

# U.S. 101/Chehalis River Bridge Scour Repair Project Marine Mammal Monitoring Report

Washington State Department of Transportation  
September 2019



Submitted to:

National Marine Fisheries Service  
Office of Protected Resources  
1315 East-West Highway  
Silver Spring, Maryland 20910-3226

Prepared by:

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## **Introduction**

The Washington State Department of Transportation (WSDOT) maintains over three thousand bridges throughout the state. To improve, maintain, and preserve the bridges, WSDOT conducts construction, repair and maintenance activities as part of its regular operations. One of these projects was the scour repair at the U.S. 101 Chehalis River Bridge in Aberdeen, Washington, and is the subject of this Marine Mammal Monitoring Report.

It was anticipated that the project's timing and duration and specific types of activities (such as vibratory pile driving) may result in the incidental taking by acoustical harassment (Level B take) of marine mammals protected under the Marine Mammal Protection Act. WSDOT requested and received an Incidental Harassment Authorization (IHA) dated December 10, 2018 (Appendix A) for this project that covered Level B take of harbor seal (*Phoca vitulina*), California sea lion (*Zalophus californianus*), Steller sea lion (*Eumetopias jubatus*), gray whale (*Eschrichtius robustus*), and harbor porpoise (*Phocoena phocoena*).

In accordance with IHA monitoring requirements, this report summarizes results of marine mammal monitoring during vibratory pile driving.

## **Project Location**

The U.S. 101 Chehalis River Bridge is located in the City of Aberdeen, Grays Harbor County, Washington (Figure 1). The bridge is located in Township 17 North, Range 9 West, Section 9, where the Chehalis River enters Grays Harbor. Land use in the Aberdeen area is a mix of residential, commercial, industrial, and open space and/or undeveloped lands (Figure 2).

## **Description of the Activity**

The Washington State Department of Transportation (WSDOT) completed the repair of an area of scour associated with Pier 14 of the U.S. 101 Chehalis River Bridge (Figures 3 and 4). The bridge foundation at Pier 14 was considered "scour critical" due to the bridge foundation being unstable for calculated scour depths. The southwest quadrant of Pier 14 was undermined by a scour void as much as 8 feet deep, and some of the untreated timber pilings were directly exposed to river/estuary water since 2008. Marine borers could have weakened enough pilings to require more extensive pier repair if this project had not been completed in the near future. In addition, the footing and seal were exposed at the other three quadrants of Pier 14. WSDOT also determined that removal of 28 timber piles (some of which may be treated with creosote) would benefit the environment. These piles were in the immediate vicinity of the scour repair project.

In preparation for conducting the repair, a small tugboats towed a flexifloat (portable modular interlocking flotation system with spuds that requires less draft) supporting a crane, vibratory pile driver, dragline, clamshell bucket, and manlift to Pier 14. The tugboat also towed a second flexifloat with spuds to the bridge to deliver materials and other equipment at various times.

Debris around and under Pier 14 was removed with a crane, dragline, and/or clamshell bucket, under the direction of divers who attached the debris for removal.

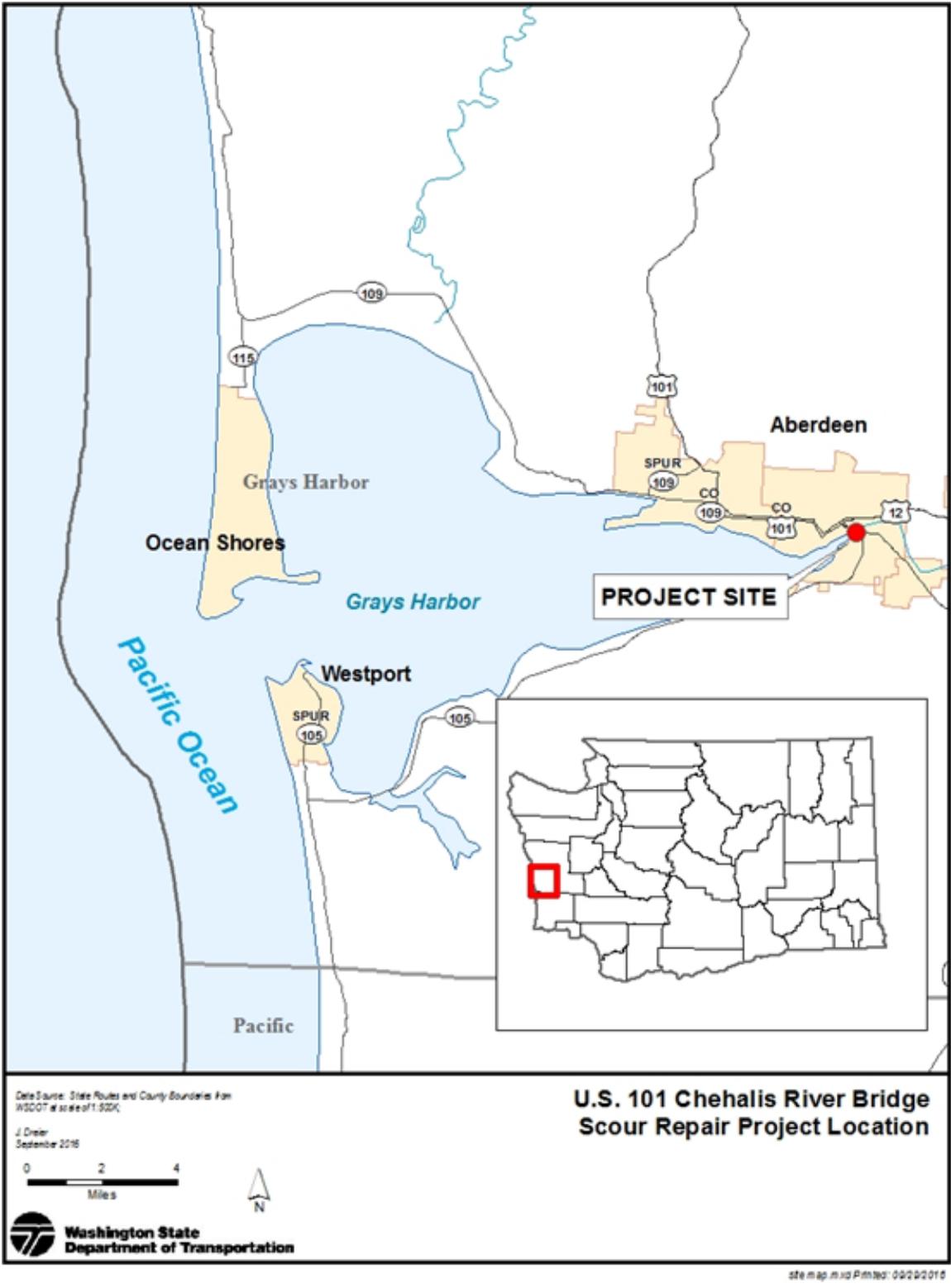


Figure 1. Project location

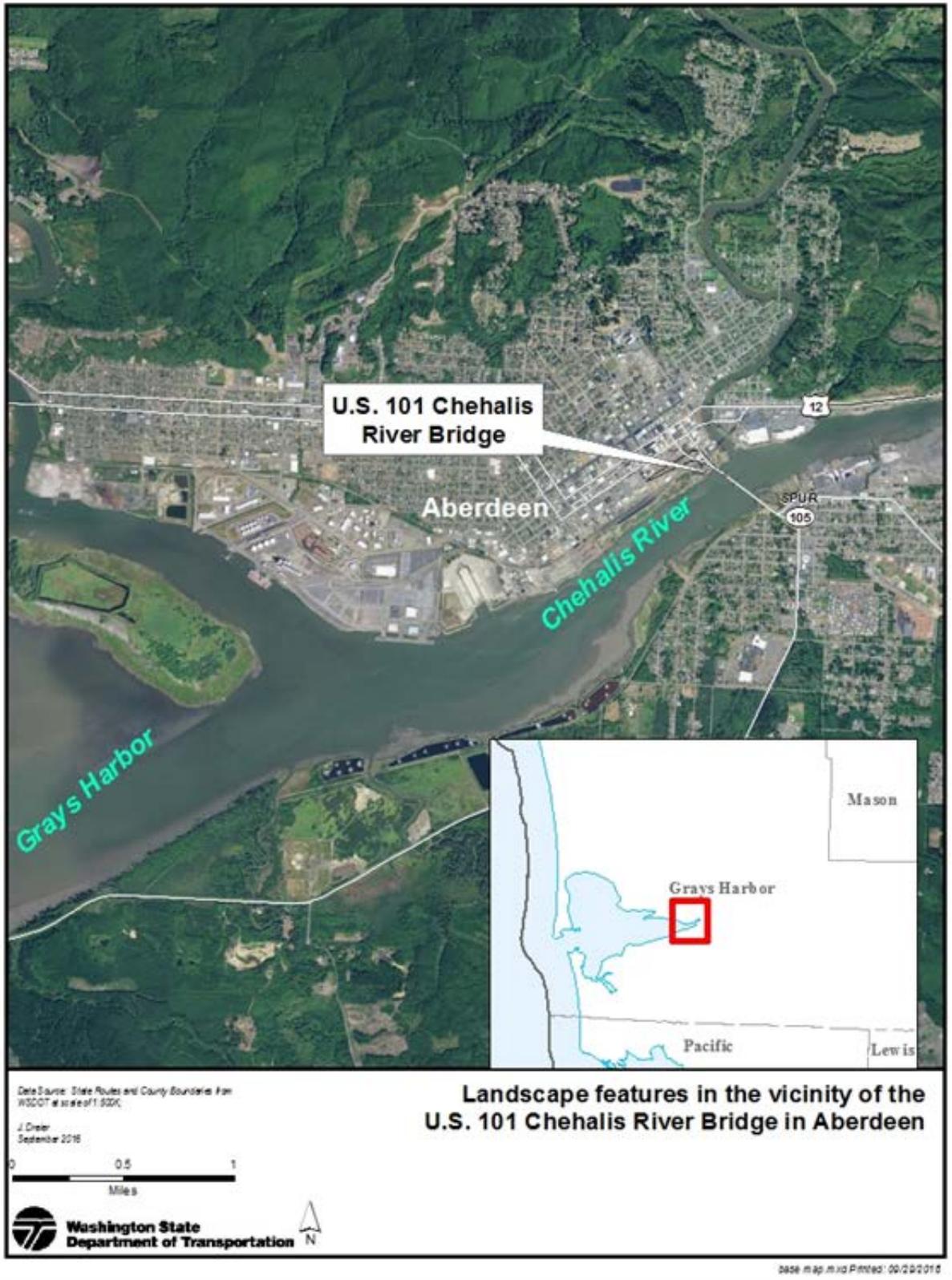
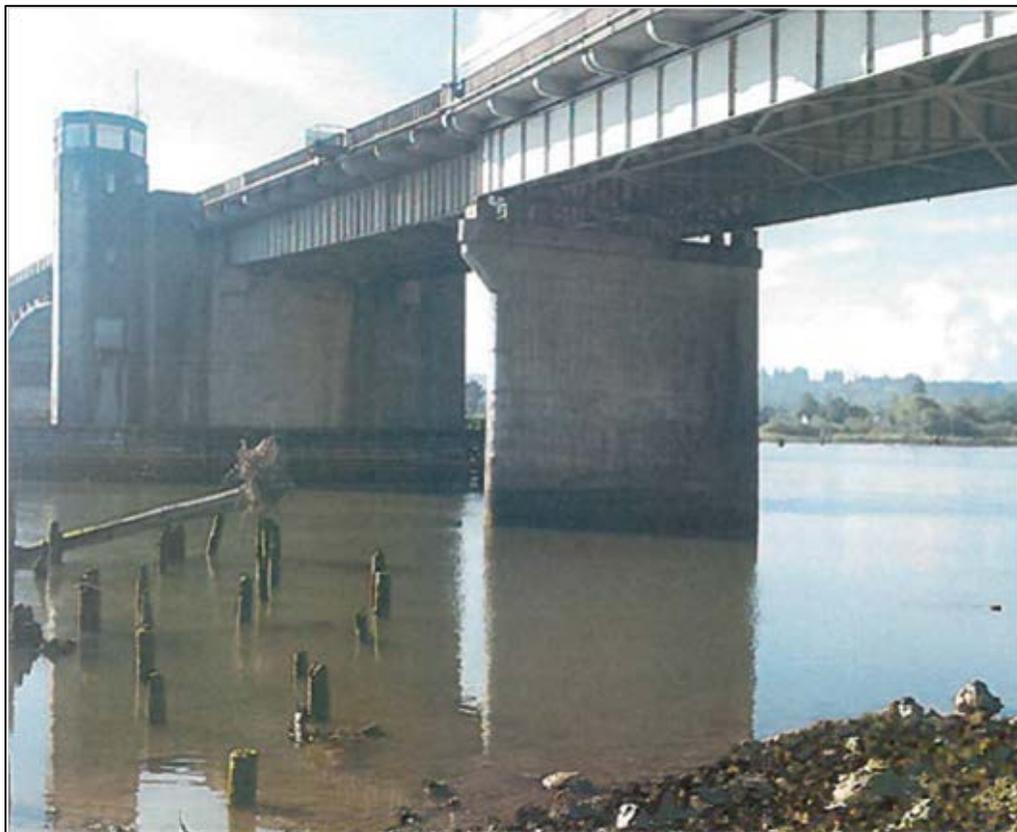


Figure 2. Landscape features in the vicinity of the project site.



**Figure 3. Pile driving and removal was limited to Pier 14**



**Figure 4. Pier 14 is located on the north side of the bridge.**

Twenty-eight timber piles of various sizes were removed using a vibratory hammer to loosen the piles. A cable was attached to the loose pile and the crane extracted it from the substrate. Sixteen H piles were driven with a vibratory hammer to provide support for a temporary walkway that extended from the shoreline to Pier 14. This walkway accommodated the piping system that conveyed water displaced by the scour repair to holding tanks on shore.

Once the shoring system and walkway were in place, cementitious material was pumped underwater inside the shoring system to fill voids between the riverbed and pier seal. Following this procedure, the walkway and temporary H piles were removed. The sheet piles became a permanent feature of the scour repair.

Average pile driving and removal durations were significantly less than proposed durations. The proposed estimated total duration of vibratory hammer operation was 2220 minutes (37 hours); the actual duration was only 245.45 minutes (4.09 hours). Table 1 compares the proposed and actual pile numbers and duration of vibratory hammer operation.

**Table 1. Comparison of proposed and actual piles installed and removed and duration of elevated underwater noise.**

Pile Type	Proposed			Actual		
	Number	Average driving/removal duration (minutes/pile)	Total duration (minutes)	Number	Average driving/removal duration (minutes/pile)	Total duration (minutes)
Sheet installation	18	30	540	17	4.75	80.75
H pile installation	6	30	180	16	3.00	48.00
H pile removal	6	30	180	16	1.80	28.80
Timber removal	44	30	1320	28	3.14	87.90
<b>Total duration</b>			<b>2220</b>			<b>245.45</b>

Due to National Marine Fisheries Service and the U.S. Fish and Wildlife Service in-water work timing restrictions to protect ESA-listed salmonids, in-water construction was limited to July 16 through February 15. For this project, construction was planned between July 16 and September 30, 2019.

## Monitoring Results

The project's Marine Mammal Monitoring Plan (Appendix B) was implemented for all pile driving and removal in the in-water work window (July 16-February 15). Monitoring was conducted over six days between July 17 and August 6, 2019 (Table 2).

**Table 2. Summary of monitoring period, activity, and conditions.**

Date	Monitoring Period		Activity		Wind speed (mph)	% Cloud cover	Visibility	Sea state	Tide state
	Begin	End	Pile type	Install/remove					
July 17	0635	2107	sheet	install	5	100	unlimited	2	Ebb/flood
July 23	0630	1507	sheet	install	0-3	95	unlimited	0	Ebb/flood
July 24	0545	1705	timber	remove	0-13	65	Unlimited to fair	0-3	Flood/ebb
July 25	0600	1559	H pile	install	0-15	0-95	Poor to unlimited	0-2	Flood/ebb
July 30	0630	1230	H pile	install	0-3	20	unlimited	1	flood
Aug 6	0600	1003	H pile	remove	5	100	good	1	flood

Permitted take, observations, and Level B take recorded are summarized in Table 3. A daily average of 2.5 individual harbor seals were detected within Level B zone. Monitoring data are provided in Table 4. As a precaution, vibratory hammer operation was shutdown twice on July 17 when there were two sightings approximately 180 feet from the activity. No shutdowns were required during other monitoring periods.

**Table 3. Summary of authorized and recorded take**

Species	Authorized Take by Level B Harassment	Individuals Observed	Level B Harassment Take Recorded
Harbor seal	214	21	15
California sea lion	12	0	0
Steller sea lion	12	0	0
Gray whale	2	0	0
Harbor porpoise	12	0	0

**Table 4. Marine mammal monitoring data.**

Date	Time	Station	Species	Number of individuals	Behavior	Direction from activity	Distance to activity (ft)	Distance to station (ft)	Estimated time in Level B zone (minutes)	Shutdown or delay
July 17 Sheet pile	0755	3	Harbor seal	1	Moving downstream	away	5000	50	15	Not required
	0806	1	Harbor seal	1	Moving upstream	away	3500	50	15	Not required
	1937	2	Harbor seal	1	Moving downstream	away	180	20	15	Precautionary shutdown
	2000	2	Harbor seal	1	Moving downstream	away	180	20	15	Precautionary shutdown
	2020	4	Harbor seal	1	unknown	unknown	1000	900	15	Not required
July 23 Sheet pile	0749	3	Harbor seal	1	Moving downstream	away	5000	150	10	Not required
	0942	1	Harbor seal	1	Moving upstream	away	3500	150	15	Not required
	1026	3	Harbor seal	1	Moving downstream	away	5000	60	5	Not required
July 24 timber	0559	2	Harbor seal	1	Moving downstream	away	700	600	15	Not required
	0612	3	Harbor seal	1	Moving downstream	away	5000	150	15	Not required
	1024	1	Harbor seal	1	Moving downstream	toward	1500	700	15	Not required
July 25 H pile	0904	1	Harbor seal	1	Moving downstream	toward	2000	300	15	Not required
	0918	3	Harbor seal	1	Moving upstream	toward	4000	120	0	Not required
	0931	1	Harbor seal	1	Moving downstream	toward	2000	300	15	Not required
	0931	3	Harbor seal	1	Moving upstream	toward	3000	750	0	Not required
	1003	3	Harbor seal	1	Moving downstream	away	5000	120	0	Not required
	1014	1	Harbor seal	1	Moving downstream	toward	2000	300	15	Not required
	1016	1	Harbor seal	1	Moving downstream	toward	2000	300	15	Not required
	1036	3	Harbor seal	1	Moving downstream	away	5000	60	0	Not required
1044	3	Harbor seal	1	Moving downstream	away	5000	100	0	Not required	
July 30 H pile		No observations								
Aug 6 H pile	0739	3	Harbor seal	1	Moving downstream	away	5000	100	0	Not required

**Appendix A**  
**Incidental Harassment Authorization**



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Silver Spring, MD 20910

Jeff Dreier  
Fish and Wildlife Biologist  
Washington Department of Transportation  
Environmental Services Office  
310 Maple Park Avenue SE  
Olympia, WA 98504

DEC 10 2018

Dear Mr. Dreier:

Enclosed is an Incidental Harassment Authorization issued to the Washington Department of Transportation, under the authority of Section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C. 1361 *et seq.*), to take small numbers of marine mammals by Level B harassment incidental to the US 101/Chehalis Bridge Repair Project in Washington State.

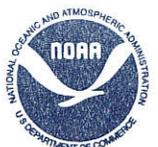
You are required to comply with the conditions contained in this Authorization. In addition, you must cooperate with any Federal, State or local agency monitoring the impacts of your activities. The Authorization requires monitoring the presence of marine mammals, mitigating adverse impacts to the lowest level practicable, and reporting any behavioral modifications resulting from your activity as observed by qualified individuals.

If you have any questions concerning the Authorization or its requirements please contact Rob Pauline, Office of Protected Resources, NMFS, at (301) 427-8401.

Sincerely,

Donna S. Wieting, Director  
Office of Protected Resources

Enclosure





## INCIDENTAL HARASSMENT AUTHORIZATION

The Washington State Department of Transportation (WSDOT) is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA; 16 U.S.C. 1371(a)(5)(D)) to harass marine mammals incidental to US 101/Chehalis River Bridge-Scour Repair Project in Aberdeen, Washington, when adhering to the following terms and conditions.

1. This Incidental Harassment Authorization (IHA) is valid from July 15, 2019 to February 15, 2020.
2. This IHA is valid only for in-water vibratory pile driving and removal activities associated with the US 101/Chehalis River Bridge-Scour Repair Project in Aberdeen, Washington.
3. General Conditions
  - (a) A copy of this IHA must be in the possession of WSDOT, its designees, and work crew personnel operating under the authority of this IHA.
  - (b) The species authorized for taking are the harbor seal (*Phoca vitulina*); California sea lion (*Zalophus californianus*); Steller sea lion (*Eumetopias jubatus*); gray whale (*Eschrichtius robustus*); and harbor porpoise (*Phocoena phocoena*).
  - (c) The taking, by Level B harassment only, is limited to the species listed in condition 3(b). See Table 1 (attached) for numbers of take authorized.
  - (d) The taking by injury (Level A harassment), serious injury, or death of any of the species listed in condition 3(b) of the Authorization or any taking of any other species of marine mammal is prohibited and may result in the modification, suspension, or revocation of this IHA.
  - (e) WSDOT must conduct briefings between construction supervisors, crews, and the marine mammal monitoring team prior to the start of all pile driving and removal activities, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

4. Mitigation Measures

The holder of this Authorization is required to implement the following mitigation measures:

- (a) In-water construction work must occur only during daylight hours.
- (b) For in-water heavy machinery activities other than pile driving, if a marine mammal comes within 10 meters (m), operations must cease and vessels must reduce speed to the minimum level required to maintain steerage and safe working conditions.



- (c) Pre-activity marine mammal monitoring must take place from 30 minutes prior to initiation of pile driving and removal. Post-activity marine mammal monitoring must continue through 30 minutes post-completion of pile driving and removal. Pile driving and removal may commence at the end of the 30-minute pre-activity monitoring period, provided observers have determined that the relevant shutdown zone (Table 8) is clear of marine mammals.
- (d) WSDOT must establish and monitor shutdown and Level B harassment zones:
  - i. Shutdown zone sizes for various pile driving activities and marine mammal hearing groups are shown in Table 2.
  - ii. Level B harassment zone sizes are shown in Table 3.
- (e) If a marine mammal approaches or enters the shutdown zone during activities or pre-activity monitoring, all pile driving activities at that location must be halted or delayed, respectively. If pile driving is halted or delayed due to the presence of a marine mammal, the activity may not resume or commence until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes have passed without re-detection of the animal. 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 thirty minutes. See Table 2 (attached) for minimum radial distances required for shutdown zones.
- (f) WSDOT must establish monitoring locations and protocols as described below. Please also refer to the Marine Species Monitoring Plan (Monitoring Plan, attached).
  - i. For vibratory pile driving of sheet piles, a total of four land-based PSOs must monitor the shutdown zone and Level B harassment zone as depicted in the Monitoring Plan.
  - ii. For vibratory pile removal of timber piles and vibratory installation and removal of H piles, a total of three land-based PSOs must monitor the shutdown and Level B harassment zones.
- (g) If a species enters or approaches the Level B harassment zone and that species is either not authorized for take or its authorized number of takes are met, pile driving and removal activities must shut down immediately. Activities must not resume until the animal has been confirmed to have left the area or an observation time period of 15 minutes has elapsed.

5. Monitoring

The holder of this Authorization is required to conduct marine mammal monitoring during pile driving and removal activities.

- (a) Monitoring during pile driving and removal must be conducted by NMFS-approved PSOs in a manner consistent with the following:
  - i. Independent PSOs (i.e., not construction personnel) who have no other assigned tasks during monitoring periods must be used.

- ii. At least one PSO must have prior experience working as a marine mammal observer during construction activities. Other PSOs may substitute education (degree in biological science or related field) or training for experience.
- iii. Where a team of three or more PSOs are required, a lead observer or monitoring coordinator must be designated. The lead observer must have prior experience working as a marine mammal observer during construction.
- iv. WSDOT must submit PSO CVs for approval by NMFS prior to the onset of pile driving.
- v. WSDOT must ensure that observers have the following additional qualifications:
  - a. Ability to conduct field observations and collect data according to assigned protocols.
  - b. Experience or training in the field identification of marine mammals, including the identification of behaviors.
  - c. Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations.
  - d. 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.
  - e. 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.

6. Reporting

The holder of this Authorization is required to do the following:

- (a) WSDOT must submit a draft report on all marine mammal monitoring conducted under this Authorization within ninety calendar days following the completion of monitoring. A final report must be submitted within thirty days following resolution of comments on the draft report from NMFS. The marine mammal monitoring report must contain, at minimum, the informational elements described below:
  - i. Date and time that monitored activity begins and ends for each day conducted (monitoring period);
  - ii. Construction activities occurring during each daily observation period, including how many and what type of piles driven;
  - iii. Deviation from initial proposal in pile numbers, pile types, average driving times, etc.

- iv. Weather parameters in each monitoring period (e.g., wind speed, percent cloud cover, visibility);
  - v. Water conditions in each monitoring period (e.g., sea state, tide state);
  - vi. For each marine mammal sighting:
    - a. Species, numbers, and, if possible, sex and age class of marine mammals;
    - b. Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
    - c. Location and distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
    - d. Estimated amount of time that the animals remained in the Level B harassment zone;
  - vii. Description of implementation of mitigation measures within each monitoring period (e.g., shutdown or delay);
  - viii. Other human activity in the area within each monitoring period
  - ix. A summary of the following:
    - a. Total number of individuals of each species detected within the Level B harassment zone.
    - b. Total number of individuals of each species detected within the shutdown zone and the average amount of time that they remained in that zone.
    - c. Daily average number of individuals of each species (differentiated by month as appropriate) detected within the Level B Zone, and estimated as taken, if appropriate.
- (b) Reporting injured or dead marine mammals:
- i. In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this IHA, such as serious injury, or mortality, WSDOT must immediately cease the specified activities and report the incident to the Office of Protected Resources, NMFS (301-427-8401), and the West Coast Region Stranding Coordinator, NMFS (206-526-4747). The report must include the following information:
    - 1. Time and date of the incident;
    - 2. Description of the incident;
    - 3. Environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility);

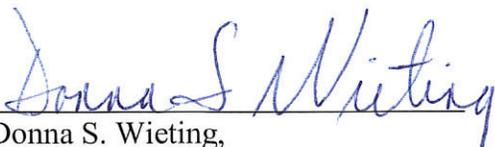
4. Description of all marine mammal observations and active sound source use in the 24 hours preceding the incident;
5. Species identification or description of the animal(s) involved;
6. Fate of the animal(s); and
7. Photographs or video footage of the animal(s).

Activities must not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with WSDOT to determine what measures are necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. WSDOT may not resume their activities until notified by NMFS.

- ii. In the event WSDOT discovers an injured or dead marine mammal, and the lead observer determines that the cause of the injury or death is unknown and the death is relatively recent (e.g., in less than a moderate state of decomposition), WSDOT must immediately report the incident to the Office of Protected Resources, NMFS, and the West Coast Region Stranding Coordinator, NMFS. The report must include the same information identified in 6(b)(i) of this IHA. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with WSDOT to determine whether additional mitigation measures or modifications to the activities are appropriate.
- iii. In the event that WSDOT discovers an injured or dead marine mammal, and the lead observer determines that the injury or death is not associated with or related to the activities authorized in the IHA (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), WSDOT must report the incident to the Office of Protected Resources, NMFS, and the West Coast Region Stranding Coordinator, NMFS, within 24 hours of the discovery. WSDOT must provide photographs or video footage or other documentation of the stranded animal sighting to NMFS.

7. This Authorization may be modified, suspended or withdrawn if the holder fails to abide by the conditions prescribed herein, or if NMFS determines the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals.
8. Renewals - On a case-by-case basis, NMFS may issue a second one-year IHA without additional notice when 1) another year of identical or nearly identical activities as described in the Specified Activities section is planned or 2) the activities would not be completed by the time the IHA expires and a second IHA would allow for completion of the activities beyond that described in the Dates and Duration section, provided all of the following conditions are met:
  - (a) A request for renewal is received no later than 60 days prior to expiration of the current IHA.

- (b) The request for renewal must include the following:
- (i) An explanation that the activities to be conducted beyond the initial dates either are identical to the previously analyzed activities or include changes so minor (e.g., reduction in pile size) that the changes do not affect the previous analyses, take estimates, or mitigation and monitoring requirements.
  - (ii) 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.
  - (iii) 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 remain the same and appropriate, and the original findings remain valid.

  
Donna S. Wieting,  
Director, Office of Protected Resources,  
National Marine Fisheries Service.

DEC 10 2018

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Date

**Table 1. Authorized Take Numbers, by Species**

<b>Species</b>	<b>Authorized Take by Level B Harassment</b>
Harbor seal	214
California sea lion	12
Steller sea lion	12
Gray whale	2
Harbor porpoise	12

**Table 2. Shutdown Zones for Various Pile Driving Activities and Marine Mammal Hearing Groups (Meters)**

<b>Source Type</b>	<b>Low-Frequency Cetaceans</b>	<b>High-Frequency Cetaceans</b>	<b>Phocid Pinnipeds</b>	<b>Otariid Pinnipeds</b>
14-inch timber removal	10	15	10	10
Sheet pile installation	35	55	25	10
H-pile installation and removal	10	10	10	10

**Table 3. Level B Harassment Zones**

<b>Pile type</b>	<b>Level B Harassment Zone Isopleth (meters)</b>
14-inch timber vibratory removal	1,360
Steel sheet vibratory driving	10,000
Steel H-pile vibratory driving and removal	1,000