REQUEST FOR AN
INCIDENTAL HARASSMENT AUTHORIZATION

UNDER THE
MARINE MAMMAL PROTECTION ACT

December 2009

Submitted To:

National Marine Fisheries Service
Office of Protected Resources
1315 East-West Highway
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Summary of the Request

The Washington State Department of Transportation – Olympic Region (WSDOT – OR), pursuant to Section 101 (a)(5)(D) of the Marine Mammal Protection Act (MMPA), 16 United States Code (U.S.C.) 1371 (a)(5); 50 Code of Federal Regulations (C.F.R) Part 216, Subpart I, requests that the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) issues an Incidental Harassment Authorization (IHA) for incidental take of six marine mammal species or stocks during the Manette Bridge replacement in Bremerton, WA starting in 2010.

The Manette Bridge is a functionally obsolete and structurally deficient bridge that requires replacement. It is located within the Puget Sound of Washington State, specifically at the outlet to the Port Washington Narrows. The Port Washington Narrows provides the only outlet from Dyes Inlet to Sinclair Inlet, and connection to the greater Puget Sound. Activities requested to be covered under the IHA include:

- Construction of temporary work trestles, which involves steel pile installation involving both vibratory and impact driving methods
- Construction of new bridge piers, which involves excavation of benthic material
- Barge anchoring and usage
- Removal of existing bridge
- Removal of temporary work platforms

Six marine mammal species, stocks or Distinct Population Segments (DPS) of a species, including two listed as threatened under the Endangered Species Act, (ESA) may be found in Sinclair or Dyes Inlets over the course of the year. They include harbor seal, California sea lion, Steller's sea lion, gray whale and orca whale (transient and southern resident distinct population segments). The IHA sought would allow the incidental, but not intentional, take of non-ESA listed marine mammals during the construction of the new Manette Bridge and deconstruction of the existing bridge.

Potential take of marine mammals associated with pile driving or other construction activities are not likely to be lethal or to have long-term negative consequences for the marine mammal populations, and any impact on the marine mammals would be no greater than negligible. Furthermore, there would be no adverse impact on the availability of marine mammals for subsistence harvest by the Northwest Treaty Tribes. This request is being filed to ensure that the activities described herein are conducted in compliance with the MMPA if small numbers of marine mammals are taken incidentally and unintentionally during the course of the Manette Bridge Replacement Project.

Regulations governing the issuance of an incidental take under certain circumstances are codified at 50 C.F.R. Part 216, Subpart I (Sections 216.101 – 216.108). Section 216.104 sets out 14 specific items that must be addressed in requests for take pursuant to Section 101 (a)(5)(D) of the MMPA and are addressed in this application.

Description of the Activity

A detailed description of the specific activity or class of activities that can be expected to result in incidental taking of marine mammals.

1.1 Introduction

The Washington State Department of Transportation (WSDOT) is responsible for the maintenance, repair and replacement of bridges and structures on state routes and interstates in Washington State. The Manette Bridge replacement project occurs in marine waters that support several marine mammal species. The Marine Mammal Protection Act of 1972 (MMPA) prohibits the taking of marine mammals, defined as "harass, hunt, capture or kill, or attempt to harass, hunt, capture or kill", except under certain situations. Section 101 (a)(5)(D) allows for the issuance of an incidental harassment authorization provided an activity will have negligible impacts to marine mammals and will not adversely affect subsistence uses of marine mammals. The project timing, duration and specific types of activities (such as pile driving) may result in the incidental taking by harassment of marine mammals protected under the MMPA. The WSDOT is requesting an IHA for four marine mammal species that may occur in the project vicinity, harbor seal, California sea lion, gray whale, and transient (non-resident) orca whale. In addition, two other marine mammal species that are protected under the Endangered Species Act (ESA) may occur in the project vicinity, Steller's sea lion and orca whale (southern resident distinct population segment (DPS)) but no "take" of these species is anticipated.

Additionally, Section 7 of the ESA requires that projects with a federal nexus evaluate and document impacts to threatened and endangered species and designated critical habitats before funding, authorizing, or carrying out an action that may affect the environment. This project has a federal nexus through funding from the Federal Highway Administration (FHWA) and two ESA listed species may occur in the project area. Section 7 of the ESA states that, "no provision of the Act shall take precedence over any more restrictive conflicting provision of the Marine Mammal Protection Act of 1972" and implies coordination with ESA consultations to ensure MMPA provisions.

1.2 Project Purpose, History and Need

The Manette Bridge has been determined to be both structurally deficient and functionally obsolete. As a result of this assessment, the bridge was officially added to the WSDOT Bridge Replacement Priority Array List in December of 1993. Currently, the bridge has a priority of 3 on the statewide list for the 2007-09 biennium.

As a result of inspections, bridges are "scored" for structural sufficiency on a scale of 0 to 100. A brand new bridge would receive a 100. A "structurally deficient" bridge is one that has elements requiring monitoring or repairs. A bridge with an 80 or less warrants corrective action. A bridge with a score of 50 or less should be replaced. The current structural sufficiency rating of the Manette Bridge is 32. A deficiency label does not mean a bridge is likely to collapse or is unsafe. Most deficient bridges remain open to traffic during maintenance and repairs. A "functionally obsolete" bridge is one in which

the deck geometry (lanes widths, etc.), load carrying capacity, clearance or approach roadway alignment no longer meets the usual criteria for the system of which it is an integral part.

The Manette Bridge was originally built in 1930. The bridge was constructed with five steel truss main spans on six concrete piers, elements still part of today's bridge. A 1949 contract replaced the original wooden deck and timber trusses in the outer spans with concrete and steel. The primary areas of structural deficiencies are in the concrete piers and the structural steel trusses, which are nearing 80 years old. The concrete in the foundations is in varying states of deterioration. Testing and analysis of concrete taken from the main piers from 1976 thru 2003 determined that deterioration in the concrete has resulted from a process called Alkali Silica Reaction (ASR).

ASR in concrete is a phenomenon that was first recognized in the U.S. around 1940 and has since been observed in many countries. ASR causes deterioration of mortars and concretes due to the swelling of gel formed by the reaction of alkali in cement-based materials with reactive silica in aggregates in the presence of water. The swelling of the gel generates tensile stresses in the specimen resulting in expansion and cracks. There is no known way to mitigate and fully address the ASR problem in the concrete foundations of the six piers supporting the steel truss spans.

Overall, the substructure components are in poor condition at the main piers (built in 1930) and in satisfactory condition at the approach piers (built in 1949). Columns and pier walls at the main spans exhibit leaching cracks, rust stains, delaminations, soft concrete, and formwork holes. Exposed rebar is visible above and below the tidal zone, however mass marine growth prevents an exact detailing of this exposure.

The foundation is exposed at all piers in varying degrees. Main Piers 2 and 3 are in the worst condition with the original footing and seals now indeterminate from each other. At the corners, corroded remnants of rebar are visible where the footings have been rounded to an approximate 4 ft. radius. The pedestals at these piers are not distinguishable from the marine growth. Several cofferdams have been constructed around the different piers to shore up soft concrete. Some undermining is occurring at these piers due to local scour conditions.

Contract repairs to the main concrete piers were completed in 1949 (Piers 4 and 6) and 1991 (Pier 5) and 1996 (Piers 4 and 6). These repairs attempted to encase the deteriorating concrete in the concrete foundations but were not effective since the core concrete with ASR continues to deteriorate.

In 1993, the WSDOT Bridge Engineer identified that the bridge superstructure (trusses and deck) could be rehabilitated to provide 20 or more years of additional service life. The cost to totally rehabilitate this bridge by: encasing and repairing all the concrete main piers; replacing corroded steel including rivets and connections; repainting the entire bridge and replacing the bridge deck could exceed 50-75% of the replacement costs. However, there are no practical means to restore or prevent further deterioration in the column and footing concrete. The condition of the reinforcing steel in the highly fractured substructure concrete is an added unknown. As a result of this assessment, it was determined that replacement of the bridge is warranted and necessary. The Legislature and the Governor have provided approximately $65 million for the

replacement of the Manette Bridge over the next 8 years with construction of the new bridge scheduled to begin in 2010.

1.3 Project Setting and Land Use

The City of Bremerton is undergoing a series of revitalization projects which are outlined in a Comprehensive Plan. The Comprehensive Plan guides the city's overall strategy for growth and development over a 20 year period. It is divided into seven elements: Community Character, Land Use, Housing, Transportation, Environment, Economic Development, City Services (Utilities and Capital Facilities).

The Downtown Regional Center, on the west side of the bridge, is the retail center of the city (Figure 1-1, Photo 1). Retail businesses are at street level with residences and offices on upper floors. Washington State Ferries (WSF) operates passenger and vehicle ferry service from a terminal south of the bridge in the Downtown Regional Center.

The Manette Neighborhood, on the east side of the bridge, is characterized in the plan with dense single-family residential homes with small shops, restaurants and specialty businesses (Figure 1-1, Photo 2).

Photo 1. Downtown Regional Center, image from http://www.citytest.com/forms/communitydev/compplan/landuse01.pdf

Photo 2. Manette Neighborhood, image from http://www.citytest.com/forms/communitydev/compplan/landuse01.pdf

Figure 1-1. Downtown Regional Center and Manette Neighborhood.

The Puget Sound Naval Shipyard is adjacent to the Downtown Regional Center and has been in operation since 1891. The primary activities at the shipyard involve decommissioning nuclear submarines and storing inactive vessels, including several aircraft carriers (Figure 1-2).

Figure 1-2. Puget Sound Naval Shipyard, Bremerton, Washington, in February 2006. Image from: http://en.wikipedia.org/wiki/Image:PugetSoundNavalShipyardMothballs.jpg

1.4 Specific Project Activities

The proposed bridge replacement project will replace the structurally deficient and functionally obsolete Manette Bridge in the City of Bremerton with a new concrete bridge. The new Manette Bridge will be built parallel to, and immediately south of, the existing bridge with roadway connections to existing city street intersections on each end of the bridge. Construction of the project is proposed to begin in 2010 and continue for approximately 3 years.

The project will occur in three main phases. Construction sequence plan sheets are included in Appendix A. First, the new bridge piers and central portion of the new bridge will be constructed. Second, the outermost spans of the existing bridge will be removed and the new bridge's outermost spans and abutments will be built. This work includes the completion of stormwater facilities for the new bridge. Finally, the remaining portions of the existing bridge will be demolished and removed. The construction elements associated with these phases are summarized below and detailed in the following section *Construction Sequencing and Project Elements*.

The construction of the new bridge will require the construction of new piers and demolition of existing piers, all of which include work below the mean lower low water (MLLW) mark. An estimated 3,900 cubic yards of concrete will be placed below the MLLW mark for the new bridge piers. Temporary work trestles will be built in Port Washington Narrows as part of this project to support both the construction of the new bridge and demolition of the existing bridge. This also will include work below the MLLW mark. Barges will be used to transport and stage equipment and materials. They will be tethered with mooring lines and temporarily anchored buoys.

The footprint of the proposed approaches and abutments is primarily located within the existing bridge footprint. However, an additional 0.75 acre of land will be temporarily disturbed during construction and 0.15 acre of land will be permanently converted to roadway.

Work trestle construction will include pile driving and falsework bents. Conceptual work/demolition trestle plan sheets are included in Appendix B and D. Up to 542 steel piles, ranging in diameter from 24 to 36 inches will be installed for the work trestle, demolition trestle and barge moorage. The work trestles will cover an area of up to 55,900 square feet.

The proposed project will construct 1.789 acre of new impervious surface (bridge and approaches) and will remove 1.133 acres of existing impervious surface, with a net increase of 0.656 acre. Runoff from the proposed project will be treated via the City of Bremerton stormwater facilities. In addition to treating the runoff from the new bridge, the new stormwater system will treat runoff from an additional 0.81 acre of existing impervious surface, the stormwater from which is currently discharged untreated into Sinclair Inlet.

1.5 Construction Sequencing

The following is a description of the sequence of anticipated work activities associated with the Manette Bridge replacement project. Specific project elements are discussed in more detail in the subsequent section.

Access & Work Platforms

1. Work trestles and associated false work will be constructed at new pier locations in Port Washington Narrows for equipment and labor access. Work trestles will consist of steel piling, steel beam framing, and timber decking.
2. Buoys will be installed to moor material and work barges that will be used for construction of the new piers.

Sub-surface Shafts

3. Templates will be installed for the new pier shaft foundations. Templates will consist of steel piling with steel bracing around the shaft casings.
4. Shaft casings will be installed.
5. Shaft foundations will be excavated.
6. Steel reinforcing cages will be installed and the shafts filled with concrete.

Piers, Columns, and Crossbeams

7. After shafts are completed, it is expected that pre-cast, stay in place, forms will be stacked on top of the shafts up to the cross beam level, steel reinforcement cages will be placed inside, and the forms/columns filled with concrete.
8. A crossbeam will be constructed on top of the columns, possibly pre-cast.

Girders and Deck (between piers 2 and 7)

9. Falsework towers for the pre-cast girders will be placed as shown on the conceptual access plans (Appendix A). Girders are likely to be fabricated off site and will be shipped to the site on barges. The girders will then be placed on the piers and falsework towers between piers 2 and 7.
10. After completion of the girder placement and casting of diaphragms connecting the girders, post-tensioning strands will be placed into ducts cast in the girders. The post-tensioning strands will then be stressed.
11. The roadway deck will then be formed and cast between piers 2 and 7.

Outermost Spans, Abutments, and Road Approaches

12. The existing bridge will then be temporarily closed to the public to allow construction of the outermost spans and abutments for the new bridge – that "overlap" with the existing bridge – to be constructed. This phase of work,

targeted for three months duration, includes removal of the outermost spans and abutments of the existing bridge. New abutments will then be constructed and remaining girders and deck placed. Approach slabs, retaining walls, bridge barrier and sidewalks will also be constructed.

Demolition of Existing Bridge and Removal of Work Platforms

13. The remainder of the existing bridge will be demolished and removed.
14. Falsework towers, work trestles, and mooring buoys will be removed.

1.6 Project Elements

1.6.1 Construction of Work Trestles and Falsework Towers

Separate work trestles will be constructed for the new bridge construction and existing bridge removal processes. The south trestles for access to the new bridge site will be constructed prior to the installation of the north trestles for bridge removal. The work trestles and associated falsework towers will be supported on steel pilings with diameters of 24 to 36 inches. The construction of the work trestles is estimated to take up to 9 months. The work trestles and falsework towers will be in place throughout the project duration, approximately 3 years.

The trestles will be located a few feet above the high water mark, with the exact height determined by the contractor and work site conditions. The trestles will be supported by steel girders attached to the piles and the deck will be composed of timbers. The new bridge construction work trestle will be supported by up to 360 piles and could cover an area of up to 40,000 square feet. The bridge removal work trestle will be supported by up to 170 piles and could cover and area of up to 15,900 square feet. Up to 12 additional piles may be used for project related moorage.

The timber decking on the work trestles will be placed tightly together to prevent and seepage through the timbers. Areas of the work trestle with voids will be covered with plywood. Plastic will be placed as needed to contain spoils. Toe-boards will be placed around the perimeter of the trestle to also help contain any spoils.

1.6.1.1 Pile Installation

On the Manette Bridge Replacement project all piles will be installed using a vibratory hammer unless an impact hammer is needed to drive a pile through consolidated material or meet bearing. Currently, pile driving is scheduled to occur July 1 to August 20 and October 6 to January 31 with an estimated 45 minutes per pile and 410 total hours of pile driving using a vibratory hammer. Pile driving activities will occur daily two hours after sunrise to two hours before sunrise April 1 to September 15 and a daily (overnight) rest period of 12 hours between pile driving activities during which no pile driving will occur. No pile driving will occur during nighttime hours.

1.6.1.1.1 Impact Hammer Method

Impact hammers are used to install wood, concrete, or steel piles. An impact hammer is a large steel device that works like a piston. Impact hammers have a guides (called a lead) that holds the hammer in alignment with the pile while a heavy piston moves up

and down, striking the top of the pile, and drives it into the substrate from the downward force of the hammer on the top of the pile.

To drive the pile, first the pile is moved into position and set in the proper location. Figure 1-4 shows a pile being placed in position before it is driven. Once the pile is set in place, pile installation with an impact hammer can take less than 15 minutes under good conditions, to over an hour under poor conditions (such as glacial till and bedrock, or exceptionally loose material in which the pile keeps moving out of position).

1.6.1.1.2 Sound Pressure/Noise Monitoring and Attenuation

The project will implement all aspects of the NMFS and USFWS Impact Pile Driving Sound Attenuation Specification, Revised: October 31, 2006 (Appendix C)

1.6.1.1.3 Vibratory Hammer Method

The vibratory hammer method is a common technique used in steel pile installation where the substrate allows this method to be used. A vibratory hammer is a large mechanical device mostly constructed of steel (weighing 5 to 16 tons) that is suspended from a crane by a cable. Vibratory hammers are attached to a derrick and positioned onto the top of a pile. The installation process begins by placing a choker around the pile and lifting it into vertical position with the crane. The pile will then be lowered into position and set in place at the mudline. The pile will be held steady while the vibratory hammer installs the pile to the required tip elevation (Figure 1-3). Measured noise levels for similar projects conducted by CalTrans and WSDOT are given in Table 1-1. For some load-bearing structures such as towers and trestles, the vibratory hammer can only install piles until they reach a certain level of resistance, at which time the vibratory hammer can no longer advance the pile to the required depth. To meet certain design criteria and ensure proper functioning of the structure, steel piles often must be advanced or proofed by striking them with an impact hammer. During the proofing process, an observer must record the number of inches the pile is embedded with each impact hammer blow. Data collected during this process is then sent to the Project Engineer for review to ensure the pile will meet the design criteria.

Figure 1-3. Impact Hammer Driving a Steel Pile on Left and Vibratory Hammer Driving a Steel Pile on Right.

Table 1-1. Vibratory Pile Installation Data, 10 meters from pile

Agency	Site	Pile Diameter (inches)	Peak (dB)	RMS* (dB)	SEL** (Single Strike) (dB)
WSDOT	Friday Harbor	24	180	177	167
CalTrans	Mad River Slough	12	171	155	155
	Stockton, CA	36	180	170	170
	Stockton, CA	36	185	175	175
	Richmond Inner Harbor	72	183	170	170
	Richmond Inner Harbor	72	195	180	180
	San Rafael Canal	H-Pile	161	147	NA
	Port of Oakland	Steel Sheet	177	163	162
	Port of Oakland	Steel Sheet	175	162	162
	Port of Oakland	Steel Sheet	177	163	163

* Impulse level (35 millisecond average) (Laughlin, 2005a, Illingworth & Rodkin, Inc. 2003. Appendix F)
** SEL for 1 second of continuous driving

1.6.2 Barge Anchoring and Usage

Barges will be used extensively throughout the project duration to provide access to work areas, support machinery, deliver and stage materials, and as a collection surface for spoils, construction debris, and materials from demolition. The actual number and dimensions of barges to be used will be determined by the contractor and work site conditions. However, it is estimated that up to 6 barges will be used at one time. A typical barge dimension is approximately 290 feet in length and 50 feet in width. Typical barge draft is 4 to 8 feet and typical freeboard is 3 to 6 feet. Barges will be used throughout the construction period, approximately 3 years.

During working hours, barges will be attached to mooring lines, the work trestles, or to other portions of the project area, depending on the construction and access needs. Up to 6 temporary buoys may be installed to moor barges during non-working hours. These buoys will be attached to one or more anchors, which may need to be driven, or

excavated, due to hard ground and strong currents in the project area. If the Contractor chooses to deploy a dynamic barge positioning system, it is expected that the hours the system is in use will coincide closely with pile driving activities.

1.6.3 Construction of New Piers

Eight piers will support the new bridge, six in-water and two upland. The existing bridge has 13 piers, nine in-water and three upland. The total footprint of the piers will be 1416 square feet. The footprint of the nine in-water piers supporting the existing bridge is 8726 square feet.

Piers 1 and 8 are the bridge abutments and are located well above the mean high water line (MHW). Piers 2 through 7 are located below the MLLW line. The construction of the in-water piers (2 through 7) will take up to 18 months. The construction of the abutment piers (1 and 8) will occur during the bridge closure period (targeted duration of 3 months). The construction of each will include excavation of up to 3 shafts to support each pier, concrete pouring of each shaft, and construction of piers on top of new shafts.

Shaft casings will be installed and the shafts will be excavated using equipment positioned on the work trestles or barges.

To create a drilled shaft, a steel casing approximately 6 to 10 feet in diameter is driven into the substrate using a vibratory hammer, and the material inside the casing is excavated using an auger or a clamshell dredge (Figures 1-4 and 1-5). During excavation a premixed bentonite or synthetic polymer slurry is sometimes added to stabilize the walls of the shaft. Spoils from shaft excavation will be placed in a large steel containment box located on a barge or on the work trestle for offsite transport. During the drilling, polymer slurry is typically placed into the hole to keep side walls of the shaft from caving.

After completion of the excavation, a steel reinforcing cage is placed into the hole to specified elevations Figure 1-6). Concrete is then pumped into the hole using a tremie tube placed at the bottom of the excavation. As concrete is placed the tremie tube is raised but is maintained within the concrete. As the concrete is pumped into the hole, the slurry is displaced upward and removed from the top concrete using a vacuum hose (Figure 1-7). The slurry is pumped from the hole into large tanks located on the work trestle or on a barge, which is either recycled for use in the next shaft or transported off site. This procedure will be used on all shafts at each pier.

After shafts are completed, pre-cast concrete, stay-in-place forms will be stacked on top of the shafts up to the crossbeam elevation. A steel reinforcing cage will be placed inside the concrete forms and the columns will be filled with concrete. A pre-cast concrete crossbeam or a cast-in-place crossbeam, or some combination of both will be constructed on top of the columns. Falsework towers for the pre-cast girders will be placed as shown on the conceptual access plans. Girders will be fabricated off site and will be shipped to the site on barges. The girders will then be placed on the piers and falsework towers between piers 2 and 7.

After completion of the girder placement and casting of diaphragms connecting the girders, post-tensioning strands will be placed into ducts cast in the girders. The post-

tensioning strands will then be stressed. The roadway deck will then be formed and cast between piers 2 and 7.

Figure 1-4. Vibratory Installation of Drilled Shaft Casing.

Figure 1-5. Auger Excavation of Drilled Shaft.

Figure 1-6. Rebar Reinforcement of Drilled Shaft.

Figure 1-7. Vacuuming of Slurry from Drilled Shaft.

1.6.4 Installation of Girders and Decking

Girders and decking will be installed using the work trestles, falsework towers, and cranes deployed on work barges. The roadway deck will be made of concrete and will be poured in place. This work is expected to take 3 to 4 months.

1.6.5 Reconfiguration of abutments and roadway approaches

The existing bridge abutments will be removed, along with the associated retaining walls. New retaining walls and abutments will be constructed. These activities, and associated construction access will require the temporary disturbance of 0.75 acre of land, of which 0.15 acre are vegetated and permanent removal of 0.15 acre of vegetation. This work, all in upland areas, includes 2000 cubic yards of fill. Once the abutments are complete, the new bridge approach roadways will be constructed. Disturbed areas on the east shore of the Port Washington Narrows will be restored with a mix of native trees and shrubs including marine riparian vegetation and shoreline enhancement.

This revegetation work will occur during the next available planting window.

1.6.6 Stormwater Treatment

All stormwater will be treated via connection to the City of Bremerton's treatment system.

1.6.7 Demolition of Existing Bridge

The demolition of the existing bridge will occur in phases over a period of 18 months. After the central portion of the new bridge is constructed, the outermost spans and abutments of the existing bridge will be demolished and removed (see *Reconfiguration of abutments and roadway approaches*, above). Once the new abutments and outer spans are constructed, the demolition of the remainder of the existing bridge will proceed. Conceptual demolition plan sheets are included in Appendix D.

The bridge structure above the water line will be cut into manageable sections, using conventional concrete and metal cutting tools, or a wire saw, and placed on barges for transport to approved waste or recycling sites. The portions of the piers below the water line will be cut into pieces using a wire saw. All slurry from wire cutting operations above the water line will be contained and removed. All slurry from wire cutting operations below the water line will be dispersed by the current. Piers will be cut off at the ground level except for one, Pier 4. Pier 4 was built up to encapsulate original creosote treated timbers. Complete removal of the pier is not feasible and if it is cut at the ground level, many creosote treated timbers may be exposed. To minimize the risk of contamination, Pier 4 will be cut two feet above ground level.

1.6.8 Removal of falsework towers and work trestles

Once the demolition of the existing bridge is complete, the falsework towers and work trestles will be removed. Decking and girders will be placed on barges for transportation off-site. Piles will be removed using vibratory hammers, based on barges. The removal of the falsework towers and work trestles is expected to occur over 4 to 6 months.

1.6.8.1 Pile Removal

Vibratory extraction is a common method for removing steel piling. The pile is unseated from the sediments by engaging the hammer and slowly lifting up on the hammer with

the aid of the crane. Once unseated, the crane will continue to raise the hammer and pull the pile from the sediment. When the pile is released from the sediment, the vibratory hammer is disengaged and the pile is pulled from the water and placed on a barge for transfer upland. Figure 1-8 shows a timber pile being removed with a vibratory hammer.

Figure 1-8. Vibratory Hammer Removing a Timber Pile.

Sediments attached to the outside of the pile fall back to the seafloor in a short period of time (from several minutes to a few hours, depending on the sediment type, currents, and weather conditions).

1.7 Construction Equipment

To complete the proposed project, the following equipment is expected to be used: barges, cranes, pile drivers, hoe ram for bridge demolition, shaft excavation equipment, bulldozers, graders, dump trucks, jackhammers, grinders, concrete mixers, pavers, rollers, lane painting machinery, tug boats.

2.0 Dates, Duration and Region of Activity

The date(s) and duration of such activity and the specific geographical region where it will occur.

2.1 Dates and Duration

The Manette Bridge Replacement project is scheduled to begin in 2010 and continue for up to three years. In-water work will be restricted to work periods approved by National

Marine Fisheries Service, US Fish and Wildlife Service, and the Washington Department of Fish and Wildlife. These timing restrictions are intended to minimize impacts to marine mammals, marbled murrelets, federally listed salmonids, fish protected under the Magnuson-Stevens Fishery Conservation and Management Act, and forage fish spawning areas. Pile driving operations will not occur during nighttime hours and work that may occur will not be in-water and will likely consist of concrete work.

No in-water work will be allowed between **March 1** and **June 14** in water shallower than ordinary high water

2.2 Region of Activity

The Manette Bridge is located in Bremerton, Kitsap County, Washington. Bremerton's population is approximately 45,000 within 26 square miles, of which 87% is on land and 13% is marine waters. The legal description of the location is Township 24N, Range 2E, Section 13. The bridge spans the Port Washington Narrows, which connects Dyes Inlet with Sinclair Inlet (Figure 2-1). The bridge links the eastern and western portions of Bremerton, which are located on Point Herron and Point Turner, respectively.

Figure 2-1. Aerial View of Bremerton Vicinity (with the Manette Bridge circled).

3.0 Species and Numbers in the Area

The marine mammal species that may occur within the activity area and their distribution.

Six marine mammal species, subspecies or distinct population segments occupy the region of activity considered in this application (Table 3-1). For the purpose of this IHA application the relative frequency of observation are: Common > Occasional >Infrequent >Rare. All six have been observed in southern Puget Sound during certain periods of the year and may occur in Sinclair Inlet, Port Washington Narrows and Dyes Inlet, although direct observation in the vicinity of the Manette Bridge may not be documented. Marine mammals are managed as stocks and individuals from those stocks may occur over a broader geographic area than just the Port Washington Narrows, Sinclair Inlet and Dyes Inlet and, therefore, may be encountered throughout the Puget Sound, Strait of Juan de Fuca, Strait of Georgia, and the outer coast.

Table 3-1. Marine mammals that occur in southern Puget Sound.

Species	Timing of Occurrence	Frequency of Occurrence
Harbor seal *Phoca vitulina richardsi*	Year-round	Common
California sea lion *Zalophus californianus*	August - April	Occasional
Steller sea lion *Eumetopias jubatus*	August - April	Infrequent
Orca – Southern Resident *Orcinus orca*	October - November	Infrequent
Orca – Transient *Orcinus orca*		Rare
Gray Whale *Eschrichtius robustus*	January - May	Occasional

In 2006, WSDOT hired a contractor to conduct surveys for marbled murrelets and marine mammals. Ten surveys were conducted between the months of July 2006 and January 2007. This time period was chosen to sample because it represents the time period when most in-water work activities will occur. Two pinniped species and zero cetaceans were observed. Thirty four harbor seals, one California sea lion and one unidentified pinniped, likely a California sea lion, were observed over the six month

period. No marine mammals were observed during two of the ten surveys. The final report is included in Appendix E, and a figure from the report showing the location of pinnipeds seen while conducting surveys is extrapolated below (Figure 3-2). The codes indicate the species observed, the survey number and the individual animal observed, i.e. HASE 4-2 = A harbor seal (HASE 4-2) was observed during the 4th survey (HASE 4-2) and was the 2nd harbor seal observed (HASE 4-2) during the survey.

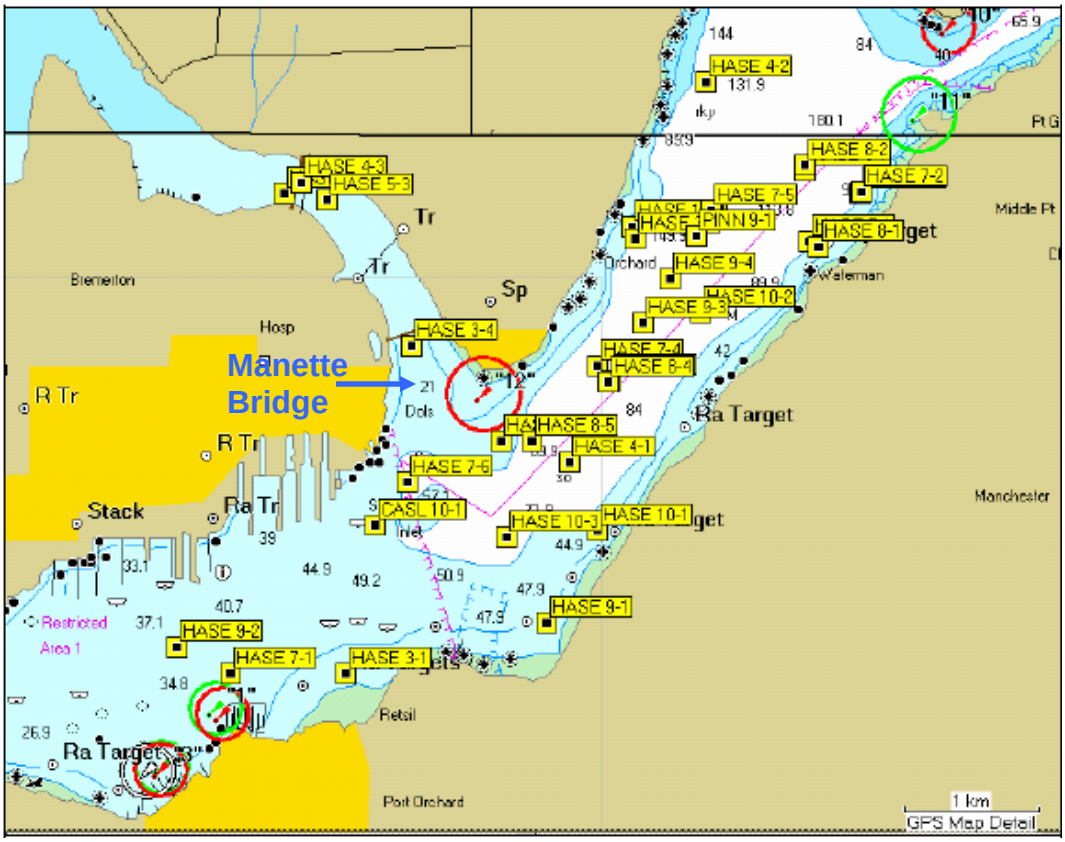

Figure 3-2. Harbor seal (HASE) and California sea lion (CASL) observations, July 2006 – January 2007 (from Bloxton and Raphael 2007).

3.1 Pinnipeds

3.1.1 Harbor Seal (*Phoca vitulina richardsi*)

Three distinct harbor seal (*Phoca vitulina richardsi*) stocks occur along the west coast of the continental U.S., the Washington inland stock, Oregon/Washington coastal stock, and California stock. The Washington inland stock includes Hood Canal, Puget Sound, and the Strait of Juan de Fuca out to Cape Flattery (NMFS 2003).

Harbor seals are the most common pinniped and the only species that breeds in the inland marine waters of Washington (Calambokidis and Baird 1994). In 1999, Jefferies et al. (2003) recorded a mean count of 9,550 harbor seals in Washington's inland marine waters. The estimated population was approximately 14,612 harbor seals. The

population across Washington increased at an average annual rate of 6% between 1983 and 1996 (Jefferies et al. 1997). Pupping and molting typically occurs between April and August.

Individuals are frequently observed in the Port Washington Narrows, Sinclair Inlet and Dyes Inlet. Harbor seals were observed during eight of ten surveys between July 2006 and January 2007. No more than six individuals were observed during any one survey period. There are no documented harbor seal haul-out areas within three miles of the Manette Bridge. One harbor seal haul-out estimated at less than 100 animals is documented in Dyes Inlet (Figure 3-3). These animals must pass through the Port Washington Narrows to gain access to Sinclair Inlet and the greater Puget Sound basin.

3.1.2 California Sea Lion

California sea lion (*Zalophus californianus)* occurs throughout the Pacific Rim and are separated into three subspecies, of which only one occurs in western North America (NMFS 2003). The subspecies is further separated into three stocks, the United States (US) stock, the Western Baja California stock and the Gulf of California stock (NMFS 2003).

The US stock of California sea lion breeds in California and southern Oregon between May and July. California sea lions do not breed in Washington. Pupping occurs on the breeding ground, typically one month prior to mating. Sea lions are typically observed in Washington between August and April, after they have dispersed from breeding colonies. Population estimates are calculated by conducting pup counts. Because California sea lions do not breed in Washington, accurate estimates of the non-breeding population in Washington do not exist. Estimates from the 1980s suggest the population size was just under 3,000 by the mid-1980s (Bigg 1985; Gearin et al. 1986). In the 1990s, the number of sea lions in Washington appears to have either stabilized or decreased (Gearin et al. 1988; Calambokidis and Baird 1994).

There are no documented California sea lion haul outs within three miles of the Manette Bridge. Two California sea lion haul-outs estimated at less than 10 animals are documented on bouys in Rich Passage (Figure 3.3). Individuals are infrequently observed in the Port Washington Narrows, Sinclair Inlet and Dyes Inlet. One California sea lion was observed during one of ten surveys between July 2006 and January 2007. An unidentified pinniped was also recorded during one survey and is believed to be a California sea lion, although positive identification was not possible.

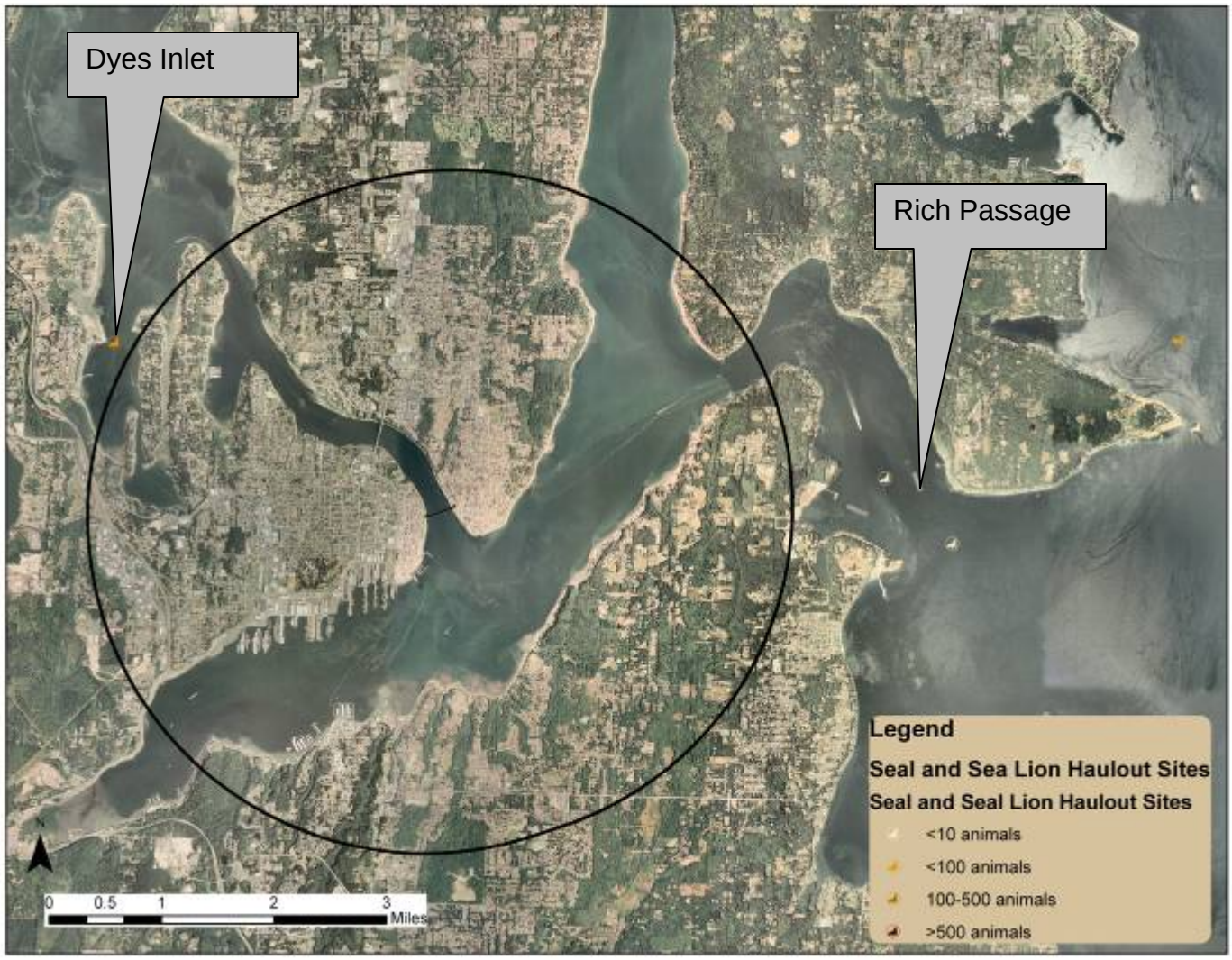

Figure 3-3. Seal and Seal Lion Haul-Out Sites in Vicintiy of Manette Bridge.

3.1.3 Steller Sea Lion

Steller sea lion occur along the north Pacific Rim with the population center in the Gulf of Alaska and the Aleutian Island chain. This species is separated into two stocks, Eastern and Western. The Eastern stock ranges from southeast Alaska south to California (NMFS 2006).

The Eastern stock breeds in Alaska, British Columbia, Oregon and California. Like California sea lions, they do not breed in Washington. Breeding typically occurs from May to July. Pupping occurs within days of returning to the breeding colony. Individuals, especially adult males and juveniles, disperse widely and travel great distances outside of the breeding season. These are typically the animals observed in Washington waters. Individuals typically return to breeding grounds in May, although in 2007-2008 two to six individual Steller sea lions remained all summer near Nisqually (southern Puget Sound near Olympia) on the Toliva Shoals and Nisqually buoys. There was also one Steller sea lion observed at Point Defiance (near Tacoma, WA) in July 2008. Furthermore, reports of Steller sea lions on the North Vashon, Manchester and

Bainbridge Island bouys increased in winter 2007-08 and spring 2008 although there are no estimates of individual numbers for these reports (Lambourn, D.2008). According to Jefferies (2008) there are also records from the 1990's of 200-300 Steller sea lions using Navy floats at the Fox Island Acoustic Range. Population estimates are calculated by conducting pup counts. Because Steller sea lions do not breed in Washington, accurate estimates of the non-breeding population in Washington do not exist. The majority of Steller sea lions are observed in the north Puget Sound and Strait of Juan de Fuca, although Steller sea lions are regularly observed at three haulout sites in central and southern Puget Sound. The nearest site, Shilshole Bay, is on the east side of the Puget Sound, adjacent to the city of Seattle approximately 12 miles from the Manette Bridge.

3.2 Cetaceans

In general, cetacean observations are infrequent in the Puget Sound (Calambokidis and Baird 1994, Jefferies 2007). During ten surveys for marine mammals in Sinclair Inlet and Port Washington Narrows between July 2006 and January 2007, no cetaceans were observed.

3.2.1 Gray Whale

The North Pacific gray whale stock is divided into two distinct stocks: eastern and western (Rice et al. 1984). The eastern North Pacific stock ranges from Alaska, where they summer to Baja California, where they migrate to calve in the winter.

Gray whales occur frequently off the coast of Washington during their southerly migration in November and December, and northern migration from March through May (Rugh et al. 2001, Rice et al. 1984). Gray whales are observed in Washington inland waters regularly between the months of January and September, with peaks between March and May (Cascadia Research Collective, unpub. report). The average tenure within Washington inland waters is 47 days and the longest stay was 112 days (Cascadia Research Collective, unpub. report).

Gray whales are reported in Sinclair Inlet, Port Washington Narrows or Dyes Inlet during migration. Between 2001 and 2007, gray whale sightings were reported during three years (Orca Network 2007). Reports occurred in April 2002, February, March and May 2005, and March and April 2007. The May 2005 observation was a stranding mortality at the Kitsap Naval Base in Bremerton (Orca Network 2007).

3.2.2 Orca Whale

Two sympatric populations of orca whales are found in the greater Puget Sound. These populations can be discriminated based on diet; one specializes on marine mammal prey (termed 'transient') and the other on fish prey (termed 'resident') (Calambokidis and Baird 1994). In addition to differences in diet, numerous other differences exist between transient and resident orca whales (Calambokidis and Baird 1994).

Southern resident orca whales are seen year-round in Washington's inland waters, primarily in the north Puget Sound in the vicinity of the San Juan Islands, and can be predictably encountered in some areas at certain times of the year (Calambokidis and Baird 1994). The southern residents are actually a large extended family, or clan,

comprised of three pods: J, K, and L pods and collectively number 83 individuals (Center for Whale Research 2008).

The southern residents are often seen during the summer in the protected inshore waters of Haro Strait (west of San Juan Island), in the Strait of Juan de Fuca, and Georgia Strait near Fraser River. J pod, with 24 members, is the pod is present in Washington's inland waters during at least part of every month of the year. They are frequently observed near the San Juan Islands, in the lower Puget Sound near Seattle and Vashon Island, and in Georgia Strait at the mouth of the Fraser River. K pod now has 19 members and in recent years has been present in the Puget Sound from May until December. L pod, with 40 members, is by far the largest resident pod and typically spends only the summer months in Washington's inland waters.

Southern resident orca whale presence is possible but unlikely in the action area. They were last seen in the action area in 1997. Nineteen members of L pod (subpod L-25) arrived on October 21, 1997 and stayed in Dyes Inlet for 30 days. A fall chum run has been suggested as the reason for the extended stay. The only access to Sinclair Inlet is to the north (Agate Passage) or south (Rich Passage) of Bainbridge Island.

Transient orca whale presence in the south Puget Sound is considered rare. Thus far, in 2008 there have been only two reports of transient orca whales in the south Puget Sound. One of these reports occurred in January just east of Maury Island and the other report of transients occurred in August in the Tacoma narrows.

4.0 Status and Distribution of Affected Species or Stocks

A description of the status of the affected species or stocks of marine mammals likely to be affected by such activities.

4.1 Harbor Seal

4.1.1 Status and Distribution

Harbor seals are not considered to be "depleted" under the MMPA or listed as "threatened" or "endangered" under the ESA (NMFS 2008). Based on currently available data, the level of human-caused mortality and serious injury is not known to exceed the potential biological removal (PBR) of 1,343 harbor seals per year. Therefore, the Oregon/Washington Coast stock of harbor seals is not classified as a "strategic" stock.

Harbor seals range along the northern coasts of North America, Europe and Asia, and are widely distributed in the Puget Sound.

4.2 California Sea Lion

4.2.1 Status and Distribution

California sea lions are not listed as "endangered" or "threatened" under the ESA nor as "depleted" under the MMPA. They are not considered a "strategic" stock under the MMPA because total human-caused mortality (1,483 fishery-related mortalities plus 78 from other sources) is less than the PBR (8,333) (Caretta et al. 2007).

California sea lions occur in the North Pacific Ocean from Mexico to Vancouver Island and dispersing males occur in the Puget Sound.

4.3 Steller Sea Lion

4.3.1 Status and Distribution

Steller sea lions were listed as “threatened” range-wide under the ESA on 26 November 1990 (55 Federal Register 49204). The population is comprised of two recognized management stocks (eastern and western), separated at 144 West longitude (Loughlin 1997). The western stock was listed as “endangered” under the ESA on 4 May 1997 and the eastern stock remains classified as “threatened” (62 FR 24345). Only the eastern stock is considered in this application because the western stock occurs outside of the geographic area of the activities under consideration. Steller sea lions are listed as “depleted” under the MMPA. Both stocks are thus classified as strategic.

Steller sea lions occur along the North Pacific Rim from southern California north to Alaska, the Aleutian Islands and across to Siberia and Japan. Individuals occur along the outer coast of Washington and occasionally in the Puget Sound.

4.4 Gray Whale

4.4.1 Status and Distribution

Gray whales were removed from listing under the Endangered Species Act in 1994. The Eastern North Pacific stock of gray whales is not classified as a strategic stock. Gray whales formerly occurred in the North Atlantic Ocean (Fraser 1970, Mead and Mitchell 1984), but this species is currently found only in the North Pacific (Rice et al. 1984). The eastern North Pacific Stock occurs along the west coast of North America. Summer distribution occurs in Alaska and winter distribution occurs along the southern California and Baja Mexico coast. Individuals that occur in Washington are migratory, moving between these two ranges.

Gray whales are observed in Sinclair Inlet, the Port Washington Narrows or Dyes Inlet occasionally during the winter and spring months. Individual animals do not appear to remain in the area for more than two weeks.

4.5 Orca Whale

4.5.1 Status and Distribution

On November 18, 2005 the Southern Resident stock was listed as an endangered distinct population segment (DPS) under the ESA (70 FR 69903). On November 29, 2006, the NMFS published a final rule designating critical habitat for the Southern Resident killer whale DPS (71 FR 69054). Both Puget Sound and the San Juan Islands are designated as core areas of critical habitat under the ESA, but areas less than 20 feet deep (relative to extreme high water) are not designated as critical habitat (71 FR 69054). A final recovery plan for southern residents was published in January of 2008 (NMFS 2008).

Transient orcas can be found in small groups from Mexico to the Bering Sea. They appear only occasionally in Washington's inland waters, usually near Vancouver Island. Transients specialize in a diet of marine mammals, especially seals, sea lions, and porpoises. There are about 170 transients, but they travel in small groups of one to five individuals, staying close to shorelines, often near seal rookeries when pups are weaned. Transient orca whales are not listed as "endangered" or "threatened" under the ESA nor as "depleted" under the MMPA.

Southern resident orca whales are seen year-round in Washington's inland waters, primarily in the north Puget Sound in the vicinity of the San Juan Islands, and can be predictably encountered in some areas at certain times of the year (Calambokidis and Baird 1994). The southern residents are actually a large extended family, or clan, comprised of three pods: J, K, and L pods and collectively number 83 individuals (Center for Whale Research 2008).

The southern residents are often seen during the summer in the protected inshore waters of Haro Strait (west of San Juan Island), in the Strait of Juan de Fuca, and Georgia Strait near Fraser River. J pod, with 24 members, is the pod present in Washington's inland waters during at least part of every month of the year. They are frequently observed near the San Juan Islands, in the lower Puget Sound near Seattle and Vashon Island, and in Georgia Strait at the mouth of the Fraser River. K pod now has 19 members and in recent years has been present in the Puget Sound from May until December. L pod, with 40 members, is by far the largest resident pod and typically spends only the summer months in Washington's inland waters.

Southern resident orca whale presence is unlikely but possible in the action area. They were last seen in the action area in 1997. Nineteen members of L pod (subpod L-25) arrived on October 21, 1997 and stayed in Dyes Inlet for 30 days. A fall chum run has been suggested as the reason for the extended stay. The only access to Sinclair Inlet is to the north (Agate Passage) or south (Rich Passage) of Bainbridge Island.

5.0 Type of Incidental Take Authorization Requested

The type of incidental taking authorization that is being requested (i.e., takes by harassment only, takes by harassment, injury and/or death), and the method of

incidental taking.

Under Section 101 (a)(5)(D) of the MMPA, WSDOT requests an IHA for takes by behavioral harassment during pile driving operations associated with the Manette Bridge Replacement Project from 2010-2013. WSDOT requests an IHA for incidental take of marine mammals described within this application for one year commencing in 2010. It is anticipated that WSDOT will request an annual renewal of the IHA until the project is completed, which is anticipated in 2013. WSDOT is not requesting a multi-year Letter of Authorization (LOA) at this time because the activities described herein are not expected to rise to the level of injury or death, which would require a LOA.

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] (50 C.F.R, Part 216, Subpart A, Section 216.3-Definitions).*

Level A is the more severe form of harassment because it may result in injury or death, whereas Level B only results in disturbance without the potential for injury (Norberg pers. comm. 2007a).

5.1 Take Authorization Request

Under Section 101 (a)(5)(D) of the MMPA, WSDOT requests an IHA for: Level B take (behavioral harassment) of non-ESA listed marine mammals described within this application during construction of the new Manette Bridge and demolition of the existing bridge. Take for two species of ESA-listed marine mammals (killer whales and Steller sea lions) is not requested for two main reasons: 1) proposed monitoring efforts and 2) species distribution and timing. The rationale is further explained in Section 5.2 “Method of Incidental Taking.” The WSDOT requests the IHA to begin coverage on June 1, 2010. It is anticipated that WSDOT will request an annual renewal of the IHA until project completion (estimated by 2013).

5.2 Method of Incidental Taking for Non ESA Species

Certain proposed activities (e.g. vibratory and impact pile driving) may result in Level B harassment. In addition to pile driving, behavioral harassment could also be caused by airborne noise from the equipment and human work activity in proximity to movement corridors and foraging sites.

Level A harassment will not occur because no impact pile driving will occur without a noise attenuating bubble curtain and pile driving will either not start or be halted if non-ESA listed marine mammals approach the zone of injury (Table 5-1). Vibratory pile driving will also be used, but is not expected to injure marine mammals. Table 5-2 summarizes recent Washington State Ferries (WSF) impact pile driving projects that were monitored with and without a bubble curtain. As shown in Table 5-2, all example

projects exceeded the behavioral (disturbance) threshold of 160 dB rms and the 180 dB rms injury threshold for cetaceans. All but one exceeded the 190 dB rms injury threshold for pinnipeds without a bubble curtain. With a bubble curtain however, all exceeded the 160 dB rms behavioral threshold, and all but one exceeded the 180 dB rms threshold for cetaceans and four of the six sites with good data exceeded the 190 dB rms threshold for pinnipeds.

Table 5-1. Marine Mammal Injury and Disturbance Thresholds for Underwater and Air Noise

Marine Mammals	Vibratory Pile Driving	Impact Pile Driving	
	Disturbance Threshold (injury is not expected)	Disturbance Threshold	Injury Threshold
Cetaceans	120 dB rms	160 dB rms	180 dB rms
Pinnipeds	120 dB rms	160 dB rms	190 dB rms

Table 5-2. Observed Underwater Sounds from Impact Pile Driving With and Without a Bubble Curtain

Ferry Terminal	Pile Diameter (in inches)	Without Noise Mitigation* dB peak	Without Noise Mitigation* dB RMS (impulse)	With Noise Mitigation* dB RMS (impulse)	Sound Reduction Achieved (dB re. 1 µPA)
Friday Harbor	24	212	189	195	4 dB average, 10 dB maximum**
Bainbridge	24	211	198	195	0 to 14 dB, 6 dB average
Eagle Harbor	30	211	193	183	9 dB average
Friday Harbor	30	212	195	195	3 dB average, 4 dB maximum
Anacortes	36	214	201	192	3 to 11dB
Mukilteo	36	214	201	179	19 to 23 dB

*Distance from the source was 10 meters, except for Eagle Harbor, which was between 9 to 16 meters. (Laughlin 2005a, 2005b, 2007, 2008 and Sexton 2007. Appendix F)

Using the site specific acoustic monitoring data recorded by WSDOT at several ferry terminals, WSDOT calculated underwater sound pressure level attenuation. WSDOT delineated zones of injury and harassment based on these calculations (Figure 3-4).

These safety zones will be monitored by qualified marine mammal observers and this monitoring is expected to avoid exposure of non ESA-listed marine mammals to injurious sound pressure levels by shutting down pile driving if an animal enters the injury safety zone (180 dB RMS for cetaceans, 190 dB RMS for pinnipeds). The monitoring protocol was developed with NMFS biologists (Appendix G).

Shutdown would be immediate if ESA-listed marine mammals were detected entering the disturbance safety zone for either impact or vibratory pile driving, thus preventing any incidental take from occurring. Shutdown would not occur if porpoises or dolphins, or non-listed pinnipeds were seen in the disturbance threshold for impact pile driving or

any non ESA-listed marine mammals were in the disturbance threshold for vibratory pile driving (hence, the need for an IHA), but behavior would be documented.

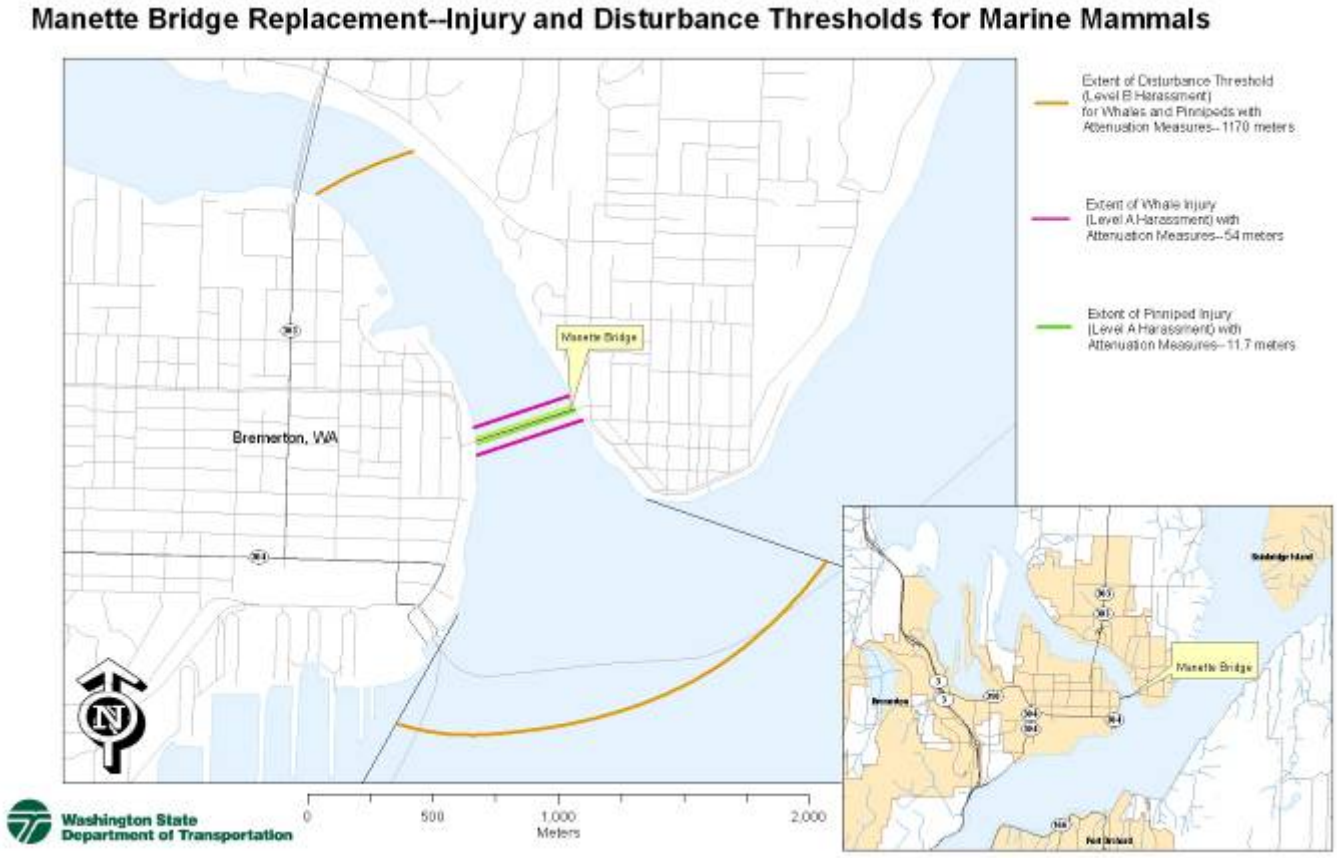

Figure 3-4. Underwater sound pressure level attenuation with area of harm and harassment delineated

5.3 No Take for ESA Species

WSDOT anticipates that the acoustic and visual sighting network in place, the Orca Network, will provide real-time data on the presence and location of ESA-listed killer whales. The Orca Network operates by monitoring numerous underwater hydrophones stationed throughout Puget Sound and the San Juan Islands, and through the real-time reporting of visual sightings of marine mammals in the region. The visual and acoustic sightings together provide an effective network capable of detecting large whale presence. The visual component of the network is less effective during times of inclement weather. As part of the monitoring plan, WSDOT will receive daily reports of the whale locations, numbers present, and direction of travel. This network has proven to be very helpful for local scientists studying the endangered southern resident killer whales, and WSDOT is confident that through communication with the sighting network all take can be avoided for this species.

The potential for a Steller sea lion to be exposed to project activities is unpredictably small (Norberg pers. comm. 2007). The nearest known haulout is approximately 12 miles from the bridge. Steller sea lions are sensitive to disturbance and tend to avoid areas with high levels of human activity (Lambourn pers. comm. 2007). Disturbance from construction mobilization and demobilization in itself is likely to be sufficient to cause Steller sea lions to avoid the immediate work area and zone of potential injury. Once impact pile driving begins, disturbance would only intensify, further decreasing the likelihood of Steller sea lion presence.

6.0 Number of Marine Mammals that may be Affected

By age, sex, and reproductive condition (if possible), the number of marine mammals (by species) that may be taken by each type of taking identified in [Section 5], and the number of times such takings by each type of taking are likely to occur.

6.1 Harbor Seal

There are no harbor seal haulouts within three miles of the project. The nearest haulout is in Dyes Inlet and animals must move through the Port Washington Narrows to access Sinclair Inlet and the greater Puget Sound. Individual harbor seals moving between Sinclair and Dyes Inlets will be exposed to project activities. Pile driving will not be initiated if harbor seals are observed in the zone of harm per the approved monitoring protocol.

A total of 34 harbor seals were detected during ten surveys conducted during the same time of year pile driving will occur, between July and January. Therefore, WSDOT assumes that up to 34 animals may be observed during any 10 day period. The age, sex and reproductive condition of the animals was not determined. WSDOT anticipates that for every day of pile driving between 3 and 4 harbor seals may be affected. Actual numbers indicate that 3.4 animals will be affected but since it is impossible to take only a portion on an animal a range of 3 to 4 is given. Although it is possible that the same 3 – 4 harbor seals are repeatedly affected. WSDOT anticipates that for every 10 days of pile driving, 34 harbor seals may be affected. If pile driving occurs every day of the month, between 102 and 124 harbor seals will be affected. If pile driving occurs during every day of every month of the approved in-water work window, between 822 and 1096 (actual = 931.6) harbor seals may be affected.

6.2 California Sea Lion

There are no California sea lion haulouts within three miles of the project. The nearest haulout is in Rich Passage, east of the Port Washington Narrows in more open water. Individual California sea lions moving between Sinclair and Dyes Inlets will be exposed to project activities. Pile driving will not be initiated if California sea lions are observed in the zone of harm per the approved monitoring protocol.

A total of one, possibly two California sea lions were detected during ten surveys conducted during the same time of year pile driving will occur, between July and January. Therefore, WSDOT assumes that up to two animals may be observed during any 10 day period. The age, sex and reproductive condition of the animals was not determined. WSDOT anticipates that for every day of pile driving less than 1 California sea lion may be affected. WSDOT anticipates that for every five days of pile driving, 1 California sea lion may be affected. If pile driving occurs every day of the month, between six and seven California sea lions may be affected. Actual numbers indicate that 6.2 animals will be taken but since it is impossible to take a portion of an animal, a range of six to seven is given. If pile driving occurs during every day of every month of the approved in-water work window, between 55 and 64 (actual = 56.6) California sea lions may be affected.

6.3 Steller Sea Lion

As previously stated, the nearest Steller sea lion haulout is approximately 12 miles northeast of the project in Shilshole Bay which is on the east side of the Puget Sound, adjacent to the city of Seattle. The implementation of conservation measures including a stop work plan if Steller sea lions are observed in the zones of harassment or harm preclude exposure to project activities. It is highly unlikely that any Steller sea lions will be encountered in the project area during the project; therefore Steller sea lion will not be affected.

6.4 Orca Whale

Orca whales (southern resident) have been documented in the project vicinity once in the last ten years. The implementation of conservation measures including a stop work plan if orca whales are observed in the zones of harassment or harm preclude exposure to project activities. It is unlikely that any orca whales will be encountered in the project area during the project; therefore orca whales will not be affected.

6.5 Gray Whale

Individual gray whales have been observed near the project area in four of the last eight years. Pile driving will not be initiated if gray whales are observed in the zone of harm per the approved monitoring protocol.

7.0 Anticipated Impact on Species or Stocks

The anticipated impact of the activity upon the species or stock of marine mammals.

Anticipated impacts resulting from the Manette Bridge Replacement project include disturbance from increased human presence and marine traffic while they are foraging, resting or traveling in the project area, and harassment or injury resulting from pile driving activities conducted while animals are underwater. Pile driving activities may cause harm to hearing or damage any air-filled internal organs (e.g. lungs), alter feeding

behavior or cause animals to disperse from the area. Other project activities may result in temporary modification in behavior such as avoidance of the project area or changes in foraging patterns due to increased traffic and human activity. Long-term impacts are not anticipated.

Potential direct effects on marine mammals resulting from the project fall into three categories: the effects of short-term construction-related noise, effects of work trestles and barge anchoring to passage conditions, and the effects of the new bridge and stormwater system on water quality.

Construction-related Noise

Underwater noise can alter movement patterns, delay or eliminate feedings, or cause direct damage or mortality to individuals at close range. In the project action area, construction-related noise and underwater sound pressure, particularly pile driving activities may affect marine mammals that occur in the project area throughout the period required to install the work trestles, and, to a lesser degree, the removal of the piles from the work trestle. However, exposure will be limited by monitoring marine mammals movements during pile driving. Pile driving will not begin until the zone of disturbance is determined clear of ESA listed marine mammals and the zone of harm clear of non-ESA listed marine mammals per the approved protocol. If a non-ESA listed species enters the zone of harm during pile driving, pile driving will cease until the individual(s) has left the zone of harm. If ESA listed species enter the zone of harassment or harm, pile driving will cease.

Work Trestles and Barge Anchoring

The construction and demolition work trestles will cover up to 55,900 square feet of the Port Washington Narrows throughout the construction period, a duration of approximately three years although neither trestle will be in place for that entire period. The size of these trestles have been reduced to the greatest extent practicable. The demolition trestle will be installed during the in-water work window immediately prior to initiation of bridge demolition activities occurring from this trestle and both trestles will be removed as soon as practicable following the completion of construction and demolition activities. Barge anchoring will occur adjacent to the construction and demolition work trestles creating a passage the width of the shipping channel between the Port Washington Narrows and Sinclair Inlet. Orcas especially can become confined by psychological barriers such as nets or low walls that they can physically cross, but for unknown reasons do not. Such was the case in 1994 in Barnes Lake near Ketchikan, Alaska when 10 orcas entered following salmon but then refused to leave until human intervention chased them out of the lake. One animal died from starvation. In 1997, orcas remained in Dyes Inlet for 30 days and there was concern that they too were ‘stuck’ but the animals left on their own accord. Work trestles and anchored barges may present this type of psychological barrier to orcas and discourage or prevent orcas from entering the Port Washington Narrows. The work trestles and barges may also discourage or prevent them

from exiting Dyes Inlet or Port Washington Narrows and returning to more open water.

Water Quality

Marine mammals are especially vulnerable to contaminants because their place in the food web encourages bioaccumulation of contaminants. Water quality conditions will generally improve as a result of the construction of stormwater treatment facilities associated with the project. Currently, stormwater from the existing roadway and bridge is discharged, untreated into the Port Washington Narrows. Post project, all stormwater leaving the bridge will receive treatment by the city of Bremerton.

8.0 Anticipated Impact on Subsistence

The anticipated impact of the activity on the availability of the species or stocks of marine mammals for subsistence uses.

8.1 Subsistence Harvests by Northwest Treaty Indian Tribes

Historically, Pacific Northwest treaty Indian tribes were known to utilize several species of marine mammals including, but not limited to: harbor seals, Steller sea lions, northern fur seals, gray whales, and humpback whales (Norberg pers comm. 2007b). More recently, several Pacific Northwest treaty Indian tribes have promulgated tribal regulations allowing tribal members to exercise treaty rights for subsistence harvest of harbor seals and California sea lions (Caretta et al. 2007). The Makah Indian Tribe (Makah) has specifically passed hunting regulations for gray whales (Norberg pers comm. 2007b). However, the directed take of marine mammals (not just gray whales) for ceremonial and/or subsistence purposes was enjoined by the Ninth Circuit Court of Appeals in a ruling against the Makah in 2002, 2003, and 2004 (Norberg pers comm. 2007b; NMFS 2007). The issues surrounding the Makah gray whale hunt, (in addition to the hunt for marine mammals in general) is currently in litigation or not yet clarified in recent court decisions (Wright pers. comm. 2007). These issues also require National Environmental Policy Act (NEPA) and MMPA compliance, which has not yet been completed. Presently, there are no known active ceremonial and/or subsistence hunts for marine mammals in Puget Sound or the San Juan Islands (Norberg pers comm. 2007b) with the following exceptions:

- Tribes along the coast are most likely to still have regulations in place allowing a small number of directed take for subsistence purposes. It is unlikely that those regulations have been exercised in recent years, but they are likely still on the books (Wright pers. comm. 2007).
- Many tribes in Puget Sound and on the Coast do have an additional current regulation that allows their fishermen to protect their life, gear, and catch from

seals and California sea lions by lethal means. These rare takes are reported annually to NMFS by each tribe (Wright pers. comm. 2007).

8.1.1 Harbor Seals

There have been only a few reported takes of harbor seals from directed tribal subsistence hunts (Caretta et al. 2007). It is possible that very few seals have been taken in directed hunts because tribal fishers use seals caught incidental to fishing operations in the northern Washington marine set gillnet and Washington Puget Sound Region treaty salmon gillnet fisheries, for their subsistence needs before undertaking a ceremonial or subsistence hunt (Caretta et al. 2007). From communications with the tribes, the NMFS Northwest Regional Office believes that zero to five harbor seals from this stock (the Washington Inland Waters Stock) may be taken annually in directed subsistence harvests (Caretta et al. 2007).

No impacts to the availability of the species or stock to the Pacific Northwest treaty tribes are expected as a result of the Manette Bridge Replacement Project.

8.1.2 California Sea Lions

Current estimates of annual subsistence take are zero to two animals per year (Caretta et al. 2007).

No impacts to the availability of the species or stock to the Pacific Northwest treaty tribes are expected as a result of the Manette Bridge Replacement Project.

8.1.3 Gray Whales

The Makah ceased whaling in the 1920's after commercial whaling decimated the eastern North Pacific (ENP) gray whale population (NMFS 2007). On June 16, 1994, gray whales were removed from the endangered species list after a determination that the population has "recovered to near its estimated original population size and is neither in danger of extinction throughout all or a significant portion of its range, nor likely to again become endangered within the foreseeable future throughout all or a significant portion of its range." (59 FR 31094). On May 5, 1995 the Makah formally notified the U.S. Government of their interest in resuming treaty ceremonial and subsistence harvest of ENP gray whales, asking the Department of Commerce to represent them in seeking approval from the International Whaling Commission (IWC) for an annual quota (NMFS 2007). On October 18, 1997 the IWC approved an aboriginal subsistence quota of 620 ENP gray whales (with an annual cap of 140) for the Russian Chukotka people and the Makah (Angliss and Outlaw 2005; NMFS 2007). On May 17, 1999 the Makah hunt, strike and land one ENP gray whale [sic] (NMFS 2005).

On December 20, 2002 the Ninth Circuit Court of Appeals ruled that an Environmental Impact Statement (EIS) (rather than an Environmental Assessment [EA]) should have been prepared under the NEPA and that the Makah must comply with the process prescribed in the MMPA for authorizing take of marine mammals otherwise prohibited by a moratorium (NMFS 2007). This was further upheld at rulings in 2003 and 2004 (NMFS 2007).

At the most recent meetings of the IWC (59th Annual Meeting in Anchorage, Alaska from May 28 - 31, 2007), an aboriginal subsistence quota for gray whales was again approved for natives in Russia and 20 whales or 4 per year for 5 years for the Makah (Norberg pers comm. 2007), but under the Ninth Circuit Court ruling the Makah must first obtain a waiver of the MMPA take moratorium before harvesting under their IWC quota (Norberg pers comm. 2007b). NMFS is currently preparing an EIS to examine the alternatives for a decision to approve or deny such a waiver (Norberg pers comm. 2007b).

Gray whales migrate north and south along the coast of Washington and there is a regular group of gray whales that enter the Puget Sound waters (specifically Saratoga passage on the eastern side of Whidbey Island) to feed during early spring and summer (March through May/June) (Calambokidis pers comm. 2007).

Should the Makah tribe resume hunting gray whales, this hunt would occur along the outer coast of Washington. Therefore, the proposed activities would not directly interfere with or affect the hunt. No impacts to the availability of the species or stock to the Pacific Northwest treaty tribes are expected as a result of the Manette Bridge Replacement Project.

9.0 Anticipated Impact on Habitat

The anticipated impact of the activity upon the habitat of the marine mammal populations, and the likelihood of restoration of the affected habitat.

The Manette Bridge Replacement Project can potentially affect habitat via impacts to water quality, prey species, and passage obstructions. Any negative impacts are temporary in nature and will not result in long-term impacts to habitat.

9.1.1 Water Quality

Water quality impacts are described above. Short-term turbidity affects a small proportion of the available habitat in the Puget Sound. Stormwater treatment will result in long-term water quality improvements.

9.1.2 Adverse Effects to Prey Species

Adverse effects to Puget Sound Chinook salmon resulting from the Manette Bridge Replacement Project are temporary in nature and affect a small proportion of the available prey base.

9.1.3 Passage Obstructions

Passage conditions under the Manette Bridge allow for migration, resting and foraging. However, passage conditions may be temporarily altered until the project is completed. The construction and demolition work trestles will cover up to 55,900 square feet of the Port Washington Narrows throughout the construction period, a duration of 3 years. Barge anchoring will occur adjacent to the construction and demolition work trestles

creating a narrow passage the width of the shipping channel (194 feet) between the Port Washington Narrows and Sinclair Inlet.

10.0 Anticipated Impact of Loss or Modification of Habitat

The anticipated impact of the loss or modification of the habitat on the marine mammal populations involved.

The Manette Bridge Replacement Project will not result in the loss of habitat available to marine mammals. The project will however modify habitat by creating access to habitat that is not currently available to marine mammals and their prey. The project will reduce the number of piers in the water from 13 to 6. The removal of existing bridge piers will provide access to 7310 square feet of benthos as well as portions of the water column currently occupied by the piers. The finished project will increase access and improve passage through the Port Washington Narrows ultimately benefiting marine mammals.

11.0 Mitigation Measures

The availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, their habitat, and on their availability for subsistence uses, paying particular attention to rookeries, mating grounds, and areas of similar significance.

The following Conservation Measures (CMs) will be employed for the duration of the Manette Bridge Replacement Project. General CMs used for all construction practices are listed first, followed by specific CMs for individual activities. The conservation measures are intended to avoid and minimize potential impacts to ESA listed species and designated critical habitat, as well as any marine mammals that may occur in the vicinity.

The language in each CM is included in the Contract Plans and Specifications and must be agreed upon by the contractor prior to any construction activities. Upon signing the contract, it becomes a legal agreement between the Contractor and WSDOT. Failure to follow the prescribed CMs is a contract violation.

WSDOT policy and construction administration practice is to have a WSDOT inspector on site during construction. The role of the inspector is to ensure contract compliance. The inspector and the contractor each have a copy of the Contract Plans and Specifications on site and are aware of all requirements. The inspector is also trained in environmental provisions and compliance.

11.1 All Construction Activities

All WSDOT construction is performed in accordance with the current WSDOT Standard Specifications for Road, Bridge, and Municipal Construction. Special Provisions contained in contracts are used in conjunction with, and supersede, any conflicting provisions of the Standard Specifications.

WSDOT activities are subject to state and local permit conditions. WSDOT uses the best guidance available (e.g., best management practices [BMPs] and conservation measures [CMs]) to accomplish the necessary work while avoiding and minimizing environmental impacts to the greatest extent possible.

The contractor shall be responsible for the preparation of a Spill Prevention, Control, and Countermeasures (SPCC) plan to be used for the duration of the project. The plan shall be submitted to the Project Engineer prior to the commencement of any construction activities. A copy of the plan with any updates will be maintained at the work site by the contractor.

- The SPCC must adhere to the measures outlined in the Implementing Agreement (IA) with the Department of Ecology (Ecology)/WSDOT Memorandum of Agreement (MOA) dated February 13, 1998 (to be superseded by any agreement that is more current than the 1998 IA) and shall identify construction planning elements, and recognize potential spill sources at the site. The SPCC shall outline BMPs, responsive actions in the event of a spill or release, and identify notification and reporting procedures. The SPCC shall also outline contractor management elements such as personnel responsibilities, project site security, site inspections, and training.
- The SPCC will outline what measures shall be taken by the contractor to prevent the release or spread of hazardous materials, either found on site and encountered during construction but not identified in contract documents, or any hazardous materials that the contractor stores, uses, or generates on the construction site during construction activities. These items include, but are not limited to gasoline, oils, and chemicals. Hazardous materials are defined in RCW 70.105.010 under “hazardous substance.”
- The contractor shall maintain, at the job site, the applicable spill response equipment and material designated in the SPCC plan.
- The contractor shall regularly check fuel hoses, oil drums, oil or fuel transfers valves, fittings, etc. for leaks, and shall maintain and store materials properly to prevent spills.

11.1.1 Equipment Noise Standards

To mitigate noise levels and, therefore, impacts to marine mammals, all construction equipment will comply with applicable equipment noise standards of the U.S. Environmental Protection Agency, and all construction equipment will have noise control devices no less effective than those provided on the original equipment.

11.2 Sound Attenuation Measures

Specific to pile driving, the following mitigation measures are proposed by WSDOT to reduce impacts to marine mammals to the greatest extent practicable.

11.2.1 Bubble curtains

All steel piles will be installed using a vibratory hammer until an impact hammer is needed for bearing or if a pile encounters consolidated material. If vibratory installation is not possible due to the substrate, an impact pile driver will be used. A bubble curtain(s) will be employed during impact installation of all steel piles following the NMFS and USFWS Impact Pile Driving Sound Attenuation Specification (Appendix C)

WSDOT will provide bubble curtain performance criteria to the contractor, which complies with the USFWS and NMFS Impact Pile Driving Sound Attenuation Specification – Revised: October 31, 2006. These criteria include:

1. Piling shall be completely engulfed in bubbles over the full depth of the water column at all times when an impact pile driver is in use. Bubble curtains are not required during vibratory pile driving.
2. The lowest bubble ring shall be in contact with the mud line for the full circumference of the ring. The weights attached to the bottom ring shall ensure the 100% mud line contact. No parts of the ring or other objects shall prevent the full mud line contact.
3. Air shall be delivered from bubbler ring assemblies (“bubblers”) at intervals shown on the Plans.
4. Bubblers shall be constructed of two-inch (2”) (minimum) inside diameter aluminum pipe with one-sixteenth-inch (1/16”) diameter bubble release holes in four rows with three-fourth-inch (3/4”) spacing in the radial and axial directions as indicated on the Plans. Bubblers shall be durable enough to withstand repeated deployment during pile driving and shall be constructed to facilitate underwater setup, knockdown, and reuse on the next pile. Material shall be as specified on the Plans.
5. One or more compressors shall be provided to supply air in sufficient volume and pressure to self-purge water from the bubblers and maintain the required bubble flux for the duration of pile driving. Compressors shall be of a type that prevents the introduction of oil or fine oil mist by the compressed air into the water. The presence of oil film or sheen on the water surface in the vicinity of the operating bubbler will indicate that Contractor has failed to meet this requirement. Contractor shall immediately stop work until the source of oil film or sheen is identified and corrected.
6. Bubbler feed lines (secondary feed lines) shall be sized taking into account backpressure at the exit point, in-line friction losses and losses through fittings.
7. The system shall provide a bubble flux of 3.0 cubic meters per minute per linear meter of pipe in each layer (32.91 cubic feet per minute per linear foot of pipe in each layer). The total volume of air per layer is the product of the bubble flux and the circumference of the ring:

8. Vt=3.0 m^3/min/m * Circum of the aeration ring in meters.

   Or

9. V_t=32.91 ft^3/min/ft * Circum of the aeration ring in meters.
10. The bubble ring manifold shall incorporate a shut off valve, flow meter, a throttling globe valve with a pressure gauge for each bubble ring supply as shown and detailed on the Plans.
11. Prior to first use of the bubble curtain during pile driving, the fully-assembled system shall be test-operated to demonstrate proper function and to train personnel in the proper balancing of the air flow to the bubblers. The test shall also confirm the calculated pressures and flow rates at each manifold ring. The Contractor shall submit an inspection/performance report to WSDOT within 72 hours following the performance test.
12. If a barge is used to house the pile-driver, it shall be isolated from the noise-producing operations. This isolation shall be such that noise from the pile driving operation is not transmitted through the barge to the water column.
13. The WSDOT Office of Air Quality and Noise has prepared a noise monitoring plan for the Manette Bridge Replacement Project (Appendix H). To comply with the with the provisions of the plan, the State will conduct hydroacoustic monitoring during construction to evaluate in water noise levels.
14. Hydroacoustic monitoring will be conducted during the first five steel piles struck with an impact hammer in water depths greater than two feet. It is not known where on the construction work trestles the Contractor will start. The water depths range between -1 and -40 feet. An additional fifteen piles (three groups of five) will be monitored that will represent of the variability across the Port Washington Narrows cross-section and the pile size(s) used. Bathymetry, total number of piles to be driven, depth of water, and distance from shore will be taken into consideration when choosing representative piles.
15. Ambient underwater sound levels will be measured prior to initiation of pile driving. Underwater sound levels will be continuously monitored during the entire duration of each pile being driven.
16. The WSDOT Office of Air Quality and Noise shall submit a monitoring report to NMFS and the USFWS within 60 days of completing hydroacoustic monitoring. The report shall include the information outlined in the pre-approved “Underwater Noise Monitoring Plan”.

11.3 Timing Windows

Timing restrictions are used to avoid in-water work when ESA listed species are most likely to be present. WSDOT will comply with all in-water timing restrictions as determined through the ESA section 7 and included in permit provisions.

11.4 Marine Mammal Monitoring

11.4.1 Visual Marine Mammal Monitoring and pile driving shutdown procedure

WSDOT has developed a monitoring plan (Appendix G) in conjunction with NMFS that will collect sighting data for each distinct marine mammal species observed during activities that includes driving steel pile greater than 10 inches. Marine mammal behavior, overall numbers of individuals observed, frequency of observation, and the time corresponding to the daily tidal cycle will also be included. An example of a marine mammal sighting form is included in Appendix I. A minimum of two qualified marine mammal observers will be present on site at all times during steel pile driving. In order to be considered qualified; the observer will meet the following criteria for marine mammal observers:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the waters surface with ability to estimate target size and distance. Use of binoculars may be necessary to correctly identify the target.
- Advanced education in biological science, wildlife management, mammalogy or related fields (Bachelors degree or higher is preferred).
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience).
- Experience or training in the field identification of marine mammals (cetaceans and pinnipeds), 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 that would include information such as the number and type of marine mammals observed; the behavior of marine mammals in the project area during construction, dates and times when observations were conducted; dates and times when in water construction activities were conducted; dates and times when marine mammals were present at or within the defined safety zone; dates and times when in water construction activities were suspended to avoid incidental harassment by disturbance from construction noise; etc.
- 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.

WSDOT proposes the following Marine Mammal Monitoring Plan and shut down procedures for steel impact pile driving:

- To verify the required monitoring distance, the safety zone will be determined by using a range finder or hand held global positioning system (GPS) device. The zone will be monitored by driving a boat along and within the radius while visually scanning the area, and or monitoring from shore if there is a vantage point that will allow full observation of the zone.
- If the safety zone is obscured by fog or poor lighting conditions, pile driving will not be initiated until the entire safety zone is visible.
- The safety zone will be monitored for the presence of marine mammals before, during, and after any pile driving activity.
- The safety zone will be monitored for 30 minutes prior to initiating the start of pile driving. If marine mammals are present within the safety zone prior to pile driving, the start of pile driving will be delayed until the animal(s) leave the safety zone.
- The safety zone will also be monitored throughout the time required to drive a pile. If a non-ESA listed marine mammal is observed entering the injury portion of the safety zone established for impact driving (180 dB RMS isopleth for cetaceans and 190 dB RMS isopleth for pinnipeds), pile driving operations will be discontinued until the animal has moved outside of the safety zone. Pile driving will resume only after the marine mammal is determined to have moved outside the safety zone by a qualified observer or after 15 minutes have elapsed since the last sighting of the marine mammal(s) within the safety zone.
- If marine mammals are observed, their location within the zone, and their reaction (if any) to pile driving activities will be documented.
- Monitoring of the safety zone will continue for 20 minutes following the completion of pile driving

11.4.2 Acoustical Monitoring

WSDOT will conduct hydroacoustical monitoring for impact driving of steel piles but not for vibratory pile driving. Acoustic monitoring will be conducted on twenty piles to monitor the in water noise levels created by impact pile driving. These twenty piles will occur in four groups of five piles that will represent the cross section conditions of the Port Washington Narrows. For standard underwater noise monitoring, one hydrophone positioned at midwater depth and 10 meters from the pile is used. A hydroacoustic monitoring plan for pile driving that has been developed with and approved by NMFS and the USFWS for section 7 consultations (Appendix H). This plan will be used to monitor underwater noise levels and to establish the radii of the safety zones established for marine mammals.

11.4.3 Safety Zone Establishment

For impact pile driving, the disturbance safety zone consists of all areas where the underwater sound pressure levels (SPLs) are anticipated to equal or exceed 160 dB rms for both pinnipeds and cetaceans. Prior to acquiring acoustic data, the safety zone will be defined based on the worst case underwater sound measured from impact driving of 36-inch steel pile.

Once impact pile driving begins, the zone will either be enlarged or reduced based on actual recorded SPLs from the acoustic monitoring. SPLs will be estimated to the 160 dB, 180 dB and 190 dB rms safety zones based on actual monitoring results collected at 10 meters from the pile. If a new safety zone is established based on SPL measurements, NMFS requires the new safety zone be based on the most conservative measurement (i.e., the largest safety zone configuration).

11.4.4 Modified Underwater Noise Mitigation Measures

Although marine mammals will be protected from Level A harassment by establishment of an air-bubble curtain during impact pile driving and marine mammal observers monitoring a safety zone, monitoring may not be 100 percent effective at all times in locating marine mammals. Therefore, WSDOT will also use a 'soft-start' technique at the beginning of each day's in-water pile driving activities or if pile driving has ceased for more than one hour to allow any marine mammal that may be in the immediate area to leave before pile driving reaches full energy. The soft start requires contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a one minute waiting period. The procedure will be repeated two additional times. If an impact hammer is used on a pile greater than 10 inches in diameter, contractors will be required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a one minute waiting period, then two subsequent 3-strike sets.

12.0 Arctic Subsistence Uses, Plan of Cooperation

Where the proposed activity would take place in or near a traditional Arctic subsistence hunting area and/or may affect the availability of a species or stock of marine mammal for Arctic subsistence uses, the applicant must submit either a plan of cooperation or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses. A plan must include the following:

(i) A statement that the applicant has notified and provided the affected subsistence community with a draft plan of cooperation;

(ii) A schedule for meeting with the affected subsistence communities to discuss proposed activities and to resolve potential conflicts regarding any aspects of either the operation or the plan of cooperation;

(iii) A description of what measures the applicant has taken an/or will take to ensure that proposed activities will not interfere with subsistence whaling or sealing; and

(iv) What plans the applicant has to continue to meet with the affected communities, both prior to and while conducting activity, to resolve conflicts and to notify the communities of any changes in the operation.

The proposed activities will take place in Bremerton, Washington, in the Port Washington Narrows. No activities will take place in or near a traditional Arctic subsistence hunting area.

13.0 Monitoring and Reporting Plan

The suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species, the level of taking or impacts on populations of marine mammals that are expected to be present while conducting activities and suggested means of minimizing burdens by coordinating such reporting requirements with other schemes already applicable to persons conducting such activity. Monitoring plans should include a description of the survey techniques that would be used to determine the movement and activity of marine mammals near the activity site(s) including migration and other habitat uses, such as feeding.

13.1 Monitoring Plan

WSDOT has developed a marine mammal monitoring plan in conjunction with NMFS, which will be implemented fully (Appendix G).

13.2 Reporting Plan

At the completion of each in-water work window for which there has been active monitoring in accordance with this plan, WSDOT will forward a monitoring report to NMFS within 30 days. Reports shall be sent to the attention of Alison Agness (NMFS). The report shall include:

- Observation dates, times, and conditions
- Copies of field data sheets or logs

14.0 Coordinating Research to Reduce and Evaluate Incidental Take

Suggested means of learning of, encouraging, and coordinating research opportunities, plans, and activities relating to reducing such incidental taking and evaluating its effects.

During previous vibratory pile driving activities at Lopez Island in the San Juan Islands, WSF coordinated with local marine mammal sighting networks (Orca Network; the Center for Whale Research; and/or the Whale Museum Whale Hotline) to determine the location of the southern resident killer whales prior to initiating vibratory pile driving (Ziegler 2006). These organizations receive sighting information primarily on orcas and other whales (gray whales, minke etc.); however, their sighting database also contains seal and sea lion data as well. All sightings received by the Orca Network are posted online usually within a few days and email notifications are sent out almost daily with current sightings. Sightings may also be reported to the Whale Museum Whale Hotline

where the information is cataloged into their database which is available upon request to the public and researchers. The Whale Museum receives sighting information from various sources including the Orca Network and all sightings are sent annually to NMFS.

Real-time coordination with these organizations will occur during pile driving activities. Communication between WSDOT and the aforementioned organizations will further reduce the potential for harassment by providing WSDOT with real-time data on the presence and location of marine mammals, particularly the ESA listed southern resident killer whales, prior to commencing activities that may harass marine mammals.

15.0 Conclusion

For the reasons discussed in this document, WSDOT has determined that the impact/effect of pile driving and other project activities associated with the Manette Bridge Replacement Project, should result in Level B harassment of small numbers of harbor seals, California sea lions, gray whales, and transient killer whales. With the mitigation measures described in this document, WSDOT has determined that no harassment of ESA listed killer whales and Steller sea lions will occur.

While behavioral modifications, including temporarily vacating the area around the bridge, may be made by the non-ESA listed species to avoid the resultant visual and acoustic disturbance, the availability of alternate areas within the inland waters, including haul-out sites and feeding areas, has led WSDOT to determine that this action will have a negligible impact on the aforementioned marine mammals species in Washington State. In addition, for non-ESA listed species no injury or mortality is anticipated and behavioral harassment takes should be at the lowest level practicable due to incorporation of the mitigation measures mentioned previously in this document.

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