen *et al.*, 2006; Yazvenko *et al.*, 2007). A determination of whether foraging disruptions incur fitness consequences would require information on estimates of the energetic requirements of the affected individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal.

Airborne Acoustic Effects—Pinnipeds that occur near the project sites could be exposed to airborne sounds associated with pile driving and removal that have the potential to cause behavioral harassment, depending on their distance from the activities. Cetaceans are not expected to be exposed to airborne sounds that would result in harassment as defined under the MMPA.

Airborne noise would primarily be an issue for pinnipeds that are swimming or hauled out near the project sites within the range of noise levels elevated above the airborne acoustic harassment criteria. We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when swimming with their heads above water. Most likely, airborne sounds would cause behavioral responses similar to those discussed above in relation to underwater sound. For instance, anthropogenic sound could cause hauled-out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon the area and move further from the source. However, these animals would previously have been `taken' because of exposure to underwater sound above the behavioral harassment thresholds, which are in all cases larger than those associated with airborne sound. Thus, the behavioral harassment of these animals is already accounted for in these estimates of

potential take. Therefore, we do not believe that authorization of incidental take resulting from airborne sound for pinnipeds is warranted, and airborne sound is not discussed further here.

Stress Response—An animal's perception of a threat may be sufficient to trigger stress responses consisting of some combination of behavioral responses, autonomic nervous system responses, neuroendocrine responses, or immune responses (*e.g.*, Seyle, 1950; Moberg, 2000). In many cases, an animal's first and sometimes most economical (in terms of energetic costs) response is behavioral avoidance of the potential stressor. Autonomic nervous system responses to stress typically involve changes in heart rate, blood pressure, and gastrointestinal activity. These responses have a relatively short duration and may or may not have a significant long-term effect on an animal's fitness.

Neuroendocrine stress responses often involve the hypothalamus-pituitary-adrenal system. Virtually all neuroendocrine functions that are affected by stress—including immune competence, reproduction, metabolism, and behavior—are regulated by pituitary hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction, altered metabolism, reduced immune competence, and behavioral disturbance (*e.g.*, Moberg, 1987; Blecha, 2000). Increases in the circulation of glucocorticoids are also equated with stress (Romano *et al.*, 2004).

The primary distinction between stress (which is adaptive and does not normally place an animal at risk) and "distress" is the cost of the response. During a stress response, an animal uses glycogen stores that can be quickly replenished once the stress is alleviated. In such circumstances, the cost of the stress response would not pose serious fitness consequences. However, when an animal does not have sufficient energy reserves to satisfy the energetic costs of a stress response, energy resources must be diverted from other functions. This state of distress will last until the animal replenishes its energetic reserves sufficient to restore normal function.

Relationships between these physiological mechanisms, animal behavior, and the costs of stress responses are well-studied through controlled experiments and for both laboratory and free-ranging animals (*e.g.*, Holberton *et al.*, 1996; Hood *et al.*, 1998; Jessop *et al.*, 2003; Krausman *et al.*, 2004; Lankford *et al.*, 2005). Stress responses due to exposure to anthropogenic sounds or other stressors and their effects on marine mammals have also been reviewed (Fair and Becker, 2000; Romano *et al.*, 2002b) and, more rarely, studied in wild populations (*e.g.*, Romano *et al.*, 2002a). For example, Rolland *et al.* (2012) found that noise reduction from reduced ship traffic in the Bay of Fundy was associated with decreased stress in North Atlantic right whales. These and other studies lead to a reasonable expectation that some marine mammals will experience physiological stress responses upon exposure to acoustic stressors and that it is possible that some of these would be classified as "distress." In addition, any animal experiencing TTS would likely also experience stress responses (NRC, 2005), however distress is an unlikely result of these projects based on observations of marine mammals during previous, similar construction projects in the LCR.

Auditory Masking—Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.*, those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.*, 1995; Erbe *et al.*, 2016). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity and may occur whether the sound is natural (*e.g.*, snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.*, shipping, sonar, seismic exploration, pile driving) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.*, signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.*, sensitivity,

frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions. Masking of natural sounds can result when human activities produce high levels of background sound at frequencies important to marine mammals. Conversely, if the background level of underwater sound is high (*e.g.*, on a day with strong wind and high waves), an anthropogenic sound source would not be detectable as far away as would be possible under quieter conditions and would itself be masked.

Under certain circumstances, marine mammals experiencing significant masking could also be impaired from maximizing their performance fitness in survival and reproduction. Therefore, when the coincident (masking) sound is man-made, it may be considered harassment when disrupting or altering critical behaviors. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without resulting in TS) is not associated with abnormal physiological function, it is not considered a physiological effect, but rather a potential behavioral effect.

The frequency range of the potentially masking sound is important in determining any potential behavioral impacts. For example, low-frequency signals may have less effect on high-frequency echolocation sounds produced by odontocetes but are more likely to affect detection of mysticete communication calls and other potentially important natural sounds such as those produced by surf and some prey species. The masking of communication signals by anthropogenic noise may be considered as a reduction in the communication space of animals (*e.g.*, Clark *et al.*, 2009) and may result in energetic or other costs as animals change their vocalization behavior (*e.g.*, Miller *et al.*, 2000; Foote *et al.*, 2004; Parks *et al.*, 2007; Di Iorio and Clark, 2009; Holt *et al.*, 2009). Masking can be reduced in situations where the signal and noise come from different directions (Richardson *et al.*, 1995), through amplitude modulation of the signal,

or through other compensatory behaviors (Houser and Moore, 2014). Masking can be tested directly in captive species (*e.g.*, Erbe, 2008), but in wild populations it must be either modeled or inferred from evidence of masking compensation. There are few studies addressing real-world masking sounds likely to be experienced by marine mammals in the wild (*e.g.*, Branstetter *et al.*, 2013).

Masking affects both senders and receivers of acoustic signals and can potentially have long-term chronic effects on marine mammals at the population level as well as at the individual level. Low-frequency ambient sound levels have increased by as much as 20 dB (more than three times in terms of SPL) in the world's ocean from pre-industrial periods, with most of the increase from distant commercial shipping (Hildebrand, 2009). All anthropogenic sound sources, but especially chronic and lower-frequency signals (*e.g.*, from vessel traffic), contribute to elevated ambient sound levels, thus intensifying masking. The MSRI and CI Projects are located in areas with routine vessel traffic from recreational and commercial vessels; therefore, background sound levels are generally already elevated.

Marine Mammal Habitat Effects

Proposed construction for the MSRI and CI Projects could have localized, temporary impacts on marine mammal habitat, including prey, by increasing in-water SPLs and slightly decreasing water quality. Increased noise levels may affect acoustic habitat (see Auditory Masking) and adversely affect marine mammal prey in the vicinity of the project area (see discussion below). During impact and vibratory pile driving or removal, elevated levels of underwater noise would ensonify the project areas where both fish and mammals occur and could affect foraging success. Additionally, marine mammals may avoid the areas during construction; however, displacement due to noise is expected to be temporary and is not expected to result in long-term effects to the individuals or populations. Each project would be relatively short in duration and would

likely only have temporary impacts on marine mammal habitat through increases in underwater and airborne sound.

Water Quality—In-water pile driving activities would also cause short-term effects on water quality due to increased turbidity. Temporary and localized increase in turbidity near the riverbed would occur in the immediate area surrounding where piles are installed or removed and where rock placement occurs due benthic sediment disturbance. In general, turbidity associated with pile installation is localized to about a 25 ft (7.6 m) radius around the pile (Everitt *et al.*, 1980). The sediments of the project sites would settle out of the water column rapidly when disturbed. Local currents and tides are anticipated to disburse any additional suspended sediments produced by each of the project's activities at moderate to rapid rates depending on river current or tidal stage. Studies of the effects of turbid water on fish (marine mammal prey) suggest that concentrations of suspended sediment can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton, 1993).

Effects from turbidity and sedimentation are expected to be short-term, minor, and localized. Suspended solids in the water column should dissipate and quickly return to background levels in all construction scenarios. Turbidity within the water column has the potential to reduce the level of oxygen in the water and irritate the gills of prey fish species in each of the proposed project's areas. However, suspended sediment associated with the project would be temporary and localized, and fish in the proposed project area would be able to move away from and avoid the areas where plumes may occur. Therefore, it is expected that the impacts on prey fish species from turbidity, and therefore on marine mammals, would be minimal and temporary. In general, the areas likely impacted by the proposed construction activities are relatively small compared to the total available marine mammal habitat in the LCR in Oregon and Washington.

Therefore, we expect the impact from increased turbidity levels to be discountable to marine mammals and do not discuss it further.

In-water Effects on Potential Foraging Habitat—The proposed activities would not result in permanent impacts to habitats used directly by marine mammals and only negligible increases in vessel traffic are expected in either location as a result of the specified activities. The areas likely impacted by the proposed actions are relatively small compared to the total available habitat in the LCR in Oregon and Washington. Each of the proposed project areas are highly influenced by anthropogenic activities and provide limited foraging habitat for marine mammals. The total riverbed area affected by pile driving and rock placement activities is small compared to the vast foraging areas available to marine mammals both upstream and downstream the construction sites in the LCR. At best, the area impacted provide marginal foraging habitat for marine mammals and fishes. Furthermore, pile driving, pile removal and rock placement would not obstruct movements or migration of marine mammals.

Construction activities would produce continuous, non-impulsive (*i.e.*, vibratory pile driving and removal) and intermittent impulsive (*i.e.*, impact pile driving) sounds. Fish utilize the soundscape and components of sound in their environment to perform important functions such as foraging, predator avoidance, mating, and spawning (Zelick *et al.*, 1999; Fay, 2009). Depending on their hearing anatomy and peripheral sensory structures, which vary among species, fishes hear sounds using pressure and particle motion sensitivity capabilities and detect the motion of surrounding water (Fay *et al.*, 2008). The potential effects of noise on fishes depends on the overlapping frequency range, distance from the sound source, water depth of exposure, and species-specific hearing sensitivity, anatomy, and physiology. Key impacts to fishes may include behavioral responses, hearing damage, barotrauma (pressure-related injuries), and mortality.

Fish react to sounds which are especially strong and/or intermittent low-frequency sounds, and behavioral responses such as flight or avoidance are the most likely effects. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. The reaction of fish to noise depends on the physiological state of the fish, past exposures, motivation (*e.g.*, feeding, spawning, migration), and other environmental factors. Hastings and Popper (2005) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving on fish, several of which are based on studies in support of large, multi-year bridge construction projects (*e.g.*, Scholik and Yan, 2001; Popper and Hastings, 2009). Many studies have demonstrated that impulse sounds might affect the distribution and behavior of some fishes, potentially impacting foraging opportunities or increasing energetic costs (*e.g.*, Pearson *et al.*, 1992; Skalski *et al.*, 1992; Santulli *et al.*, 1999; Fewtrell and McCauley, 2012; Paxton *et al.*, 2017). In response to pile driving, Pacific sardines (*Sardinops sagax*) and northern anchovies (*Engraulis mordax*) may exhibit an immediate startle response to individual strikes but return to "normal" pre-strike behavior following the conclusion of pile driving with no evidence of injury as a result (see NAVFAC, 2014). However, some studies have shown no or slight reaction to impulse sounds (*e.g.*, Wardle *et al.*, 2001; Popper *et al.*, 2005; Jorgenson and Gyselman, 2009; Peña *et al.*, 2013).

SPLs of sufficient strength have been known to cause injury to fish and fish mortality. However, in most fish species, hair cells in the ear continuously regenerate and loss of auditory function is likely restored when damaged cells are replaced with new cells. Halvorsen *et al.* (2012b) showed that a TTS of 4-6 dB was recoverable within 24 hours for one species. Impacts would be most severe when the individual fish is close to the source and when the duration of exposure is long. Injury caused by barotrauma can range from slight to severe and can cause death and is most likely for fish with swim

bladders. Barotrauma injuries have been documented during controlled exposure to impact pile driving (Halvorsen *et al.*, 2012a; Casper *et al.*, 2013) and the greatest potential effect on fish during the proposed project would occur during impact pile driving. Impact pile driving for each of the proposed USACE construction projects would constitute a small proportion of total in-water construction time. For the MSRI Project, impact driving would be limited to 6 minutes per pile; consequently, installing all eight piles in a single day would result in a maximum of 48 minutes of impact noise. Similarly, the CI Project would require only 4.5 minutes of impact driving per pile, resulting in a total daily duration of just 36 minutes if eight piles are installed. In-water construction would be restricted to daylight hours (defined as 30 minutes before sunrise to 30 minutes after sunset) which would allow fish to forage and transit the area undisturbed at night. While vibratory pile driving may elicit temporary behavioral avoidance, it is unlikely to cause injury or have persistent effects on local populations. Furthermore, all installation would occur within USACE and USFWS-designated work windows from November 1, 2026, through February 28, 2027, to minimize exposure for migrating ESA-listed fish species. Notably, the MSRI and CI Project areas already experience significant anthropogenic noise from regular vessel traffic, with the CI Project area subject to additional noise from industrial activities.

The most likely impact to fishes from impact and vibratory pile driving and removal in project areas would be temporary behavioral avoidance of the area. The duration of fish avoidance of the area after pile driving stops is unknown but a rapid return to normal recruitment, distribution, and behavior is anticipated. There are times of known seasonal marine mammal foraging when fish are aggregating but the impacted areas are small portions of the total foraging habitats available in the LCR. In general, impacts to marine mammal prey species are expected to be minor and temporary. Further, it is anticipated that preparation activities for pile driving (*i.e.*, positioning of the pile or

hammer) and upon initial startup of devices would cause fish to move away from the affected area where injuries may occur. Therefore, relatively small portions of the proposed project area would be affected for short periods of time, and the potential for effects on fish to occur would be temporary and limited to the duration of sound-generating activities.

Construction activities, in the form of increased turbidity, also have the potential to adversely affect forage fish in the project area. As discussed earlier, increased turbidity is expected to occur in the immediate vicinity (approximately 25 ft (7.6 m) or less) of construction activities (Everitt *et al.*, 1980). However, suspended solids are expected to dissipate quickly within a single tidal cycle. Given the limited area affected and high tidal dilution rates, any effects on forage fish are expected to be minor or negligible. In addition, best management practices would be in effect to limit the extent of turbidity to the immediate project areas. Finally, turbidity levels resulting from construction activities are expected to remain within the range of baseline conditions. Fish and marine mammals in these regions are frequently exposed to significant suspended sediment loads from winter storm runoff, as well as other natural and anthropogenic sources.

In summary, given the short daily duration of sound associated with pile driving and removal the relatively small areas being affected, pile driving and removal activities associated with the proposed projects are not likely to have a permanent adverse effect on any fish habitat, or populations of fish species. Thus, we conclude that impacts of the specified activity are not likely to have more than short-term adverse effects on any prey habitat or populations of prey species. Further, any impacts to marine mammal habitat are not expected to result in significant or long-term consequences for individual marine mammals, or to contribute to adverse impacts on their populations.

Estimated Take of Marine Mammals

This section provides an estimate of the number of incidental takes proposed for authorization through the IHAs, which will inform NMFS' consideration of "small numbers," the negligible impact determinations, and impacts on subsistence uses.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would primarily be by Level B harassment (in the form of behavioral disturbance and temporary threshold shift (TTS)), as use of the acoustic sources (*i.e.*, vibratory, and impact pile driving; and vibratory pile removal) has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment), primarily affecting harbor seals, Steller sea lions, and California sea lions because of their prevalence in project areas, nearby haulouts, and predicted AUD INJ zones are relatively larger than for other hearing groups. The proposed mitigation and monitoring measures are expected to minimize the severity of the taking to the extent practicable.

As described previously, no serious injury or mortality is anticipated or proposed to be authorized for this activity. Below we describe how the proposed take numbers are estimated.

For acoustic impacts, generally speaking, we estimate take by considering: (1) acoustic criteria above which NMFS believes there is some reasonable potential for marine mammals to be behaviorally harassed or incur some degree of hearing

impairment; (2) the area or volume of water that would be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) the number of days of activities. We note that while these factors can contribute to a basic calculation to provide an initial prediction of potential takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.*, previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the proposed take estimates.

Acoustic Criteria

NMFS recommends the use of acoustic criteria that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur AUD INJ of some degree (equated to Level A harassment). Criteria for AUD INJ, and hearing group categories are available in NMFS' Updated Technical Guidance (NMFS 2024) and are reflected below in the Level A harassment section.

Level B Harassment – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source or exposure context (*e.g.*, frequency, predictability, duty cycle, duration of the exposure, signal-to-noise ratio, distance to the source), the environment (*e.g.*, bathymetry, other noises in the area, predators in the area), and the receiving animals (hearing, motivation, experience, demography, life stage, depth) and can be difficult to predict (*e.g.*, Southall *et al.*, 2007; Southall *et al.*, 2021; Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a metric that is both predictable and measurable for most activities, NMFS typically uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS generally predicts that marine mammals are likely to be behaviorally harassed in a manner considered to be Level B

harassment when exposed to underwater anthropogenic noise above root-mean-squared pressure received levels (RMS SPL) of 120 dB (referenced to 1 micropascal (re 1 μPa)) for continuous (*e.g.,* vibratory pile driving, drilling) and above RMS SPL 160 dB re 1 μPa for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources. Generally speaking, Level B harassment take estimates based on these behavioral harassment thresholds are expected to include any likely takes by TTS as, in most cases, the likelihood of TTS occurs at distances from the source less than those at which behavioral harassment is likely. TTS of a sufficient degree can manifest as behavioral harassment, as reduced hearing sensitivity and the potential reduced opportunities to detect important signals (conspecific communication, predators, prey) may result in changes in behavior patterns that would not otherwise occur.

The USACE's proposed activities include the use of continuous (vibratory hammer) and impulsive (impact hammer) sources, and therefore the RMS SPL thresholds of 120 and 160 dB re 1 μPa are applicable.

Level A harassment – NMFS' Updated Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0) (Updated Technical Guidance, 2024) identifies dual criteria to assess AUD INJ (Level A harassment) to five different underwater marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). The USACEs' proposed activities include the use of impulsive (impact hammer) and non-impulsive (vibratory hammer) sources.

The 2024 Updated Technical Guidance criteria include both updated thresholds and updated weighting functions for each hearing group. The thresholds are provided in table 5 below. The references, analysis, and methodology used in the development of the criteria are described in NMFS' 2024 Updated Technical Guidance, which may be

accessed at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance-other-acoustic-tools*.

Table 5 -- Thresholds Identifying the Onset of Auditory Injury

	AUD INJ Onset Acoustic Thresholds* (Received Level)	
Hearing Group	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{pk,flat}$: 222 dB $L_{E,\ LF,24h}$: 183 dB	*Cell 2* $L_{E,\ LF,24h}$: 197 dB
High-Frequency (HF) Cetaceans	*Cell 3* $L_{pk,flat}$: 230 dB $L_{E,HF,24h}$: 193 dB	*Cell 4* $L_{E,\ HF,24h}$: 201 dB
Very High-Frequency (VHF) Cetaceans	*Cell 5* $L_{pk,flat}$: 202 dB $L_{E,VHF,24h}$: 159 dB	*Cell 6* $L_{E,VHF,24h}$: 181 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{pk,flat}$: 223 dB $L_{E,PW,24h}$: 183 dB	*Cell 8* $L_{E,PW,24h}$: 195 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{pk,flat}$: 230 dB $L_{E,OW,24h}$: 185 dB	*Cell 10* $L_{E,OW,24h}$: 199 dB

* Dual metric criteria for impulsive sounds: Use whichever criteria results in the larger isopleth for calculating AUD INJ onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level criteria associated with impulsive sounds, the PK SPL criteria are recommended for consideration for non-impulsive sources.

Note: Peak sound pressure level ($L_{p,0\text{-}pk}$) has a reference value of 1 µPa, and weighted cumulative sound exposure level ($L_{E,p}$) has a reference value of 1 µPa^{2}s. In this table, criteria are abbreviated to be more reflective of International Organization for Standardization standards (ISO, 2017). The subscript "flat" is being included to indicate peak sound pressure are flat weighted or unweighted within the generalized hearing range of marine mammals underwater (*i.e.*, 7 hertz (Hz) to 165 kHz). The subscript associated with cumulative sound exposure level criteria indicates the designated marine mammal auditory weighting function (LF, HF, and VHF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The weighted cumulative sound exposure level criteria could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these criteria will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that are used in estimating the area ensonified above the acoustic thresholds, including source levels and transmission loss coefficient.

In order to calculate distances to the Level A and Level B harassment thresholds for the methods and piles being used in these projects, NMFS used proxy source levels for the piles that were identified from the literature. Vibratory and impact pile driving of steel pipe, timber, and steel sheet piles for the MSRI and CI Projects were based on the

summary of data for each pile material and type provided by Caltrans (2020, 2015). Table 6 shows the source levels used for calculating harassment zones for impact driving as well as vibratory pile driving and removal for the MSRI and CI Projects. The source levels used were the most suitable due to similar pile sizes, pile driving, and pile removal methods.

Table 6 -- Estimated Unattenuated Underwater Sound Pressure Level Associated with Vibratory and Impact Pile Driving for the CI Project

Pile Type	Method	Source for Proxy Values used	SPLs or SEL at 10 meters distance		
			Average Peak SPL, dB re 1 µPa	Average RMS SPL, dB re 1 µPa	Average SEL, dB re 1 µPa2-sec
MSRI Project					
24-inch Steel pipe	Vibratory Installation	Caltrans (2020)	194	157	NA
24-inch Steel pipe	Impact installation	Caltrans (2015)	203	190	177
CI Project					
10-12-inch Steel pipe	Vibratory Installation	Caltrans (2015)	171	155	NA
10-12-inch steel pipe	Impact Installation	Caltrans (2015, 2020)	192	177	167
16-inch Steel pipe	Vibratory Installation	Caltrans (2020)	196	158	NA
16-inch Steel pipe	Impact Installation	Caltrans (2020)	200	185	175
20-24-inch Steel pipe	Impact Installation	Caltrans (2015)	203	190	177
24-inch Steel pipe	Vibratory Installation	Caltrans (2020)	194	157	NA
24-inch AZ Steel sheet	Vibratory Installation and Removal	Caltrans (2020)	175	160	NA
12-16-inch Timber	Vibratory Installation	Caltrans (2020)	NA	162	NA
12-14-inch Timber	Impact installation	Caltrans (2020)	180	170	160

SPL = Sound Pressure Levels; SEL = Sound Exposure Level; RMS = root mean square; dB re 1 µPa = decibels referenced to 1 micropascal; dB re 1 µPa2 -sec = decibels referenced to 1 micropascal squared second; NA = not applicable. All SPLs and SELs are unattenuated.

Level B Harassment Zones

Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source until the source becomes indistinguishable from ambient sound. TL parameters vary with frequency, temperature, river conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

TL = B * Log10 (R1/R2)

Where:

TL = transmission loss in dB

B = transmission loss coefficient; for practical spreading equals 15

R1 = the distance of the modeled SPL from the driven pile, and

R2 = the distance from the driven pile of the initial measurement

The recommended TL coefficient for most nearshore environments is the practical spreading value of 15. This value results in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions, which is the most appropriate assumption for the USACE's proposed activities in the absence of specific modeling. The spreadsheet inputs for pile size, type, and installation method for each project are included in tables 7 and 8. The estimated Level B harassment zones for USACE's proposed activities are shown in tables 9 and 10 for the MSRI and CI Projects, respectively.

Level A harassment Zones

The ensonified area associated with Level A harassment is more technically challenging to predict due to the need to account for a duration component. Therefore, NMFS developed an optional User Spreadsheet tool to accompany the 2024 Updated Technical Guidance that can be used to relatively simply predict an isopleth distance for use in conjunction with marine mammal density or occurrence to help predict potential takes. We note that because of some of the assumptions included in the methods underlying this optional tool, we anticipate that the resulting isopleth estimates are typically going to be overestimates of some degree, which may result in an overestimate of potential take by Level A harassment. However, this optional tool offers the best way to estimate isopleth distances when more sophisticated modeling methods are not available or practical. For stationary sources such as impact and vibratory driving, the

optional User Spreadsheet tool predicts the distance at which, if a marine mammal remained at that distance for the duration of the activity, it would be expected to incur AUD INJ. Inputs used in the optional User Spreadsheet tool, and the resulting estimated isopleths, are reported below.

Table 7 -- NMFS User Spreadsheet Inputs for the MSRI Project

Pile Size and material	Spreadsheet tab Used	Source level (SPL)	Weighting factor adjustment	Transmission loss coefficient	Activity duration (minutes), or (strikes/pile)	Number of piles per day	Distance of Sound pressure level Measurement(m)
Vibratory pile driving							
24-inch steel	A.1) Vibratory Pile Driving	157 dB RMS	2.5	15	12	8	10
Impact pile driving [a]							
24-inch steel	E.1) Impact Pile Driving	190 dB RMS, 177 dB SEL, 203 dB PK	2	15	(225)	8	10

[a] 5 dB of attenuation was applied to impact driving to account for noise reduction from bubble curtains

Table 8 -- NMFS User Spreadsheet Inputs for the CI Project

Pile Size and material	Spreadsheet tab used	Source level (SPL)	Weighting factor adjustment	Transmission loss coefficient	Activity duration (minutes) or (strikes/pile)	Number of piles per day	Distance of Sound pressure level Measurement(m)
Vibratory pile driving							
10.75-12-inch steel pipe	A.1) Vibratory Pile Driving	155 dB RMS	2.5	15	12	4	10
16-inch steel pipe		158 dB RMS	2.5	15	18	3	10
24-inch steel pipe (ATON)		157 dB RMS	2.5	15	12	1	10
12-inch timber pole		162 dB RMS	2.5	15	8	8	10
24-inch steel pipe (MOF)		157 dB RMS	2.5	15	12	8	10
24-inch Steel Sheet (MOF)		160 dB RMS	2.5	15	10	25	10
Vibratory pile removal							

24-inch steel pipe (MOF)	A.1) Vibratory Pile Driving	157 dB RMS	2.5	15	12	8	10
24-inch Steel Sheet (MOF)		160 dB RMS	2,5	15	3	200	10
Impact Pile driving [a]							
10.75-12-inch steel pipe	E.1) Impact Pile Driving	177 dB RMS, 167 dB SEL, 200 dB PK	2	15	(225)	4	10
16-inch steel pipe		185 dB RMS, 175 dB SEL, 200 dB PK	2	15	(225)	3	10
24-inch steel pipe (ATON)		190 dB RMS, 177 dB SEL, 203 dB PK	2	15	(225)	8	10
12-inch timber pole		170 dB RMS, 160 dB SEL, 180 dB PK	2	15	(225)	8	10

[a] 5 dB of attenuation was applied to impact driving to account for noise reduction from bubble curtains

Table 9 -- Projected Distances to Level A Harassment and Level B Harassment Isopleths (m) by Marine Mammal Hearing Groups for Vibratory and Impact Installation of Piles for the MSRI Project

Pile size and material	Level A Harassment Distance (m)					Level B Harassment Distance (m)
	LF cetaceans	HF cetaceans	VHF cetaceans	PW	OW	
Vibratory pile driving						
24-inch steel pipe	7	3	6	9	3	2,929
Impact pile driving [a]						
24-inch steel pipe	272	34	421	242	90	464

[a] 5 dB of attenuation was applied to impact driving to account for noise reduction from bubble curtains

Table 10 -- Projected Distances to Level A Harassment and Level B Harassment Isopleths (m) by Marine Mammal Hearing Groups for the Vibratory Installation or Removal and Impact Installation

Pile size and material	Level A Harassment Distance (m)					Level B Harassment Distance (m)
	LF Cetaceans	HF Cetaceans	VHF Cetaceans	PW	OW	

Vibratory pile driving						
10.75-12-inch steel pipe	3	1	3	4	2	2,154
16-inch steel pipe	4	2	3	5	2	3,415
24-inch steel pipe (ATON)	2	1	1	2	1	2,929
12-inch timber	15	6	12	19	6	6,310
24-inch steel pipe (MOF)[a]	7	3	6	9	3	2,929
24-inch Steel Sheet (MOF) [a]	21	8	19	17	26	4,642
Impact pile driving [b]						
10.75-12-inch steel pipe	37	5	57	33	12	63
16-inch steel pipe	104	13	161	93	35	215
24-inch steel pipe (ATON)	68	9	105	60	23	464
12-inch timber	20	3	31	18	7	22

[a] indicates piles would be installed and removed
[b] 5 dB of attenuation was applied to impact driving to account for noise reduction from bubble curtains

Marine Mammal Occurrence

In this section we provide information about the occurrence of marine mammals, including density or other relevant information which will inform the take calculations. For all species, the best available scientific data was considered to estimate occurrence for both proposed projects.

For the MSRI Project, incidental take is expected to occur for harbor seals, California lions, Steller sea lions and harbor porpoises. Occurrence of harbor porpoises for the MSRI Project was derived from a monitoring report for the USACE Sand Island Pile Dike Replacement Project, located at RM 4 in the LCR. During the 15 days of monitoring for that project, seven individual harbor porpoises were observed (Hammer Environmental L.P., 2020). Based on these observations, USACE estimates that two harbor porpoises may enter Level B Harassment zones during the 8 days of pile driving for the MRSI Project. NMFS concurs with this approach because although harbor porpoises are generally uncommon in project area, they could potentially occur.

Initially, USACE estimated harbor seal take based on densities derived from ODFW and WDFW surveys as well as personal communication with state biologists. Upon review, NMFS determined that the ODFW data for harbor seals and California sea

lions were either outside of the proposed project area or represented months of peak abundance for these species which do not align with the MSRI Project's in-water work window. Similarly, the initial California sea lion and Steller sea lion densities were based on a single count 40 RM upstream of the project site, which NMFS deemed unrepresentative of the MSRI Project area.

For the CI Project, incidental take is expected to occur for harbor seals, California sea lions, and Steller sea lions. Initially, USACE estimated harbor seal take based on the maximum number of animals observed on haulout sites 24 and 25 in 2000 (WDFW, 2000). NMFS determined these data were outdated, as they were over 26 years old. For California sea lions and Steller sea lions, USACE initially estimated take based on single count of animals at haulout sites 24 A, B, and C, as well as pinnipeds counts at Bonneville Dam, located 70 RM upstream (Edwards, personal communication, 2023, and Braun *et. al.*, 2024). NMFS does not agree with this approach because historical data, single counts, and data from Bonneville Dam is unlikely to accurately reflect current occurrence of pinnipeds at the CI Project area. Consequently, NMFS proposed, and USACE accepted, revised methodologies for estimating take for both the MSRI and CI Projects using more recent and geographically relevant data described below.

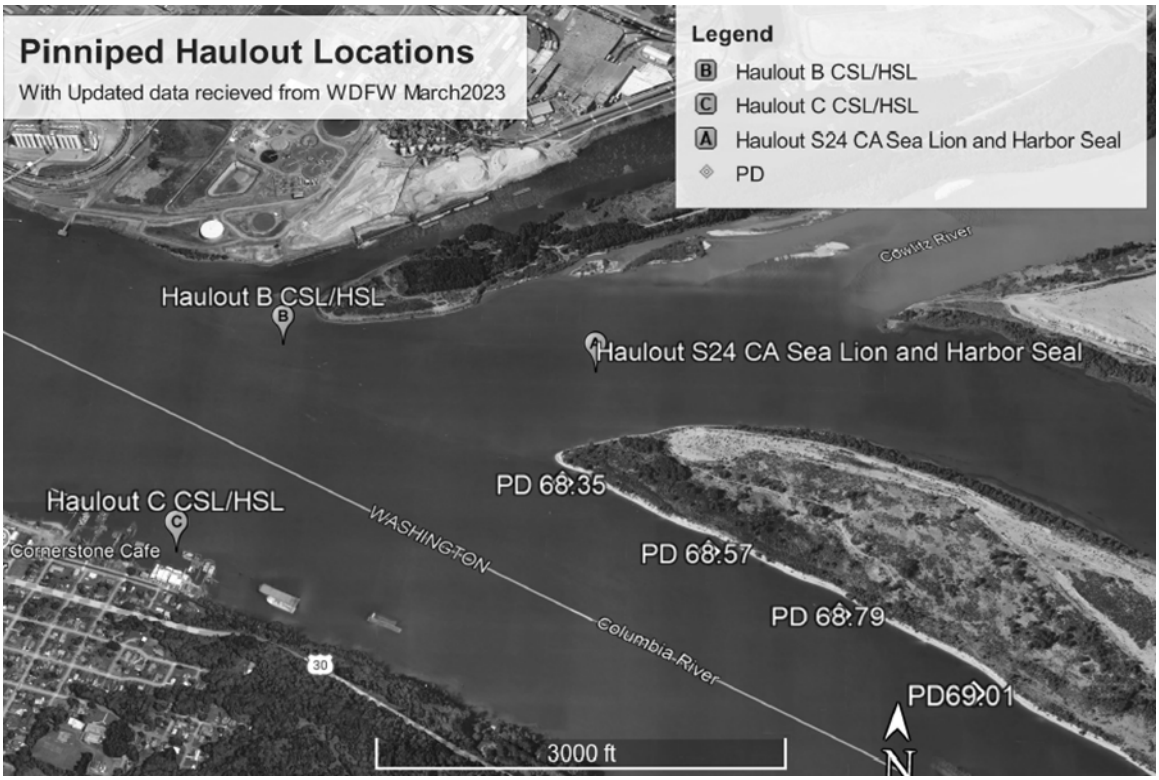

Figure 3 -- Pinniped Haulouts Near the CI Project Area

Previously, NMFS inquired about current marine mammal signings data from the ODFW in the WDFW in October 2024 for the Interstate Bridge Replacement Project (90 FR 40492, August 19, 2025). These agencies provided information about the relative use

of haulout areas and the seasonality of pinniped presence in the Columbia and Willamette Rivers. This data indicated that peak seasonal presence occurred between the months of February through May, though sea lions are often present at Bonneville Dam in other months.

In November 2024, NMFS received unpublished 2012-2020 pinniped abundance monitoring data for the LCR from ODFW in collaboration with the Columbia River Inter-Tribal Fish Commission (CRITFC), and ODFW pinniped monitoring data for 2021-2024 from haulout sites in Columbia, Willamette, and Kalama Rivers. CRITFC data were taken via boat-based surveys of known pinniped haulouts along the LCR and the ODFW monitoring data were taken via boat and aerial drone surveys in the Columbia, Willamette, and Kalama Rivers at known haulout sites (Brown, M., Personal communication, 2024). Each of these data sets presented pinnipeds as a guild, not separated by species.

NMFS analyzed CRITFC datasets for Zone 4 of the Columbia River Estuary, spanning from Astoria, Oregon river kilometer RM 12 to the upper end of the estuary RM 41. Although the MSRI Project is expected to occur between December and February, CRITFC data were only available from February through May. These data show a seasonal increase in pinniped abundance starting in February, with a wide range of annual variability. Given the project's brief 8-day duration, it is possible that all in-water work could be concentrated at the end of the work window when pinniped density is highest. To account for this and for the variability in pinniped sightings between years, NMFS utilized the monthly 75th percentile of February and March occurrence data pooled, which were used in take calculations and are presented in table 11. This methodology ensures that take of pinnipeds reflects this seasonal trend, specifically accounting for the higher abundance observed in late February when all construction for the MSRI Project could potentially occur.

Table 11 -- Pinniped Occurrence for the Columbia River between Astoria, OR and the Upper End of the Columbia River Estuary

Month	Monthly Average	Monthly 75th Percentile	Average for February and March	75th Percentile for February and March
February	10.5	14.3	70.5	79.2
March	85.5	89.3		

While the CI Project area (RM 68-72) falls within CRITFC Survey Zone 3, NMFS believes that the ODFW monitoring data from 2021 through 2024 provides a more scientifically precise representation of pinniped occurrence in the immediate vicinity (Brown, M., Personal communication, 2024). This dataset captures seasonal variation between January through May, showing an increase in occurrence that peaks between February and March. To ensure take estimates accurately reflect seasonal variability during the CI Project's November through December pile driving window, NNMFS condensed the monitoring data using the following approach:

- Averaging Methodology: Monthly counts were compiled to calculate monthly and 2-month pooled averages (*e.g.*, January/February, and February/March) to capture peak seasonal occurrence.
- November/December Proxy: Because specific monitoring data were unavailable for these months, the January monthly average was used as a surrogate.
- January Adjustment: The January/February pooled average was applied to January project activities to account for increasing seasonal occurrence.
- February Adjustment: The February/March pooled average was applied to February project activities to ensure estimates account for the late-season peak in occurrence.

The resulting values in table 12 were applied to the Level A formula for the CI Project below.

Table 12 -- Pinniped Occurrence for the Cowlitz/Rainier Haulouts Used in Take Estimation.

Construction Month	Guild Average	Observation Month(s) (moving average(s))
November	138	January (one-month)
December	138	January (one-month)
January	148	January and February (two-months)
February	298.15	February and March (two-months)

Take Estimation

Here we describe how the information provided above is synthesized to produce a quantitative estimate of the take that is reasonably likely to occur and proposed for authorization. Because recent monitoring data obtained from CRITFC, ODFW, and WDFW often do not differentiate between pinniped species, NMFS calculated occurrence rates for the three expected pinniped species as a combined guild.

The predicted isopleths in table 13 differ from those presented in the original applications because the application's Level A harassment isopleths were modeled without a bubble curtain. In this proposed authorization, NMFS applied a 5 dB noise attenuation factor to account for USACE's use of bubble curtains during impact pile driving.

Not all animals within the MSRI and CI Project areas are expected to be exposed to noise levels exceeding the threshold for Level A harassment. NMFS concurs with USACE's proposal to estimate Level A harassment based on the proportion of the largest pile-driving isopleth (impact or vibratory) for each pile size relative to the average river width at the construction site (Table 13).

Table 13 -- Proportion of exposure by activity for transiting pinnipeds, total days of pile installation, and average days of pile installation each month for the MSRI and CI Projects

Installation method [a]	Pile type	Predicted largest isopleth (m)	Average Channel Width (m)	Proportion of Channel width Ensonified	Total days of pile driving	Days of pile installation per month
MSRI Project						
Attenuated Impact Installation [b]	24-inch Steel Pipe	242	9,918	0.026	8	2
CI Project						
Unattenuated vibratory installation	12-inch timber piles	19	969	0.020	17	4.25

Attenuated impact installation [b]	10 to 12-inch steel pipe piles	33	811.4	0.041	11	2.75
Attenuated impact installation [b]	16-inch steel pipe piles	93	862	0.108	4	1
Attenuated impact installation [b]	24-inch steel pipe	60	762	0.079	2	0.5

[a] Only the largest harassment zone (impact or vibratory installation) per pile size was included because both methods would occur on the same day and take was calculated with the largest of the two zones
[b] 5 dB of attenuation was applied to impact driving to account for noise reduction from bubble curtains

MSRI Project: Take Calculation Methods

NMFS used the following formula to calculate take by Level A harassment for pinnipeds as a guild for the MSRI Project:

Level A harassment= (Largest predicted Level A harassment isopleth (m)/ Average river channel width (m)) x Total days of pile driving x 75th percentile of 2-month pinniped occurrence (February and March)

For the MSRI Project, the largest Level A harassment isopleth would occur during impact pile driving of 24-inch steel pipe piles. After applying the 5 dB attenuation for bubble curtain use, the largest Level A harassment isopleth for the pinniped guild is 242 m. Dividing this by the average channel width results in an isopleth ratio of 0.026 (table 13).

To calculate the take estimate, this ratio (0.026) was multiplied by the total duration of pile driving (8 days) and the 75th percentile of pinniped occurrence for February and March (79.6 animals per day) from CRITFC Zone 4 surveys. This results in a rounded estimate of 17 takes by Level A harassment. Accordingly, NMFS proposes to authorize 17 takes of pinnipeds by Level A harassment for the MSRI Project, presented as a guild (tables 14 and 15).

NMFS used the following formula to calculate take by Level B harassment for the MSRI Project:

Level B harassment = ((total days of pile driving x 75th percentile of 2-month pinniped occurrence (February and March)) – Calculated Level A harassment)

Take by Level B harassment was calculated by multiplying the 8 days of pile driving for 24-inch steel pipe piles by the 75th percentile of pooled March/February occurrence (79.6), equating to 634 total pinniped takes by Level B harassment. After subtracting the 17 takes by Level A harassment, the result is 617 estimated takes by Level B harassment. Thus, NMFS proposes to authorize 617 takes by Level B harassment of pinnipeds presented as a guild (tables 14 and 15).

Table 14 -- Estimated Take by Level A Harassment and Level B Harassment Proposed for Authorization for Pinnipeds as a Guild for the MSRI Project

Pile type (installation or removal method)	Estimated take November through December	Total
Level A harassment		
24-inch steel pipe (impact)	16.8	17
Level B harassment		Total Level B harassment – Level A harassment
24-inch steel pipe (impact)	633.6	617

Table 15 -- Proposed take of Marine Mammals by Level A and Level B Harassment and Percent of Each Stock Expected Take for the MSRI Project

Species	Stock	Proposed Take - MSRI Project		Percentage of Stock [a]
		Level A harassment	Level B harassment	
Harbor Porpoise	Northern OR/ WA Coast	0	2	<1
California Sea Lion	U.S.	17	617	<1
Steller Sea Lion	Eastern			1.7
Harbor Seal	OR/WA Coastal			2.8 [b]

[a] NMFS conservatively assumes that all proposed estimated takes could come from a single stock due to the inability to distinguish between species detected during surveys. In reality, takes would occur to all three stocks and the percentages shown are thus overestimates.
[b] The SAR lists the abundance for this stock as unknown; Pearson *et al.*, 2024 report an estimate of 22,549, which we used in this analysis.

CI Project: Take Calculation Methods

NMFS used the following formula to calculate take by Level A harassment per pile size/type for the CI project:

Level A harassment (per pile size/type) = (Largest predicted Level A harassment isopleth (m)/ Average river channel width (m)) x Average pile driving days per month x Monthly or pooled 2-month average pinniped occurrence

For all pile sizes, except 12-inch timber piles, the largest predicted Level A harassment isopleth occurs during impact pile driving. The average river channel width represents the mean of all pile installation locations (PDs) corresponding to each specific pile size and type. The average pile driving days is the total number of days per pile type divided by four, as the in-water work window spans 4 months (December through February) (table 13). USACE assumed that each pile type would be driven on separate days. Estimates for each pile size were summed to determine the total takes by Level A harassment for the CI Project (table 16).

NMFS used the following formula to calculate take by Level B harassment for the CI Project:

Level B harassment (per pile size/type) = (Average monthly pile driving days x Monthly or pooled 2-month average of pinniped occurrence) – Calculated take by Level A harassment

The total Level B harassment for the CI Project was calculated by summing the estimates for all pile sizes/types and then subtracting the total estimated takes by Level A harassment (table 16). Total takes proposed for authorization by Level A and Level B harassment are presented in table 17.

Table 16 -- Take by Level A and Level B Harassment of Pinnipeds as a Guild for Each Pile Size and Total Take for the CI Project

Pile type (installation or removal method)	November	December	January	February	Total (rounded)
Level A harassment					
Installation					
12-inch timber pole (vibratory)	11.5	11.5	12.3	24.8	247
10-12-inch steel pipe (impact)	15.4	15.4	16.6	33.3	
16-inch steel pipe (impact)	14.9	14.9	16	32.2	

24-inch steel pipe (impact)	5.4	5.4	5.8	11.7	
Level B harassment					
Installation					Total (rounded)
12-inch timber pole (vibratory)	586.5	586.5	629	1,267.1	11,578
10-12-inch steel pipe (impact)	379.5	379.5	407	819.9	
16-inch steel pipe (impact)	138	138	148	298.2	
24-inch steel pipe (impact)[a]	69	69	74	149.1	
24-inch steel pipe (vibratory)[b]	310.5	310.5	333	670.8	
24-inch steel sheet (vibratory)[b]	414	414	444	894.5	
Removal					
24-inch steel pipe (vibratory)[b]	310.5	310.5	333	670.8	
24-inch steel sheet (vibratory)[b]	51.75	51.75	55.5	111.8	

[a] Indicates permanent Aid to Navigation (ATON) piles
[b] Indicates temporary Material Offload Facility (MOF) pile

Table 17 -- Proposed take of Marine Mammals by Level A and Level B Harassment and Percent of Each Stock Expected Take for the CI Project

Species	Stock	Proposed Take		Percentage of Stock [a]
		Level A harassment	Level B harassment	
California Sea Lion	U.S.	247	11,758	4.6
Steller Sea Lion	Eastern			32.6
Harbor Seal [b]	OR/WA Coastal			52.44

[a] NMFS conservatively assumes that all proposed estimated takes could come from a single stock due to the inability to distinguish between species detected during surveys. In reality, takes would occur to all three stocks and likely to the same individuals over subsequent days, and the percentages shown are thus overestimates.
[b] The SAR lists the abundance for this stock as unknown; Pearson *et al.*, 2024 report an estimate of 22,549, which we used in this analysis.

Proposed Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other

means of effecting the least practicable adverse impact upon the affected species or stocks, and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, NMFS considers two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations.

The mitigation requirements described in the following were proposed by USACE in its adequate and complete applications or are the result of subsequent coordination between NMFS and USACE. USACE has agreed that all of the mitigation measures are practicable. NMFS has fully reviewed the specified activities and the mitigation measures to determine if the mitigation measures would result in the least practicable adverse impact on marine mammals and their habitat, as required by the MMPA, and has determined the proposed measures are appropriate. NMFS describes these below as proposed mitigation requirements and has included them in the proposed IHAs.

In addition to the measures described later in this section, the USACE would follow these general mitigation measures:

- Authorized take, by Level A and Level B harassment only, would be limited to the species and numbers listed in tables 15 and 17. Construction activities must be

halted upon observation of either a species for which incidental take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met, entering or is within the harassment zone.

- The taking by serious injury or death of any of the species listed in table 16 or any taking of any other species of marine mammal would be prohibited and would result in the modification, suspension, or revocation of the IHAs, if issued. Any taking exceeding the authorized amounts listed in tables 15 and 17 would be prohibited and would result in the modification, suspension, or revocation of the IHAs, if issued.
- Ensure that construction supervisors and crews, the marine mammal monitoring team, and relevant USACE staff are trained prior to the start of all construction activities, so that responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures are clearly understood. New personnel joining during the projects must be trained prior to commencing work;
- The USACE, construction supervisors and crews, protected species observers (PSOs), and relevant USACE staff must avoid direct physical interaction with marine mammals during construction activity. If a marine mammal comes within 10 meters of such activity, operations must cease and vessels must reduce speed to the minimum level required to maintain steerage and safe working conditions, as necessary to avoid direct physical interaction;
- Employ PSOs and establish monitoring locations as described in Section 5 of the IHAs and the USACE's Marine Mammal Monitoring and Mitigation Plans (see chapter 10 and chapter 13 of the USACE MSRI and CI Project applications, respectively). The USACE must monitor the project area to the maximum extent

possible based on the required number of PSOs, required monitoring locations, and environmental conditions.

Additionally, the following mitigation measures apply to the USACE's in-water construction activities at both the MSRI and CI project locations:

Establishment of Shutdown Zones

The USACE would establish shutdown zones with radial distances as identified in tables 18 and 19 for all construction activities. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). If a marine mammal enters or is observed within the shutdown zones indicated in tables 18 and 19, pile driving must be delayed or halted. Operations may only resume once the animal is visually confirmed outside the zone or 15 minutes have passed without a re-detection.

Construction supervisors and crews, PSOs, and relevant USACE staff must avoid direct physical interaction with marine mammals during construction activities. If marine mammals come within 10 m of such activity, operations must cease, to avoid direct interaction. If an activity is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually confirmed beyond the shutdown zone indicated in tables 18 and 19 or 15 minutes have passed without re-detection of the animal.

Finally, construction activities must be halted upon observation of a species for which incidental take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met entering or within any shutdown zone. If a marine mammal species not covered under these IHAs enters a shutdown zone, all in-water activities would cease until the animal leaves the zone or has not been observed for at least 15 minutes. Pile driving may proceed if the unauthorized

species is observed leaving the clearance and shutdown zone or if 15 minutes have passed since the last observation.

Table 18 -- Proposed Shutdown Zones During MSRI Project Activities

Pile type, size, and method or Activity	Shutdown Zone (m)		
	VHF cetaceans	PW	OW
24-inch Steel Pipe, Vibratory Installation	50		
24-inch Steel Pipe, Impact Installation			
Barge Movement and Rock or Pile Placement	10		

Table 19 -- Proposed Shutdown Zones During CI Project Activities

Pile type, size, and method or Activity	Shutdown Zones (m)	
	PW	OW
10-12, 16, and 24 Steel Pipe Piles, Impact Installation	60	
12 -inch Timber Pole Pile, Vibratory and Impact Installation	40	
10-12, 16, and 24-inch Steel Pipe Piles, and 24-inch Steel Sheet Piles, Vibratory Installation or Removal	20	
Terrestrial Work at PD 68.35	60	
Barge Movement and Rock or Pile Placement	10	

Pre- and Post-Activity Monitoring

Monitoring would take place before, during, and 30 minutes after any pile driving or pile removal activities (*i.e.*, pre-start clearance monitoring). In addition, monitoring for 30 minutes would take place whenever a break in the specified activity (*i.e.*, impact pile driving, vibratory pile driving) of 30 minutes or longer occurs. Pre-start clearance monitoring would be conducted during periods of visibility sufficient for the lead PSO to determine that the shutdown zones indicated in tables 18 and 19 are clear of marine mammals. Pile driving may commence following 30 minutes of observation when the determination is made that the shutdown zones are clear of marine mammals. If pile driving is delayed or halted due to the presence of a marine mammal, the activities would not commence or resume until either the animal has voluntarily left and been visually confirmed beyond the shutdown zones or 15 minutes have passed without re-detection of the animal.

Soft Start Procedures for Impact Driving

Soft-start procedures are used to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to

an impact hammer operating at full capacity. The USACE would use soft start techniques when impact pile driving. Soft start procedures require contractors to provide an initial set of three strikes at reduced energy, followed by a 30-second waiting period, then two subsequent reduced- energy strike sets. A soft start would be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of 30 minutes or longer.

Bubble Curtain

A bubble curtain would be employed during impact installation or proofing of timber or steel piles, unless the piles are driven in the dry, or water is less than 3 ft (0.9 m) in depth. A bubble curtain would not be required during vibratory pile driving. At minimum, the bubble curtain must distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column. The lowest bubble ring would be in contact with the substrate for the full circumference of the ring. The weights attached to the bottom ring would ensure 100 percent substrate contact. No parts of the ring or other objects would prevent full substrate contact. Air flow to the bubblers must be balanced around the circumference of the pile.

Based on our evaluation of the applicant's proposed measures, NMFS has preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance. NMFS conducted an independent evaluation of the proposed measures, and has preliminarily determined for each of the proposed IHAs that the proposed mitigation measures provide the means of effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Proposed Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present while conducting the activities. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the activity; or (4) biological or behavioral context of exposure *(e.g.*, age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;

- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and
- Mitigation and monitoring effectiveness.

The monitoring and reporting requirements described in the following were proposed by the USACE in its adequate and complete applications and/or are the result of subsequent coordination between NMFS and USACE. USACE has agreed to the requirements. NMFS describes these below as requirements and has included them in the proposed IHAs.

Visual Monitoring

All PSOs must be NMFS-approved and have no other assigned tasks during monitoring periods. At least one PSO would have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued ITA.

During all in-water work for both the MSRI and CI Projects, a minimum of two PSOs would monitor Level A and Level B harassment zones to the extent practicable to document the marine mammal's presence and behavior. PSOs would monitor for marine mammals 30 minutes before, during, and 30 minutes after the specified activities from the construction barge, on shore nearby, or from a vessel 200 to 300 m away. Additionally, observers would record all incidents of marine mammal occurrence, regardless of distance from activity, and would document any behavioral reactions in concert with distance from piles being driven or removed. Pile driving activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes.

PSOs should also have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols;

- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

Reporting

The USACE would be required to submit a draft report(s) on all construction activities and marine mammal monitoring results to NMFS within 90 days of the completion of monitoring, or 60 days prior to the requested issuance of any subsequent IHAs or similar activities at the same locations, whichever comes first. The information required to be collected and reported to NMFS is included in the draft IHA available at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities.* In summary, the reports would include, but not be limited to, information regarding activities that occurred, marine mammal sighting data, and whether mitigative actions were taken or could not be taken. The USACE would also be required to submit reports on any observed injured or dead marine mammals. If the death or injury was clearly caused by the specified activity, the USACE would immediately cease the specified activities until NMFS is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure

compliance with the terms of the IHA. The USACE would not resume its activities until notified by NMFS.

Specific proposed mitigation, monitoring, and reporting requirements can be found in the draft IHAs found at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities.*

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any impacts or responses (*e.g.*, intensity, duration), the context of any impacts or responses (*e.g.*, critical reproductive time or location, foraging impacts affecting energetics), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338, September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, the majority of our analysis applies to all the species listed in table 3, given that many of the anticipated effects of these two projects on different

marine mammal stocks are expected to be relatively similar in nature. There is little information about the nature or severity of the impacts, or the size, status, or structure of any of these species or stocks that would lead to a different analysis for this activity.

NMFS has identified key factors which may be employed to assess the level of analysis necessary to conclude whether potential impacts associated with a specified activity should be considered negligible. These include (but are not limited to) the type and magnitude of taking, the amount and importance of the available habitat for the species or stock that is affected, the duration of the anticipated effect to the species or stock, and the status of the species or stock. The following factors support negligible impact determinations for all affected stocks. Additionally, for both projects, pile driving will be restricted to daylight hours only. This allows animals to transit through the project areas and use the habitat during nighttime hours without the potential for noise-related harassment.

Pile driving and removal activities associated with the MRSI and CI Projects, as outlined previously have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level A and Level B harassment, from underwater sounds generated by impact and vibratory pile driving. Potential takes could occur if individuals are present in the ensonified zone when these activities are underway.

For the MSRI and CI Projects, take by Level A harassment is proposed to be authorized for California sea lions, Steller sea lions, and harbor seals to account for the possibility that an animal could enter a Level A harassment zone prior to detection, and remain within that zone for long enough to incur AUD INJ, *i.e.*, minor degradation of hearing capabilities within regions of hearing that align most completely with the energy produced by impact and vibratory pile driving (*i.e.*, the low-frequency region below 2 kilohertz (kHz)), not severe hearing impairment or impairment within the ranges of

greatest hearing sensitivity. Animals would need to be exposed to higher levels and/or longer duration than are expected to occur here in order to incur any more than a small degree of AUD INJ. If hearing impairment occurs, it is most likely that the affected animal would lose only a few dB in its hearing sensitivity. Due to the small degree anticipated, any AUD INJ from Level A harassment potentially incurred is not expected to impair an individual's ability to communicate, forage, or detect predators to a level that would impact reproductive success or survival, much less result in adverse impacts on the species or stock.

For the MSRI Project, NMFS proposes to authorize 17 takes by Level A harassment across three species/stocks (*i.e.*, California sea lions, Steller sea lions, and harbor seals), representing a small portion of each species' stock abundance. Because the ensonified area is relatively small, confined, and does not span the entire width of the river channel, animals can transit through the area outside the ensonified zones or during construction breaks, thereby reducing their potential for Level A harassment.

For the CI Project, NMFS proposes to authorize 247 takes by Level A harassment for three pinniped species/stocks (*i.e.*, California sea lions, Steller sea lions, and harbor seals). Despite the higher number of takes, this remains a small portion of each species' stock abundance. Similar to the MSRI project, the ensonified areas for the CI Project would not span the entire river channel, and the use of non-consecutive pile driving days provides additional opportunities for animals to transit the area without harassment.

As described above, NMFS expects that marine mammals would likely move away from an aversive stimulus, especially at levels that would be expected to result in AUD INJ, given sufficient notice through use of soft start. The USACE would also be required to shut down pile driving activities if marine mammals approach within hearing group-specific zones (see tables 17 and 18), further minimizing the likelihood and degree of AUD INJ and more severe behavioral responses. Even absent mitigation, no serious

injury or mortality from construction activities is anticipated or proposed to be authorized.

Effects on individuals that are taken by Level B harassment in the form of behavioral disruption, on the basis of reports in the literature as well as monitoring from other similar activities, would likely be limited to reactions such as avoidance, increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff 2006). Most likely, individuals would simply move away from the sound source and temporarily avoid the area where pile driving is occurring. If sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the area while the activities are occurring, particularly as both project areas are located along the FNC in the LCR with high amounts of commercial and recreational vessel traffic. We expect that any avoidance of the project area by marine mammals would be temporary in nature and that any marine mammals that avoid the project area during construction would not be permanently displaced. Pinnipeds on nearby haulouts may remain on these haulouts for longer or swim with their heads out of the water more often. Short-term avoidance of the project area and energetic impacts of interrupted foraging or other important behaviors is unlikely to affect the reproduction or survival of individual marine mammals, and the effects of behavioral disturbance on individuals is not likely to accrue in a manner that would affect the rates of recruitment or survival of any affected stock.

Additionally, and as noted previously, some subset of the individuals that are behaviorally harassed could also simultaneously incur some small degree of TTS for a short duration of time. However, since the hearing sensitivity of individuals that incur TTS is expected to recover completely within minutes to hours, it is unlikely that the brief hearing impairment would affect the individual's long-term ability to forage and communicate with conspecifics, and would therefore not likely impact reproduction or

survival of any individual marine mammal, let alone adversely affect rates of recruitment or survival of the species or stock.

The MSRI and CI Projects are also not expected to have significant adverse effects on affected marine mammals' habitats. The project activities would not modify existing marine mammal habitat for a significant amount of time. The activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected (with no known particular importance to marine mammals), the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

For the MSRI Project area there are no known haulouts or Biologically Important Areas within the ensonified zones. Marine mammals are expected to transit through the area during the proposed activities; therefore, any resulting impacts are expected to be short-term and minor, given the brief 8 days of pile driving.

In the CI project area, California sea lions, Steller sea lions, and harbor seals are common and frequently use haulout sites 24 A, B, and C. While pile installation for PD 68.35 is located approximately 200 m from haulout site 24 A, in-water construction at this site would be restricted to the month of November when pinnipeds are expected to be the least prevalent. Monitoring by the ODFW and CRITFC indicate high seasonal variability in haulout site use, with counts ranging from a single individual (January and April 2022) to as many as 1,766 pinnipeds (March 2023) (Brown, M., Personal communication, 2024).

Given the implementation of mitigation measures, the availability of alternative haulout sites in the LCR, the localized nature of ensonified areas, and the project’s short

overall duration of pile driving (66 days), the proposed activities are expected to have a negligible impact on the affected pinniped stocks.

Additionally, the CI Project area is a very small proportion of the stocks' overall range, with only a small portion of the overall stock expected to occur at these haulouts. Consequentially, the requested take does not represent a broad impact across the entire stock, but rather repeated exposures to the same individuals. Although the harbor seals that haul out in the project area may experience short term exposure to elevated noise levels, such intermittent disturbances, which are not expected to result in chronic stress or physical injury that would reduce the fitness, survival, or reproductive success of any individual. Because the anticipated impacts are localized to a small subset of the population and are not expected to affect the health of those individuals, the take proposed for authorization would not reach a level of biological significance that would affect annual rates of recruitment or survival for the Oregon/Washington coastal stock of harbor seals.

In summary and as described above, the following factors primarily support our preliminary determinations that the impacts resulting from the two separate specified activities are not expected to adversely affect any of the species or stocks through effects on annual rates of recruitment or survival:

- No serious injury or mortality is anticipated or authorized;
- The intensity of anticipated takes by Level B harassment is relatively low for all stocks and would not be of a duration or intensity expected to result in impacts on reproduction or survival;
- The ensonified areas are very small relative to the overall habitat ranges of all species and stocks, and would not adversely affect ESA-designated critical habitat for any species or any areas of known biological importance;

- The lack of anticipated significant or long-term negative effects to marine mammal habitat;
- The availability of nearby areas of similar habitat value (*e.g.*, foraging and haulout habitats) within and outside the LCR;
- Impacts on marine mammal feeding are not expected to result in significant or long-term consequences for individuals, or to accrue adverse impacts on their populations;
- The USACE would implement mitigation measures, such as soft-starts for impact pile driving and shutdowns to minimize the numbers of marine mammals exposed to injurious levels of sound, and to ensure that take by Level A harassment, is at most, a small degree of auditory injury.
- Previous monitoring reports for similar activities in the LCR have documented little to no behavioral effect on individuals.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds for each of the proposed IHAs that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted previously, only take of small numbers of marine mammals may be authorized under section 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of

marine mammals. When the predicted number of individuals to be taken is fewer than one-third of the species or stock abundance, the take is considered to be of small numbers (see 86 FR 5322, January 19, 2021). Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

Consistent with the small numbers finding required by the MMPA, NMFS has determined that the number of individuals proposed for authorization is small relative to the relevant stock abundances. For the MSRI Project, the number of takes proposed for all species is well below one-third of the best available population estimates, representing less than 1 percent for harbor porpoises and California sea lions, approximately 1.7 percent for Steller sea lions, and approximately 2.8 percent for harbor seals.

For the CI Project, the proposed instances of take for California sea lions (approximately 4.6 percent) and Steller sea lions (approximately 32.6 percent) are below the one-third threshold. However, the proposed instances of take for harbor seals (approximately 52.4 percent) are above one-third of the stock. While the total number of takes proposed for authorization represents a notable portion of the Oregon/Washington Coastal Stock of harbor seals, the percentage of the stock presented in table 17 assumes that all takes that were calculated as a guild, would occur for only harbor seals. However, it is more likely that take would be split between all three species/stocks of pinnipeds. Therefore, the proportion of the stock taken is expected to be much lower than 52 percent.

The percentage of stock in table 17 also assumes that the total takes proposed for authorization represent unique individuals. This assumption likely overestimates the number of individual animals affected. The largest number of pinnipeds documented during ODFW surveys from 2021 through 2024 was 1,766 individuals, which were not differentiated by species. If this maximum number of individuals were present in the project area and consisted entirely of either Steller sea lions or harbor seals, the resulting

take for either stock would be only approximately 4.9 percent and 7.8 percent, respectively. Therefore, the actual percentage of individual animals taken would be significantly less than one-third of the stock abundance for either species. This finding is further supported by the relatively short duration of the project (66 days) and the localized nature of the activities within a very small portion of the stocks' overall range. Given the short duration and small area of the Columbia River affected by the CI Project activities, it is highly unlikely that more than one-third of Steller sea lion and harbor seal stocks would occur in the area during active pile driving activities and be incidentally taken. The takes proposed for authorization are expected to involve repeated exposures of the same individuals as they transit through the area, rather than affecting a large number of unique animals. Therefore, NMFS finds that the amount of take proposed for authorization during CI Project activities represents less than one-third of each of the affected pinniped stocks.

Based on the analysis contained herein of the proposed activities (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS preliminarily finds for each of the proposed IHAs that small numbers of marine mammals would be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act

Section 7(a)(2) of the ESA of 1973 (16 U.S.C. 1531 *et seq*.) requires that each Federal agency ensures that any action it authorizes, funds, or carries out is not likely to

jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of incidental take authorizations, NMFS consults internally whenever we propose to authorize take for ESA-listed species.

No incidental take of ESA-listed species is proposed for authorization or expected to result from these activities. Therefore, NMFS has determined that formal consultation under section 7 of the ESA is not required for these actions.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue two IHAs to USACE for conducting construction at Miller Sands, Rice, and Cottonwood Islands in the LCR, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHAs can be found at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities*.

Request for Public Comments

We request comment on our analyses, the proposed authorizations, and any other aspect of this notice of the two proposed IHAs for the proposed MSRI and CI Projects. We also request comment on the potential renewal of these proposed IHAs as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform decisions on the request for these IHAs or subsequent renewal IHAs.

On a case-by-case basis, NMFS may issue a one-time, 1-year renewal IHA following notice to the public providing an additional 15 days for public comments when (1) up to another year of identical or nearly identical activities as described in the **Description of Proposed Activity** section of this notice is planned or (2) the activities as described in the **Description of Proposed Activity** section of this notice would not be

completed by the time the IHA expires and a renewal would allow for completion of the activities beyond that described in the *Dates and Duration* section of this notice, provided all of the following conditions are met:

• A request for renewal is received no later than 60 days prior to the needed renewal IHA effective date (recognizing that the renewal IHA expiration date cannot extend beyond 1 year from expiration of the initial IHA).

• The request for renewal must include the following:

1. An explanation that the activities to be conducted under the requested renewal IHA are identical to the activities analyzed under the initial IHA, are a subset of the activities, or include changes so minor (*e.g.*, reduction in pile size) that the changes do not affect the previous analyses, mitigation and monitoring requirements, or take estimates (with the exception of reducing the type or amount of take).

2. A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized.

• Upon review of the request for renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures will remain the same and appropriate, and the findings in the initial IHA remain valid.

Dated: April 23, 2026.

Kimberly Damon-Randall,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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