

**Environmental Assessment
FOR
Issuance of an Incidental Harassment Authorization for the
Woodard Bay Natural Resource Conservation Area Habitat
Restoration Project, Washington**

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National Marine Fisheries Service, Office of Protected
Resources

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Abstract: The National Marine Fisheries Service proposes to issue an incidental harassment authorization to the Washington State Department of Natural Resources (DNR) for the taking, by Level B harassment, of small numbers of marine mammals, pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.). The DNR plans to remove derelict creosote pilings and trestle and pier structures associated with a habitat restoration project within the Woodard Bay Natural Resources Conservation Area, Washington. Presence of crew and operations may harass the resident harbor seals with the NRCA; however, any impacts are expected to have an insignificant impact on the population. The authorization would be valid from November 1, 2010 through February 28, 2011.

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CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

1.1 DESCRIPTION OF ACTION

On June 9, 2010, the National Marine Fisheries Service (NMFS) received an application from the Washington State Department of Natural Resources (DNR) requesting authorization to take, by harassment, small numbers of marine mammals incidental to derelict creosote piling and structure removal associated with a habitat restoration project within the Woodard Bay Natural Resources Conservation Area (NRCA), Washington. The specified activity includes removal of approximately 615 timber piling and a trestle located in Woodard Bay, as well as a portion of pier superstructure located at the mouth of Chapman Bay. Pilings would be removed by vibratory hammer extraction methods and structures would be removed via cable lifting. In addition, approximately 25 nest boxes for purple martins would be relocated from removed pilings to pilings that are retained for seal habitat and buffer, using a small boat if necessary and would require a battery powered drill. Activities would occur across 40 days between November 1, 2010, and February 28, 2011.

1.1.1 Purpose and Need

The purpose and need of the action is to ensure compliance with the MMPA and its implementing regulations for the activities associated with the habitat restoration project. The MMPA prohibits takes of all marine mammals in the U.S. (including territorial seas) with a few exceptions. Sections 101(a)(5)(A) and (D) of the MMPA direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional taking of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) if certain findings are made and regulations are issued or, if the taking is limited to harassment, notice of a proposed authorization is provided to the public for review.

Authorization for incidental takings may be granted for up to 5 years if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for certain subsistence uses, and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such taking are set forth. NMFS has defined "negligible impact" in 50 CFR 216.103 as: an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

NMFS' decision of whether or not to issue the Washington State DNR an IHA is a major Federal action that requires an analysis of its effect on the human environment pursuant to the National Environmental Policy Act (NEPA). This Environmental Assessment (EA) contains that analysis and is intended to support NMFS' issuance of an IHA authorizing the incidental take of small number of marine mammals associated with the habitat restoration project.

1.1.2 Objectives of the Woodard Bay Restoration Project

The primary purpose of the NRCA program, in general, is to protect outstanding examples of native ecosystems, habitat for endangered, threatened, and sensitive plants and animals, and scenic landscapes. The specified activities analyzed here are part of DNR's phased comprehensive effort to restore 500 acres of nearshore habitat to the Woodard Bay NRCA. The purpose of this phase of the project is to restore the nearshore habitat by removing the majority of creosoted structures while retaining the pilings that support the harbor seal haul-out and several buffer pilings to protect the population.

1.2 SCOPING SUMMARY

The purpose of scoping is to identify the issues to be addressed and the significant issues related to the proposed action, as well as identify and eliminate from detailed study the issues that are not significant or that have been covered by prior environmental review. An additional purpose of the scoping process is to identify the concerns of the affected public and Federal agencies, states, and Indian tribes. CEQ regulations implementing the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.) do not require that a draft EA be made available for public comment as part of the scoping process.

Under 50 CFR 216.104(b) of NMFS' implementing regulations for the MMPA, NMFS must, after deeming the application adequate and complete, publish in the *Federal Register* a notice of proposed IHA or receipt of a request for the implementation or re-implementation of regulations governing the incidental taking. Information gathered during the associated comment period is considered by NMFS in ensuring adequacy of preliminary determinations and proposed mitigation measures for IHAs. In accordance, a notice of proposed issuance of an IHA was published in the *Federal Register* on August 12, 2010 (75 FR 48941). The application and proposed IHA notice were made available for public review and comment for 30 days and provided to the Marine Mammal Commission. Comments received on the proposed IHA were also used to develop the scope of this EA. Comments were received from the Commission; no other public comments were received. Commission comments were specific to monitoring and mitigation and have been considered by NMFS.

1.3 APPLICABLE LAWS AND NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

This section summarizes federal, state, and local permits, licenses, approvals, and consultation requirements necessary to implement the proposed action, as well as who is responsible for obtaining them. Even when it is the applicant's responsibility to obtain such permissions, NMFS is obligated under NEPA to ascertain whether the applicant is seeking other federal, state, or local approvals for their action.

1.3.1 National Environmental Policy Act (NEPA)

NEPA was enacted in 1969 and its environmental review requirements set forth in Section 102(C) are applicable to all "major" Federal actions with the potential to result in significant effects on the quality of the human environment. A major Federal action is an activity that is fully or partially funded, regulated, conducted, or approved by a Federal agency.

NMFS issuance of incidental take authorizations represents approval and regulation of activities. While NEPA does not dictate substantive requirements for permits, licenses, etc., it requires consideration of environmental issues in Federal agency planning and decision making. The procedural provisions outlining Federal agency responsibilities under NEPA are provided in CEQ's implementing regulations (40 CFR Parts 1500-1508).

NMFS has, through NOAA Administrative Order (NAO) 216-6, established agency procedures for complying with NEPA and the implementing regulations issued by CEQ. NAO 216-6 specifies that issuance of incidental take authorizations under the MMPA and ESA is among a category of actions that are generally exempted (categorically excluded) from further environmental review if they are tiered to a pre-existing programmatic environmental review, except under extraordinary circumstances. When a proposed action that would otherwise be categorically excluded is the subject of public controversy based on potential environmental consequences, has uncertain environmental impacts or unknown risks, establishes a precedent or decision in principle about future proposals, may result in cumulatively significant impacts, or may have an adverse effect upon endangered or threatened species or their habitats, preparation of an EA or EIS is required. NMFS has not prepared a programmatic NEPA analysis covering the proposed IHA. Since issuance of the IHA has the potential to adversely affect species protected under the MMPA, NMFS has decided to prepare an EA to evaluate the context and intensity of such impacts to determine whether or not they have the potential to be significant. This EA is prepared in accordance with NEPA, its implementing regulations, and NOAA 216-6.

1.3.2 Endangered Species Act (ESA)

Section 7 of the ESA requires consultation with the appropriate federal agency (either NMFS or the U.S. Fish and Wildlife Service) for federal actions that "may affect" a listed species or adversely modify critical habitat. NMFS' issuance of an authorization affecting ESA-listed species or designated critical habitat, directly or indirectly, is a federal action subject to these Section 7 consultation requirements. Section 7 requires federal agencies to use their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered and threatened species. NMFS is further required to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of habitat for such species. Regulations specify the procedural requirements for these consultations (50 Part CFR 402).

1.3.3 Marine Mammal Protection Act (MMPA)

The MMPA prohibits takes of all marine mammals in the U.S. (including territorial seas) with a few exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (Secretary) to allow, upon request, the incidental, but not intentional, taking of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) if certain findings are made and regulations are issued or, if the taking is limited to harassment, notice of a proposed authorization is provided to the public for review.

Authorization for incidental takings may be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for certain subsistence uses, and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring, and reporting of such taking are set forth. NMFS has defined "negligible impact" in 50 CFR 216.103 as: "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Under the MMPA, harassment is defined as any act of pursuit, torment, or annoyance which has the potential to: (i) injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) 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). An IHA may be issued, except for activities that have the potential to result in serious injury or mortality (i.e., it may only authorize Level A and B harassment), for a period of no more than 1 year, following a 30-day public review period. Alternatively, regulations may be granted for a period of 5 years and may include takes by serious injury and mortality. Upon rulemaking (i.e., defining regulations), Letters of Authorization (LOAs) will be issued each year to the authorization holder. For both an IHA and regulations, authorization shall be granted if the Secretary finds that the taking will have a negligible impact on a species or stock, and that the IHA or regulations are prescribed setting forth the permissible methods of taking, the means of effecting the least practicable adverse impact, and requirements pertaining to monitoring and reporting. For authorizations associated with activities that could impact marine mammals in Arctic waters (i.e., waters north of 60°N), the action agency must also consider means of effecting the least practicable impact on the availability of the species for subsistence uses.

1.3.4 Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA)

Under the MSFCMA, Congress defined Essential Fish Habitat (EFH) as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10)). The EFH provisions of the MSFCMA offer resource managers means to accomplish the goal of giving heightened consideration to fish habitat in resource management. NMFS Office of Protected Resources is required to consult with NMFS Office of Habitat Conservation for any action it authorizes (e.g., research permits), funds, or undertakes, or proposes to authorize, fund, or undertake that may adversely affect EFH. This includes renewals, reviews, or substantial revisions of actions.

CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes the range of potential actions (alternatives) determined reasonable with respect to achieving the stated objective, as well as alternatives eliminated from detailed study. This chapter also summarizes the expected outputs and any related mitigation of each alternative. One alternative is the “No Action” alternative where the proposed permit would not be issued. The No Action alternative is the baseline for rest of the analyses. The Proposed Action alternative represents the research proposed in the submitted application for a permit, with standard permit terms and conditions specified by NMFS.

2.1 ALTERNATIVE 1 – NO ACTION

Under the No Action alternative, NMFS would not issue an IHA for the taking of marine mammals incidental the Woodard Bay NRCA habitat restoration project. Illegal takes of marine mammals could occur if no IHA is issued. Furthermore, mitigation, monitoring and reporting measures would not be carried out and therefore, impacts to marine mammals would be unknown if DNR moved forward with the habitat restoration project without obtaining an IHA.

2.2 ALTERNATIVE 2 – PROPOSED ACTION (ISSUANCE OF IHA WITH PROPOSED CONDITIONS)

Under the Proposed Action alternative, NMFS would issue an IHA to the DNR for activities as proposed by the applicant, with the appropriate mitigation, monitoring, and reporting conditions. The following describes the action area, activities involved with the habitat conservation project and proposed mitigation, monitoring, and reporting conditions.

The Woodard Bay NRCA, located within Henderson Inlet in southern Puget Sound, was designated by the Washington State Legislature in 1987 to protect a large, intact complex of nearshore habitats and related biological communities and to provide opportunities for low-impact public use and environmental education for the people of Washington. The site includes the former Weyerhaeuser South Bay Log Dump, which operated from the 1920s until the 1980s. The remnant structures from the log dump, including several hundred creosoted pilings, and a trestle and pier, continue to negatively impact nearshore ecosystems protected by the conservation area. Therefore, the WA DNR has proposed to remove these dilapidated structures to enhance the processes, functions, and structures of the nearshore ecosystems. However, a few of the remnant log booms from dumping operations have supported a healthy population of harbor seals for more than 30 years by providing haulout habitat. However, seals concentrate themselves and primarily haul out at only two locations within the NRCA (Figure 1).

Figure 1: Woodard Bay NRCA action area with haul-out locations.



The proposed project involves the removal of 615 creosote treated wood pilings and overwater creosoted structures (i.e. a trestle and pier superstructure) that are not associated with the booms seals use as a haulout (i.e., not within 30 yards (27 m) of the booms). For example, the piles within the red circle in Figure 2 will not be removed. Pile and structure removal would be accomplished using vibratory extraction, direct pull, and/or diver cutting techniques. The vibratory hammer is a large steel device suspended by a cable from a crane that is stationed on a barge adjacent to the piling. The pile is then lifted out of the water and placed on a barge.

Figure 2: Example of Piling Field and Haul-out Area in Henderson Inlet.



Approximately 615 12-24 inch diameter pilings would be removed with an average of 30 pilings removed per day via vibratory hammer extraction methods. Typically the hammer vibrates for less than one minute per pile, so there would be no more than 30 minutes of hammer vibration over an 8-hour period. After the pile is broken free of the sediment via vibration, a choker is used to lift the pile out of the water where it is placed on the barge for transport to an approved disposal site. If a pile breaks during extraction, ideally it would do so below the mudline; however, if a pile is broken above the mudline, then a choker is set on the broken pile and a diver cuts the pile at the mud line with a chainsaw so that it may be brought up to the barge by crane. Operations would begin on the pilings and structures that are furthest from the seal haul-out so that there is an opportunity for the seals to adjust to the presence of the contractors and their equipment. Vibratory extraction operations could occur for approximately 21 days over the 4-month work window (November 1 and February 28). Other work days would be spent removing pilings associated with the trestle, which is over 850 m from the closest haulout, and pier superstructure.

The portion of the Chapman Bay Pier that would be removed is more than 100 yards (91 m) from the closest haul-out area (Figure 1). This activity is expected to take a maximum of 10 days and, although does not involve vibratory extraction, has the potential to result in behavioral harassment due to the close proximity to working crew. In contrast, the Woodard Bay trestle is located on the other side of a peninsula that separates Woodard and Chapman Bays and is a

distance of more than 850 yards (777 m) from the closest haulout area. Work here is expected to take a maximum of 10 days to complete. Because of the distance from the haul-outs, the DNR anticipates structure removal at the Woodard Bay trestle would not disturb the seals. As such, 10 out of the 40 work days are not expected to result in harbor seal harassment.

Approximately 25 purple martin nest boxes would be relocated from the removed piles to the pilings that support or surround the haul-out area. This activity would only require a battery powered drill, is expected to take 2 days, and could also result in flushing the seals from the haulout. Crew would be required to complete this activity during the days when they are already working within 100 yards (91 m) of the haulout, possibly using a separate boat, so that no additional work days near the haulout are necessary. Presence of crew relocating nest boxes may result in behavioral harassment of seals. However, because this would be completed in tandem with pile removal, no substantial additional harassment is anticipated.

There is a paucity of data on airborne and underwater noise levels associated with vibratory hammer extraction. As background, in-air noise levels are referenced to 20 microPascals (re: 20 μPa) while underwater noise levels are referenced to one microPascal (re: 1 μPa). Based on information on airborne source levels measured for vibratory steel and concrete pile driving, removal of wood piles is unlikely to produce in-air sound pressure levels exceeding 90 dB_{rms} re: 20 μPa . The DNR and NMFS could not find hydroacoustic data on vibratory extraction of wood piles; however, it can be assumed that this activity does not result in SPLs above those produced during vibratory hammering. However, data are also lacking on vibratory hammering of wood piles. NMFS could only find data on driving timber piles using an impact hammer and vibratory driving non-timber piles. For example, the California Department of Transportation (Caltrans) indicates impact driving 12- or 14-inch wood piles typically emits peak source levels of 177 dB re: 1 μPa (Caltrans, 2009). Vibratory pile driving 12-24 inch steel piles typically results in SPLs around 155-165 dB re: 1 μPa (root mean square) ten meters from the source (Caltrans, 2007). It should be noted driving steel piles likely results in higher sound pressure levels (SPLs) than driving wood piles. Similarly, it is generally assumed that vibratory extraction emits lower SPLs than impact hammering wood piles or vibratory pile driving steel piles. NMFS anticipates source SPLs would not reach or exceed 155 dB re: 1 μPa . Therefore, while no hydroacoustic monitoring is planned for this project, sound pressure levels will not approach NMFS' threshold for Level A (injurious) harassment of pinnipeds (190 dB), and no injury or mortality of pinnipeds is anticipated or authorized.

CHAPTER 3 AFFECTED ENVIRONMENT

This chapter presents baseline information necessary for consideration of the alternatives, and describes the resources that would be affected by the alternatives, as well as environmental components that would affect the alternatives if they were to be implemented. The effects of the alternatives on the environment are discussed in Chapter 4.

3.1 SOCIAL AND ECONOMIC ENVIRONMENT

Economic and social factors are listed in the definition of effects in the NEPA regulations. However, the definition of human environment states that “economic and social effects are not intended by themselves to require preparation of an EIS.” An EA must include a discussion of a proposed action’s economic and social effects when these effects are related to effects on the natural or physical environment.

The NRCA provides a resource safe-haven and recreational area for Washingtonians and visitors. The area also provides for local tribal cultural preservation; however, this is specific to salmon acquisition. The NRCA does not support marine mammal watching companies nor is there subsistence use of marine mammals within the action area. Recreational use of the NRCA is low in winter (unfavorable weather) and fewer seals use the area during the work window. Further, seals are not expected to flee or abandon the area. Therefore, any recreational seal watching will not be significantly affected. In summary, there are no significant social or economic impacts interrelated with natural environmental effects from the proposed action.

3.2 PHYSICAL ENVIRONMENT

Woodard Bay NRCA is a natural reserve in Olympia, Washington protected under the Washington Natural Areas Program. Once an important processing facility for the logging industry, it has been designated as the Weyerhaeuser South Bay Log Dump Rural Historic Landscape. The 600 acres (2.4 km²) of the NRCA features a maturing second-growth forest edging five miles (8 km) of shoreline at Woodard and Chapman bays on Henderson Inlet. The shallow, saltwater bays are largely undeveloped and has attracted wildlife not usually seen so close to an urban area.

3.2.1 *Essential Fish Habitat*

Essential Fish Habitat (EFH) means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purpose of interpreting the definition of EFH, “waters” include aquatic areas that are used by fish and their associated physical, chemical, and biological properties and may include areas historically used by fish where appropriate; “substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities; “necessary” means the habitat required to support a

sustainable fishery and a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species’ entire life cycle.

In July, 2004, NMFS concluded consultation with the WA DNR pursuant to the Magnuson-Stevens Fisheries Management Conservation Act (MSFMCA). NMFS determined that the habitat restoration project, including pile removal, will not result in an adverse impact on EFH and impacts to the species protected under the MSFMCA are not expected to be detrimental. The proposed action is not reasonably expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the MSFMCA and identified in Fishery Management Plans.

3.2.3 Designated Critical Habitat

The ESA mandates the Federal government to designate “critical habitat” for every listed species. Critical habitat is an area deemed essential to the conservation of a species listed under the ESA. A critical habitat designation does not prohibit development activities, but rather, acts as a reminder to Federal agencies that important characteristics of an area must be protected. No marine mammal critical habitat has been designated within the action area; however, critical habitat does exist in the project area for the Puget Sound evolutionarily significant unit (ESU) of Chinook salmon. Potential impacts to this critical habitat were analyzed under a programmatic biological opinion on the effects of implementing actions proposed to be funded or carried out by the NOAA Restoration Center in the Pacific Northwest, prepared by the NMFS Northwest Regional Office. In this opinion, NMFS concludes that the proposed actions are not likely to jeopardize the continued existence of 21 species, including Chinook salmon; therefore, critical habitat will not be discussed further here.

3.3 BIOLOGICAL ENVIRONMENT

The Woodard Bay NRCA provides habitat for shorebirds and songbirds, harbor seals, river otters, bald eagles, a maternity colony of bats, and one of the most significant heron rookeries in the state. NMFS’ action of issuing an IHA would allow for the harassment of marine mammals and therefore is the focus of this section.

Harbor Seals

Harbor seals are the only marine mammal found within the action area. Harbor seals within the Woodard Bay NRCA belong to the Washington Inland Waters stock, which was estimated around 14,612 individuals in 2003 (NMFS, 2003). Although the stock assessment has not been updated since 2003, based on trends of other harbor seal stocks on the west coast, this is likely an underestimate. Based on the analyses of Jeffries et al. (2003) and Brown et al. (2005), both the Washington and Oregon coastal harbor seal stock have reached carrying capacity and are no longer increasing. Harbor seals are not listed as depleted under the MMPA or as endangered or threatened under the ESA. They are considered the most abundant resident pinniped species in Puget Sound (Lance and Jeffries, 2009).

Harbor seals haul out on rocks, reefs, beaches, and drifting glacial ice and feed in marine, estuarine, and occasionally fresh waters. Harbor seals generally are non-migratory, with local movements associated with such factors as tides, weather, season, food availability, and reproduction. They display strong fidelity for haulout sites (Pitcher and Calkins, 1979; Pitcher and McAllister, 1981). The remnant log booms at the Woodard Bay NRCA support a year-round population of harbor seals. The seals use the boom structures for haul-out habitat to rest, pup, and molt in two primary locations; to the east and to the north of the Chapman Bay Pier (see Figure 1). Haulout behavior is shown to be affected by time of day and tide cycle, as well as seasonal and weather patterns such as air temperature, wind speed, cloud cover, and sea conditions (Buettner et al., 2008). Annually, use of the log booms peaks from July, when females haul out to give birth to their pups, through October, during the late pupping season and molt (WA DNR, 2002).

The harbor seal population within the NRCA is considered one of the healthier ones in southern Puget Sound. Seal numbers have been monitored at the site since 1977, when there were less than 50 seals (e.g., Calambokidis et al., 1991; Buettner et al., 2008). In 1996, the highest count year, there were 600 seals. The average maximum annual count between 1977 and 2008 was 315 seals with 410 counted in August of 2008 (Buettner et al., 2008). Seal abundance declines in the winter (when work would occur); however, no direct counts are available as seal research ceases in October. Regardless, the number of seals that will be present during the project is much lower than during the pupping or molting periods.

Pinnipeds produce a wide range of social signals, most occurring at relatively low frequencies (Southall et al., 2007), suggesting that hearing is keenest at these frequencies. Pinnipeds communicate acoustically both on land and in the water, but have different hearing capabilities dependent upon the medium (air or water). Based on numerous studies, as summarized in Southall et al. (2007), pinnipeds are more sensitive to a broader range of sound frequencies underwater than in air. Underwater, pinnipeds can hear frequencies from 75 Hz to 75 kHz. In air, the lower limit remains at 75 Hz but the highest audible frequencies are only around 30 kHz (Southall et al., 2007).

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter represents the scientific and analytic basis for comparison of the direct, indirect, and cumulative effects of the alternatives. Regulations for implementing the provisions of NEPA require consideration of both the context and intensity of a proposed action (40 CFR Parts 1500-1508).

4.1 EFFECTS OF ALTERNATIVE 1: No Action

Under the No Action Alternative, NMFS would not issue an IHA to the DNR; therefore, mammals would not be authorized to be harassed incidental to activities associated with Woodard Bay habitat restoration project. NMFS assumes that, if no IHA is issued, mitigation and monitoring measures would not occur if the activity were to take place. Therefore, harassment would not be minimized, would be illegal, and impacts to seals would be unknown.

4.2 EFFECTS OF ALTERNATIVE 2: Issue IHA with proposed conditions

Issuance of the IHA would allow for the harassment of harbor seals incidental to the habitat restoration project and the DNR would comply with the proposed mitigation and monitoring measures described in Chapter 2 and Chapter 4. In consideration of the specified activity and implementation of these conditions, NMFS anticipates that short term harassment would cause temporary changes in harbor seal behavior, including flushing from the log booms; however, these behavioral changes would have a negligible impact on the population. The DNR and other organizations, such as the Cascadia Research Collective, have been monitoring the behavior of harbor seals in response to disturbance within the action area since 1977. In addition, the DNR has conducted other types of restoration work in the past and observed harbor seal behavior in response to those activities. Therefore, a large data set exists for how these seals would likely react to presence of crew and activities associated with the currently proposed habitat restoration project.

Past disturbance observations at Woodard Bay NRCA have shown that seal harassment occurs from non-motorized boats (e.g., recreational kayaks and canoes), motorized vessels (e.g., fishing boats), and people walking by the haulout (Calambokidis et al., 1991; Buettner et al., 2008). Calambokidis et al. (1991) found that the mean distance that seals entered the water in response to any type of vessel was 56 m. Most commonly seals were disturbed when vessels were 26 to 50 m from the haulout; however, only above 125 m was there a sharp decrease in the proportion of groups disturbed. Seals entered the water in response to people on foot at up to 256 m although, on many occasions, people were able to pass less than 100 m from seals, while maintaining a low profile without causing disturbance (Calambokidis et al., 1991). Furthermore, the distances that seals were disturbed varied significantly by vessel type; seals entered the water at a greater distance in response to kayaks and canoes compared to recreational motorboats and skiffs. It is hypothesized that because motor boats are more readily detectable than non-motorized boats, seals are more aware of their presence at greater distances and do not react as strongly (Buettner et al., 2008). Buettner et al. (2008) reported the research boat used during their study caused the greatest amount of harbor seal disturbance with the second and third highest causes being canoes and kayaks, respectively. The scientists theorized the most plausible reason for this is that the boats used for research came within the closest distance to the seals, often within 1m of the floats where seals were hauled out.

Buettner et al. (2008) also noted the difference in vigilance of seals based on float location during pupping season. For example, seals on floats located on the outer edges of the log boom area, and thus subjected to greater amounts of vessel traffic, were indifferent to vessels unless they closely approached the log booms. Contrarily, seals on the floats located in the central area of the log booms, and hence not exposed to as much traffic, were more vigilant and more sensitive to disturbances. Not surprisingly, the inner floats contained the highest amount of pups. The DNR would conduct the habitat restoration project from November to February, well outside of the pupping (and molting) season; therefore, there will be no impacts to seals during these biologically important time periods.

The two studies discussed above indicate that seals are susceptible to anthropogenic disturbance but also may habituate to such disturbances. During emergency maintenance operations on the haulout in 2008, which consisted of bringing in log booms to restore haul-out habitat and drilling through booms on a small barge, the seals present on the log booms flushed when the maintenance boat first entered the haulout area but quickly became accustomed to the contractor and the boat. Seals would rest on the same or adjacent boom to where maintenance operations were occurring. Seals initially flushed in response to onset of work but quickly acclimated to crew presence and would haulout on adjacent booms directly adjacent to the small barge used during maintenance. Furthermore, Suryan and Harvey (1991) found that harbor seals hauled-out at Puffin Island, WA, were more tolerant to subsequent harassments than they were to the initial harassment. However, sudden presence of a disturbance source (e.g., kayaker) can induce strong behavioral reactions.

To avoid inducing strong reactions, the WA DNR would conduct activities such that the piles farthest from the hauled out seals would be removed first; thereby avoiding a sudden disturbance and allowing seals time to acclimate to human activity. This would maximize the initial distance between maintenance crews and seals. The DNR believes that throughout the day, seals will become accustomed to crew presence of construction activities, as seen in previous disturbance studies within the Woodard Bay NRCA and other harbor seal populations. Furthermore, piles within 30 yards (27 m) of booms used as haul-out habitat will not be removed, avoiding extreme close approaches to these areas.

In addition to crew and vessel presence, hammer operations may disturb seals in-water; however, it is anticipated that most seals would be disturbed initially by physical presence. As discussed above, the DNR and NMFS could not find information on sound levels produced by timber pile extraction using a vibratory hammer; however, it is reasonable to assume that extraction would not result in higher SPLs than vibratory hammering. That is, NMFS anticipates that source levels in water would not reach or exceed 155 dB (the average source SPL for driving 12-24 inch steel piles). NMFS' general in-water harassment thresholds for pinnipeds exposed to non-pulse noise, such as those produced by vibratory pile extraction, are 190 dB rms re: 1 microPa as the potential onset of Level A (injurious) harassment and 120 dB rms re: 1 microPa at the potential onset of Level B (behavioral) harassment. These levels are considered precautionary and NMFS is currently revising these thresholds to better reflect the most recent scientific data. Vibratory extraction would not result in sound levels near 190 dB re: 1 microPa; therefore, injury would not occur. However, noise from vibratory extraction would exceed 120

dB re: 1 microPa near the source and may induce responses in-water such as avoidance or alteration of behavioral states at time of exposure.

There are limited data available on the effects of non-pulse noise on pinnipeds in-water; however, field and captive studies to date collectively suggest that pinnipeds do not strongly react to exposures between 90-140 dB re: 1 microPa; no data exist from exposures at higher levels (Southall et al., 2007). Jacobs and Terhune (2002) observed wild harbor seal reactions to high frequency acoustic harassment devices (AHD) around nine sites. Seals came within 44 m of the active AHD and failed to demonstrate any behavioral response when received SPLs were estimated at 120-130 dB re: 1 microPa. In a captive study (Kastelein, 2006), a group of seals were collectively subjected to data collection and communication network (ACME) non-pulse sounds at 8-16 kHz. Exposures between 80-107 dB re: 1 microPa did not induce strong behavioral responses; however, a single observation at 100-110 dB re: 1 microPa indicated an avoidance response at this level. The group returned to baseline conditions shortly following exposure. Southall et al. (2007) notes contextual differences between these two studies noting that the captive animals were not reinforced with food for remaining in the noise fields, whereas free-ranging subjects may have been more tolerant of exposures because of motivation to return to a safe location or approach enclosures holding prey items.

Hearing Impairment

Temporary or permanent hearing impairment is a possibility when marine mammals are exposed to very loud sounds. Hearing impairment is measured in two forms: temporary threshold shift (TTS) and permanent threshold shift (PTS). PTS is considered injurious whereas TTS is not as it is temporary and hearing is fully recoverable. There are no empirical data for onset of PTS in any marine mammal; therefore, PTS-onset must be estimated from TTS-onset measurements and from the rate of TTS growth with increasing exposure levels above the level eliciting TTS-onset. PTS is presumed to be likely if the hearing threshold is reduced by ≥ 40 dB (i.e., 40 dB of TTS). Due to the low source levels produced by vibratory extraction, NMFS does not expect that marine mammals will be exposed to levels that could elicit PTS; therefore, it will not be discussed further.

Temporary Threshold Shift (TTS)

TTS is the mildest form of hearing impairment that can occur during exposure to a loud sound (Kryter, 1985). While experiencing TTS, the hearing threshold rises and a sound must be louder in order to be heard. TTS can last from minutes or hours to, in cases of strong TTS, days. For sound exposures at or somewhat above the TTS-onset threshold, hearing sensitivity recovers rapidly after exposure to the noise ends. Few data on sound levels and durations necessary to elicit mild TTS have been obtained for marine mammals. Southall et al. (2007) considers a 6 dB TTS (i.e., baseline thresholds are elevated by 6 dB) sufficient to be recognized as an unequivocal deviation and thus a sufficient definition of TTS-onset. Because it is non-injurious, NMFS considers TTS as Level B harassment that is mediated by physiological effects on the auditory system; however, NMFS does not consider onset TTS to be the lowest level at which Level B harassment may occur.

Harbor seals within the action area are considered resident and may therefore be continually exposed to habitat restoration activities (however, recall that the vibratory hammer need only operate for approximately 1 minute to extract each pile). Sound exposures that elicit TTS in pinnipeds underwater have been measured in harbor seals, California sea lions, and northern elephant seals for broadband or octaveband (OBN) non-pulse noise ranging from approximately 12 minutes to several hours (Kastak and Schusterman, 1996; Finneran et al., 2003; Kastak et al., 1999; Kastak et al., 2005). Collectively, Kastak et al. (2005) analyzed these data to indicate that in the harbor seal, a TTS of ca. 6 dB occurred with 25 minute exposure to 2.5 kHz OBN with SPL of 152 dB re:1 microPa; the California sea lion showed TTS-onset at 174 dB re: 1 microPa (as summarized in Southall et al., 2007). Source levels emitted by vibratory pile extraction are low, intermittent, and would occur for a total of only 30 minutes per day. Further, seals may leave the area upon onset on vibratory pile extraction thereby reducing exposure duration. For these reasons, NMFS does not anticipate TTS would be induced.

Pilings to be removed do not provide any known habitat value to harbor seals (e.g., providing growth substrate for some food source). However, it is possible that pilings provide habitat or otherwise aggregate fish species that are prey for young harbor seals. As this project is not proposing to remove all pilings (e.g., approximately 60 pilings would remain near seal haul-outs and 750 pilings would remain as part of the Chapman Bay pier), these potential benefits will remain.

In summary, it is anticipated that seals would be initially disturbed by crew and vessels associated with the habitat restoration project; however, given the short duration and low energy of vibratory extraction, PTS would not occur and TTS is not likely. Those animals hauled out on the log booms would likely flush into the water; however, DNR would start with removal of piles farthest from the haulout. This methodology is designed to minimize disturbance as seals would have ample time to become alerted to and habituated to crew and vessel presence. As demonstrated in 2008, seals initially flushed into the water upon maintenance crew presence; however, quickly became accustomed to the contractor and the boat and would rest on the haul-out during maintenance operations. It is anticipated that harbor seals would react in a similar manner to pile and structure removal operations. For these reasons, harbor seals are expected to elicit short-term behavioral reactions (e.g., flushing) but no long term impacts (e.g., haul-out abandonment) are anticipated.

4.3 SUMMARY OF COMPLIANCE WITH APPLICABLE LAWS, NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

As summarized below, NMFS has determined that the proposed restoration project is consistent with the purposes, policies, and applicable requirements of the MMPA and NMFS regulations. NMFS issuance of the permit would be consistent with the MMPA.

4.3.1 *Endangered Species Act*

No marine mammals listed under the ESA occur within the action area. The Puget Sound ESU of Chinook salmon does occur in the project area; potential impacts to this species were analyzed under a programmatic biological opinion on the effects of implementing actions proposed to be

funded or carried out by the NOAA Restoration Center in the Pacific Northwest, prepared by the NMFS Northwest Regional Office. In this Opinion, NMFS concludes that the proposed actions are not likely to jeopardize the continued existence Chinook salmon. Therefore, additional Section 7 consultation under the ESA is not required.

4.3.2 *Marine Mammal Protection Act*

The applicant submitted an application which included responses to all applicable questions in the application instructions. The requested research is consistent with applicable issuance criteria in the MMPA and NMFS implementing regulations. The views and opinions of scientists or other persons or organizations knowledgeable of the marine mammals that are the subject of the application or of other matters germane to the application were considered, and support NMFS's initial determinations regarding the application.

4.4 MITIGATION AND MONITORING

As required under the MMPA, NMFS considered the DNR's proposed measures designed to effect the least practicable adverse impact on marine mammals and as well as monitoring and reporting procedures. These mitigation and monitoring measures would be included into the IHA.

DNR's specified activity does not have the potential to seriously injure or kill marine mammals and the chance of physically being injured by equipment is minimal. However, the DNR will carry out mitigation measures that are designed to eliminate potential for injury and minimize behavioral harassment to marine mammals. To ensure impacts and take do not exceed those expected and authorized, the DNR will conduct marine mammal monitoring before, during, and after pile removal activities.

The DNR has proposed mitigation measures designed to minimize disturbance to harbor seals within the action area in consideration of timing, location, and equipment use. Foremost, pile and structure removal will only occur between November and February, well outside harbor seal pupping and molting seasons. Therefore, no impacts to pups from the specified activity during these sensitive time periods will occur. The DNR will approach the action area slowly to alert seals to their presence from a distance and will begin pulling piles at the farthest location from the log booms used as harbor seal haulout areas. No piles within 30 yards (27 m) of a haulout will be removed. The contractor will be required to survey the operational area for seals before initiating activities, including cutting and removing pilings and structures, and to wait until the seals are at a sufficient distance (i.e., 30 yards (27 m)) from the activity so as to minimize the risk of direct injury from the piling or structure breaking free or equipment. DNR will also require the contractor to initiate a vibratory hammer "soft start" at the beginning of each work day. The "soft-start" method includes a reduced energy vibration from the hammer for the first 15 seconds and then a one minute waiting period. This method will be repeated twice before commencing with regular energy operations. Finally, the vibratory hammer power pack will be outfitted with a muffler to reduce in-air noise levels.

Seal monitoring and research has been occurring at Woodard Bay since the 1970's and has included seal ecology, population dynamics and disturbance behavior (Newby, 1970; Calambokidis et al., 1991; Buettner et al., 2008; Lambourn et al., 2009). DNR's monitoring plan adheres to protocols already established for Woodard Bay to the maximum extent practical for the specified activity. Monitoring of both haul-outs will be performed by at least one NMFS approved protected species observer (PSO) the first 2 days of project activities when the contractors are mobilizing and starting the vibratory hammer, during the 2 days when activities are occurring within 100 yards (91 m) of the haulout area, during five of the days of work on the Chapman Bay Pier, and for six other days during the 40-day work period to be decided when the project schedule is provided by the contractor. Therefore, there will be at least 15 days where a designated observer will be on site over the course of 40 days of work. The PSO will be onset prior to crew and vessel arrival to determine the number of seals present pre-disturbance. The PSO will maintain a low profile during this time to minimize disturbance from monitoring.

Observational data collected will include monitoring dates and time of monitoring and crew work, weather conditions, number of animals taken, behavioral reactions, and flushing or re-occupation times. The number of seals using the haul-out each monitoring day prior to the start of restoration activities, the number of seals flushed from the haulout, or, for animals already in the water, the number of animals that display adverse behavioral reactions to vibratory extraction, and type of activity occurring at time of disturbance will be recorded. A description of the disturbance source, the proximity in meters of the disturbance source, and reactions will also be noted. Total take for the project will be extrapolated by comparing the number of seals taken during monitoring hours versus the total number of days/hours restoration activities and correcting for effort. Within 30 days of the completion of the project, DNR will submit a monitoring report to NMFS that will include a summary of findings and copies of field data sheets and relevant daily logs from the contractor.

4.5 CUMULATIVE EFFECTS

Cumulative effects are defined those that result from incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or nonfederal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

The action area is a resource conservation area; therefore, there is little anthropogenic use of the area other than for recreational purposes and no development occurs here. Recreational use of the park has been known to result in seal disturbance (e.g., Calambokidis et al., 1991); however, the NRDC closely monitors park-goer use, erects marine mammal viewing guidance signs, and would intervene should persons be observed harassing animals. As described above, the population of harbor seals in the NRCA is healthy and increasing, demonstrating recreational use of the area is not hindering population growth.

The specified activity would not result in harassment beyond that incurred by the seals from presence of people using the park for recreation. Therefore, no significant cumulative impacts are anticipated. In addition, the DNR would avoid removing piles during sensitive

breeding times, when recreational use peaks. Therefore, there would be no cumulative impacts during the sensitive pupping season.

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