



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
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VIA ELECTRONIC FILING

December 8, 2008

Mr. Craig W. Collar
Senior Manager, Energy Resource Development
Public Utility District No.1 of Snohomish County
PO Box 1107
Everett, WA 98206 -1107

Subject: National Marine Fisheries Service's Comments on Snohomish County Public Utility District (PUD) No. 1 Pre-Application Document (PAD) for the Puget Sound In-Stream Tidal Power Projects, Federal Energy Regulatory Commission (FERC) Nos.12687, 12688, 12689, 12690, 12691, 12692, and 12698.

Dear Mr. Collar:

The National Marine Fisheries Service (NMFS) has reviewed Snohomish County PUD's Pre-Application Document for the proposed Puget Sound In-Stream Tidal Power Project and is providing the enclosed comments. Our comments are limited primarily to the selection of Admiralty Inlet, P-12690, as a proposed Pilot Project because this is the PUD's current focus.

The PUD should be aware that, based on the information NMFS has available now, Admiralty Inlet is a likely candidate for FERC to consider as a sensitive area, for many reasons explained in our enclosed comments. However, the PAD currently lacks information necessary to support an adequate assessment of the potential effects of the project on NMFS trust resources. After the PUD gathers this information, NMFS and others will be able to provide more detailed comments on the impacts of the proposed project on our trust resources. These comments should help inform FERC in deciding whether it is appropriate to use the pilot project licensing process for this project.

In the enclosed comments, NMFS has provided general information regarding the sensitivity of the proposed project area with respect to our trust resources. This information should assist FERC in deciding if the project is in a sensitive area. In summary, the proposed project is within the concentrated migration corridor or critical habitat of three salmonids listed as threatened or endangered under the Endangered Species Act (ESA), and three marine mammals listed as threatened or endangered under



the ESA. Critical habitat is listed for three of these species within the project boundaries. The proposed project is within essential fish habitat (EFH) for fishery resources Federally managed under three fishery management plans for Pacific groundfish, Pacific salmon, and coastal pelagics; and within EFH Habitat Areas of Particular Concern (HAPCs) for Pacific groundfish.

NMFS supports the concept of pilot hydrokinetic project development as a means to advance this nascent technology and gather information on the potential environmental impacts. Pilot projects can be effective in guiding future large-scale developments in an environmentally sound manner. At the same time, it is important to protect environmental resources during project development and operation.

This project in Admiralty Inlet raises concerns with respect to use of the pilot process: First, Snohomish County PUD proposes to site the project in what NMFS considers to be a sensitive area, it is in critical habitat, and EFH-HAPCs, as described more fully in our enclosed comments. Second, the PAD currently lacks an adequate assessment of potential effects on NMFS trust resources sufficient to support our environmental review. As explained in these comments, because of the current state of development of this project and the PAD, we can only provide general comments on potential impacts to our trust resources at this time.

During the ESA and EFH consultation processes, marine mammal permitting, and FERC's pilot project consultation process, NMFS will fully analyze the effect of the Admiralty Inlet Pilot Project on species listed under the ESA and their critical habitat, marine mammals, EFH and HAPCs, and other marine and estuarine species and their habitat. At this time, NMFS cannot predict the outcome of its analyses and conclusions in these consultations. The PAD provides a good starting point in acquiring the data needed to evaluate tidal technology and its potential impacts, but certain project details, data gaps, and study plan details need to be resolved as addressed in these comments.

Thank you for the opportunity to review and comment on this document. If you have questions regarding this document, please contact Alicia Bishop at 503-872-2854.

Sincerely,



for

Keith Kirkendall, Chief
FERC and Water Diversions Branch
Hydropower Division

Enclosure

cc: Service List

**National Marine Fisheries Service's Comments on
Snohomish County PUD's Pre-application Document for
Puget Sound In-Stream Tidal Power Projects**

December 8, 2008

I. General Comments

a. Background

NMFS appreciates the PUD's efforts to coordinate on development of their pilot project, and generally supports the development of pilot hydrokinetic projects as a means to gather information on the potential environmental impacts associated with this nascent technology. NMFS recognizes that pilot projects can be effective in guiding future large-scale developments in an environmentally sound manner.

Although the PAD covers multiple preliminary permit locations within Puget Sound under consideration by Snohomish County PUD for possible hydrokinetic development, NMFS is focusing our comments on Admiralty Inlet due to its selection for potential pilot installation. If and when Snohomish County PUD begins to develop plans for other hydrokinetic projects in Puget Sound, it needs to provide an updated PAD for our comment.

The PAD provides a good starting point in acquiring the data needed to evaluate tidal technology and its potential impacts, but lacks critical project and study plan details which need to be resolved before a pilot project can move forward. NMFS recognizes that the Snohomish PUD pilot project is in the initial stages of planning for the proposed action, and the design details have yet to be finalized. However, without knowing the exact location of the pilot project, the number of turbines to be deployed, the depth of turbine placement, the specific tidal in-stream energy conversion device, blade design and size, blade rotation rate, the subsea cabling method, site preparation for turbine installation, interconnection locations, and installation methods, NMFS can only provide general comments on potential impacts to NMFS trust resources. As greater details about the project develop, Snohomish County PUD needs to keep engaging NMFS during this process to provide guidance on the study and monitoring plans to address potential effects to ESA-listed species, EFH, marine mammals, and other marine and estuarine species, as well as their habitats.

In addition, Snohomish County PUD should provide a detailed operation and maintenance plan to the natural resource agencies for review and comment. Operation and maintenance impacts can vary by type, frequency and timing of the action. Potential impacts from maintenance activities may include degradation of nearshore water quality from biofouling removal and contamination from anti-fouling paints and their ability to induce immune suppression, reproductive impairment, or other physiological damage, as observed in several marine mammal species.

b. NMFS' Trust Resources

NMFS' trust resources within the area include species listed as endangered and threatened under the ESA, EFH designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and marine mammals protected under the Marine Mammal Protection Act (MMPA), as well as additional marine and estuarine resources, and marine and estuarine habitat. ESA-listed species within the boundaries of the proposed project are threatened Puget Sound Chinook salmon, threatened Puget Sound steelhead, threatened Hood Canal summer-run chum salmon, endangered Southern Resident killer whales (SRKW), threatened eastern stock of Steller sea lions, and endangered North Pacific humpback whales (Table 1). Critical habitat for listed fish and marine mammals, as defined in the ESA, is areas that have physical and biological features that are essential to the conservation of the species, and which may require special management considerations or protection. Three species' critical habitats exist in the project area, Puget Sound Chinook salmon (Figure 1), Hood Canal summer-run chum salmon (Figure 1), and SRKW (Figure 2). Snohomish PUD and FERC should consider information from, and be consistent with, the SRKW, Puget Sound Chinook salmon, and Hood Canal summer-run chum salmon Final Recovery Plans. Recovery criteria and goals identify threats to survival, site-specific management strategies and actions necessary to address the threats, cost estimates of the actions, and schedules for implementation.

Moreover, the project area is located within an area identified as EFH for various life stages of fish species managed with the following Fishery Management Plans (FMP) under the MSA:

- Pacific Groundfish FMP (PFMC 2005) – including many species of rockfish, flatfish, shark, and lingcod;
- Pacific Coast Salmon FMP (PFMC 2000) – Chinook salmon, coho salmon, and Puget Sound pink salmon; and
- Coastal Pelagics FMP (PFMC 1998) – including northern anchovy, Pacific sardine, and Pacific mackerel.

HAPCs, as provided in the EFH regulations, are types or areas of habitat within EFH that are identified based on one or more of the following considerations: the importance of the ecological function provided by the habitat; the extent to which the habitat is sensitive to human-induced environmental degradation; whether, and to what extent, development activities are or will be stressing the habitat type; or the rarity of the habitat type. For Pacific groundfish, estuaries, kelp beds, seagrasses, and rocky reefs are the HAPCs designated under the MSA within the project boundary (Figure 3).

In addition, Snohomish PUD should be advised that NMFS is conducting an ESA status review for five species of rockfish (Bocaccio, yelloweye rockfish, canary rockfish, greenstriped rockfish, and redstriped rockfish) which are all located within the potential pilot project waters. The one-year finding could result in a proposed listing for these species. In the coming weeks NMFS will make a determination regarding whether listing should be proposed for one or more of these species.

Table 1. ESA-listed species within the preliminary permit boundaries

Common Name	Scientific Name	Listing Status	Critical Habitat
Cetaceans			
Southern Resident killer whale	<i>Orcinus orca</i>	E - 11/18/2005; 70 FR 69903	11/29/2006; 71 FR 69054
North Pacific Humpback whale	<i>Megaptera novaeangliae</i>	E - 12/02/1970; 35 FR 18319	None designated
Pinnipeds			
Eastern Steller sea lion	<i>Eumotopias jubatus</i>	T - 5/5/1997; 62 FR 24345	8/27/1993; 58 FR 45269
Salmon			
Puget Sound Chinook salmon	<i>Oncorhynchus tshawytscha</i>	T - 6/28/05; 70 FR 37160	T 9/2/2005; 70 FR 52630
Hood Canal summer-run chum salmon	<i>O. kisutch</i>	T - 6/28/05; 70 FR 37160	T 9/2/2005; 70 FR 52630
Puget Sound Steelhead	<i>O. mykiss</i>	T - 5/11/07; 72 FR 26722	Under consideration

E = listed as endangered; T = listed as threatened

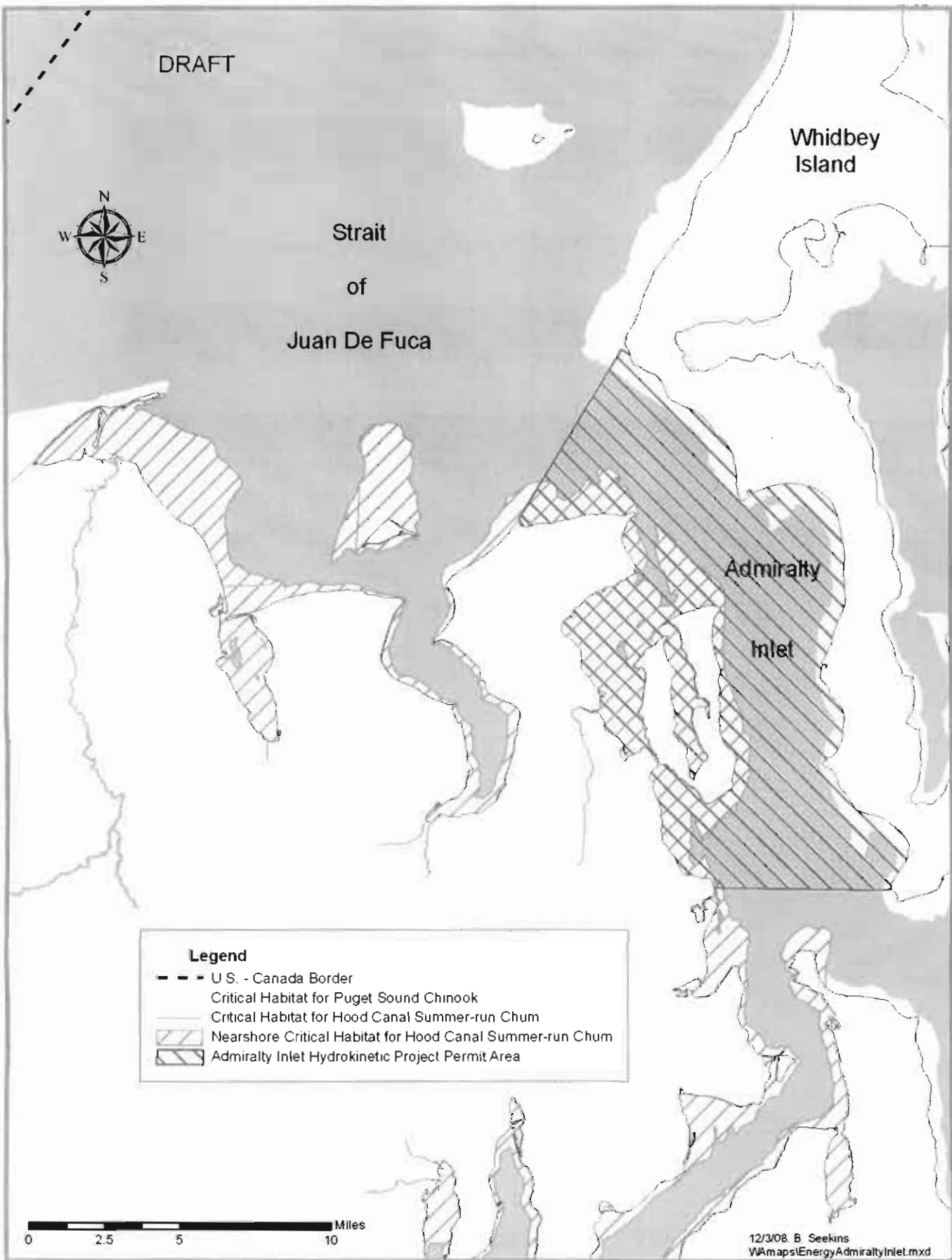
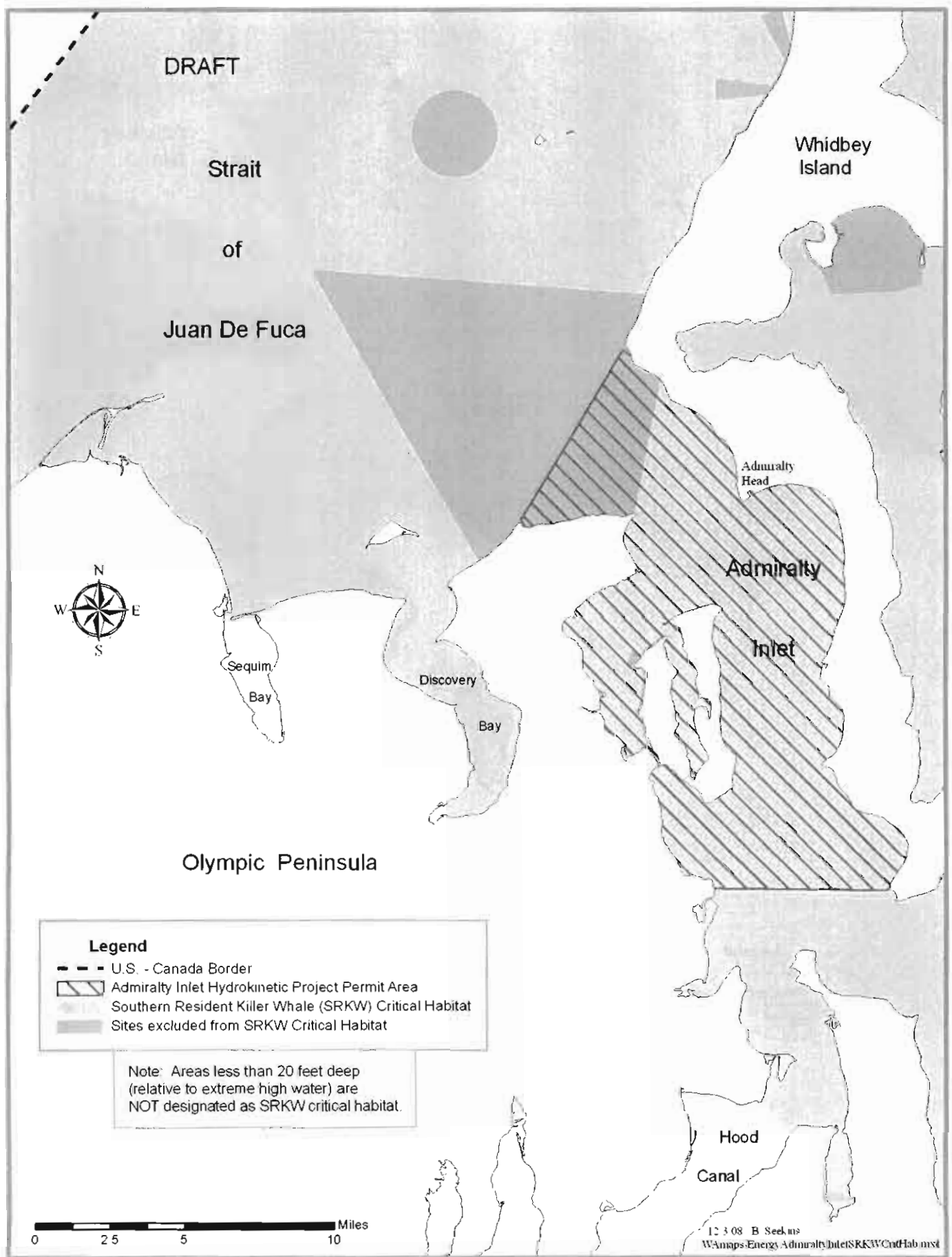


Figure 1. Salmon Critical Habitat within Preliminary Permit boundaries



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Figure 2. SRKW Critical Habitat within Preliminary Permit Boundaries



Figure 3. Habitat Areas of Particular Concern within Preliminary Permit Boundaries

c. Licensing Process and consultations required under other statutes

As proposed, FERC's six-month review period for completion of the licensing process does not provide sufficient time for FERC and NMFS to complete the statutorily mandated scientific review and consultation procedures according to time frames under existing laws and regulations. As noted above, NMFS is charged with implementing the ESA, MMPA, and the EFH provisions of the MSA, as well as other authorities. While we appreciate Snohomish County PUD's effort to engage in substantive discussions with the resource agencies at these early stages of the pilot project development, our consultations cannot begin until the FERC or Snohomish County PUD as FERC's non-Federal representative, submits the required information (e.g., Biological Assessment and EFH Assessment) needed to initiate consultation. NMFS expects that subsequent conversations with the PUD will further identify information needs for consultation purposes and that these information gaps will be addressed in the draft license application.

Additionally, Snohomish County PUD should be aware that under the MMPA if the project incidentally "takes" or "harasses" (defined broadly) marine mammals, the applicant must obtain a permit from NMFS or USFWS, depending on the impacted species. If short-term non-lethal impacts to marine mammals are anticipated, issuance of an "incidental harassment authorization" under the MMPA can take 4 months or longer from receipt of a complete application, while the rulemaking required for issuance of a "letter of authorization" to take marine mammals lethally or by serious injury typically requires between 7 and 18 months. Snohomish County PUD should be aware of these timelines, and recognize that certain activities can begin only after the authorization is granted.

During these consultations, NMFS will analyze the effect of the Admiralty Inlet Pilot Project on species listed under the ESA and their critical habitat, marine mammals, EFH and HAPCs, and other marine and estuarine species and their habitat. At this time, NMFS cannot predict the outcome of its analyses and conclusions in these consultations.

II. Specific Comments

a. Comments on Chapter 4 of the PAD

Pg 4-61 Admiralty Inlet: The list of marine mammals that may be present in the action area is incomplete. In addition to SRKW; gray whale, minke whale, harbor porpoise, and Dall's porpoise, several species of pinnipeds (harbor seal, California sea lion, Steller sea lion, and northern elephant seal) should be added, as well as transient killer whales and humpback whales, which are also known to occur at the entrance to Puget Sound.

Pgs 4-106-109: SRKW sighting data compiled from records collected by the Whale museum sightings data for the 15-year period from 1990-2005 show that killer whales were reported in the action area in all months of the year except May, June, and July. However, sightings were reported both to the north and south of Admiralty Inlet during May, June, and July, suggesting killer whales had passed through the action area during those months. This information should be added to the marine mammal sightings paragraph under 4.5.3.2.

Page 4-122 Table 4-42: All marine mammals are Federally protected under the MMPA regardless of ESA-listing status. This information should be added to the table.

Page 4-126 Table 4-44: The final Recovery Plans for the SRKW, Puget Sound Chinook salmon, and Hood Canal summer-run chum salmon and critical habitat designations have been completed. All of these documents are available on line at www.nwr.noaa.gov and should be added to the Relevant Recovery Plans and Status Reports column.

b. Project Suitability for the Pilot Project Process

In its White Paper, "Licensing Hydrokinetic Pilot Projects," FERC asserts:

These (pilot process) procedures are available on a case-by-case basis for individual hydrokinetic test projects that are proposed to be: (1) small; (2) short term; (3) not located in sensitive areas based on the Commission's review of the record; (4) removable and able to be shut down on short notice; (5) removed, with the site restored, before the end of the license term (unless a new license is granted); and (6) initiated by a draft application in a form sufficient to support environmental analysis.¹

FERC continues:

The applicant must describe potential areas of sensitivity in the proposed project area and indicate the reasons for the sensitivity. All stakeholders will have an opportunity both to comment on the applicant's description and to recommend that other areas be designated as sensitive. Commission staff will determine whether a potential use conflict makes the proposal inappropriate for an expedited review process. In many such cases, it will be possible for the applicant to pursue the project through a standard licensing process.

Snohomish County PUD identified several potential sensitive species within the proposed project area. However, they did not describe potential areas of sensitivity and indicate the reasons for the sensitivity which will be required in their draft license application as directed by FERC. In this absence, NMFS provides information in the following sections describing the sensitivity of the proposed project area. NMFS also provides information regarding the sufficiency of the applicant's PAD to support environmental review. Snohomish County PUD should include this information in its draft license application. NMFS is providing the information it has available to help determine the sensitivity of Admiralty Inlet for FERC's determination. As we have stated, additional information will help further consider the issue of whether this area is appropriate for use of the pilot project license process.

c. Sensitive Areas

As previously stated, NMFS has statutory authority over marine and anadromous resources, including ESA-listed species, their designated critical habitat, EFH, and HAPCs, all of which are within the Admiralty Inlet preliminary permit boundaries. Activities that occur within, and that affect, ESA-listed species, their designated critical habitat or HAPCs receive higher levels of

¹ FERC 2008. White Paper: Licensing Hydrokinetic Pilot Projects.

scrutiny from NMFS to ensure that impacts to these trust resources are avoided or minimized.² Admiralty Inlet contains critical habitat, EFH, and HAPCs.

Critical habitat within Admiralty Inlet for SRKWs, Puget Sound Chinook salmon, and Hood Canal summer-run chum salmon, should be a sensitive area for purposes of licensing a pilot hydrokinetic project because the project has the potential to impact primary constituent elements (important habitat features) of critical habitat for ESA-listed species in the project area. These nearshore marine habitat features include areas free of obstruction; having certain water quality and quantity conditions; and providing sufficient forage, including aquatic invertebrates and fishes that support growth and maturation.

According to the Puget Sound Salmon Recovery Plan, estuaries like Admiralty Inlet provide the transition zone that enables salmon to change from a fresh to a saltwater environment and back (NMFS 2007). Estuaries are also a rich source of food, provide places to hide from predators, give young salmon a safe harbor to grow strong for their ocean migrations, and are a key part of the migratory corridor salmon use to travel in and out of the rivers. This area is also important habitat for killer whales, other marine mammals and aquatic species. EFH, as defined in the MSA, is waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity. While the project area contains EFH which NMFS may consider sensitive, we will not address that issue until the draft license application stage when more project information is available to understand the effects of the project on EFH. HAPCs are areas that have particularly important habitat functions, are sensitive to degradation, could be subject to stress from development, or are rare. Admiralty Inlet is HAPCs, for many species of Pacific groundfish, and should be a sensitive area for purposes of pilot project licensing because it is not only necessary to these fish for their life functions; but may be particularly important, sensitive to degradation or subject to stress. The HAPCs in Admiralty Inlet include estuaries, kelp beds, seagrasses, and rocky reefs.

The proposed project is likely to alter the ecosystem of Admiralty Inlet. Construction and the addition of structures changes how the ecosystem functions. Combined, these changes affect migration corridors, transition of the fish from fresh to salt water, their eating habitats, and their ability to forage and seek refuge from predators. The changes could affect EFH, HAPCs, and critical habitat; impede, modify migration, or injure ESA-listed salmonids; injure marine mammals or alter their behavior and habitat utilization in Puget Sound. The breadth and magnitude of potential adverse impacts are currently unknown and cannot be evaluated without further project detail, research, and analysis.

NMFS agrees with FERC that pilot projects should be avoided in sensitive areas. However, as FERC also states in its White Paper, FERC staff will determine whether a potential use conflict makes it inappropriate to use the expedited review process. In this case, NMFS suggests that use of the expedited process may still be acceptable, pending collection and evaluation of the information requested below.

Further information regarding the designations applicable to NMFS' consideration of Admiralty Inlet as a sensitive area follows.

² FERC 2008. White Paper: Licensing Hydrokinetic Pilot Projects.

i. Critical Habitat

Admiralty Inlet serves as a critical migratory pathway for anadromous salmonids. Both out-migrating juveniles and returning adults pass through the preliminary project boundaries. Critical habitat for Puget Sound Chinook salmon and Hood Canal summer-run chum salmon within the project boundaries is the nearshore marine areas “contiguous with the shoreline from the line of extreme high water out to a depth no greater than 30 meters relative to mean lower low water” (NOAA 2005). NMFS defined the primary constituent elements (PCEs or elements of the physical and biological features essential to the conservation of the species) for nearshore marine areas as being free of obstruction; having certain water quality and quantity conditions; and providing sufficient forage, including aquatic invertebrates and fishes that support growth and maturation (NOAA 2005). Activities potentially affecting PCEs in this zone include (but are not limited to) construction and dredging (NOAA 2005). Considering that Snohomish County PUD anticipates placing turbines at a depth of 30-50m, the overlap between critical habitat boundary depths and potential turbine placement is potentially minimal, although within the depth distribution of salmonids. However, Snohomish County PUD should be aware that impacts outside the critical habitat boundary could still have negative effects on listed species within the boundary. Snohomish County PUD needs to consider the potential for direct take of listed species resulting from the pilot project. Snohomish County PUD should work with NMFS to consider sites that are outside of critical habitat and minimize impacts to critical habitat, and other habitats and species as well.

Critical habitat for the SRKW within the Admiralty Inlet project area consists of “all waters relative to a contiguous shoreline delimited by the line at a depth of 20 feet (6.1 m) relative to extreme high water” (NOAA 2006). This would encompass all waters deeper than 20 feet within the project area. The physical and biological features of the Southern Resident killer whale critical habitat are: (1) Water quality to support growth and development; (2) prey species of sufficient quantity, quality and availability to support individual growth, reproduction and development, as well as overall population growth; and (3) passage conditions to allow for migration, resting, and foraging (NOAA 2006). The proposed pilot project has the potential “to affect the PCEs by altering prey abundance, prey contamination levels, and passage between areas” (NOAA 2006). For example, vessels were identified as a potential “obstacle to whale passage, causing the whales to swim further and change direction more often, which potentially increases energy expenditure for whales and impacts foraging behavior” (NOAA 2006). Construction and operation practices for the pilot project could result in increased vessels within the critical habitat area. The potential turbine placement is well within the diving capabilities of the SRKW. Considering the small population size for the SRKW and the importance of every individual, Snohomish PUD should consider and analyze the potential of direct take, and impacts from prey reduction or prey contamination in connection with the pilot project development. In addition, the energy conversion devices themselves may affect migratory movements to and from Puget Sound.

ii. Essential Fish Habitat

NMFS designated Puget Sound as EFH for Pacific salmon including Chinook, coho, and Puget Sound pink salmon (PFMC 2000), and Pacific groundfish including rockfish, lingcod, and

Pacific cod (PFMC 2005), and coastal pelagic species including northern anchovy, Pacific sardine, Pacific mackerel, jack mackerel, and market squid species. All the marine waters out to the Exclusive Economic Zone with waters temperatures between 10°C to 26°C are considered EFH for coastal pelagic species (PFMC 1998). Specifically for the coastal pelagic species, Admiralty Inlet is EFH when temperatures are between 10°C to 26°C (PFMC 1998).

EFH may be particularly ecologically important or vulnerable to project effects based on information about substrate type, topography, and the occurrence of biogenic habitat, and NMFS will not consider potential impacts to EFH locations until additional information is provided in the draft license application. Estuary areas can be particularly sensitive and support numerous economically and ecologically important species, including juvenile lingcod and English sole. Some of the potential impacts to EFH from the pilot project might include disturbance, alteration, or destruction of habitat from anchor placement, subsea cabling, and general project operation and potential water quality impacts from stirring up contaminated sediments and releasing toxins back in the estuarine ecosystem.

iii. Habitat Areas of Particular Concern

NMFS designated certain parts of Puget Sound as HAPCs for groundfish, indicating their importance to the above-named species. HAPCs in the Admiralty Inlet area include estuaries, kelp beds, seagrasses, and rocky reefs. Designated HAPC include both geographic areas and habitat types. HAPCs based on habitat type may vary in location and extent over time. For this reason, the mapped extent of these areas offers only a first approximation of their location. Defining criteria are provided in the following descriptions of HAPCs, which can be used in conjunction with the map to determine if a specific location is within one of these HAPCs.

HAPCs defining criteria for the project area include:

Estuaries- The inland extent of the estuary HAPC is defined as MHHW, or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 ppt during the period of average annual low flow. The seaward extent is an imaginary line closing the mouth of a river, bay, or sound; and to the seaward limit of wetland emergents, shrubs, or trees occurring beyond the lines closing rivers, bays, or sounds. This HAPC also includes those estuary-influenced offshore areas of continuously diluted seawater. This definition is based on Cowardin et al. (1979).

Canopy Kelp- The canopy kelp HAPC includes waters, substrate, and other biogenic habitat associated with canopy-forming kelp species (e.g., *Macrocystis* spp. and *Nereocystis* sp.).

Seagrass- The seagrass HAPC includes those waters, substrate, and other biogenic features associated with eelgrass species (*Zostera* spp.), widgeongrass (*Ruppia maritima*), or surfgrass (*Phyllospadix* spp.).⁴

Rocky Reefs- The rocky reefs HAPC includes those waters, substrates and other biogenic features associated with hard substrate (bedrock, boulders, cobble, gravel, etc.) to MHHW. A first approximation of its extent is provided by the substrate data in the groundfish EFH assessment GIS. However, at finer scales, through direct observation, it may be possible to further distinguish between hard and soft substrate in order to define the extent of this HAPC.

Areas of interest are discrete areas that are of special interest due to their unique geological and ecological characteristics. The following area of interest is designated HAPC:

Off of Washington: All waters and sea bottom in state waters shoreward from the three nautical mile boundary of the territorial sea shoreward to MHHW. The Washington State waters HAPC encompasses a variety of habitats important to groundfish, including other HAPC such as estuary areas supporting numerous economically and ecologically important species, including juvenile lingcod and English sole, and sandy substrates within state waters are important habitat for juvenile flatfish. The proposed pilot project has the potential to affect water quality, tidal flow, and affect the quantity and quality of estuary, kelp, and seagrass habitats through the disturbance, alteration, or destruction of habitat from anchor placement, subsea cabling, and general project operation.

d. Decommissioning/Removal

As Snohomish County PUD continues to refine its proposal, NMFS recommends including a decommissioning or removal plan for the project at the end of the pilot license term or in the event of unacceptable environmental effects. FERC requires this in its White Paper on Licensing Hydrokinetic Pilot Projects. Since there should be no expectation on the part of the applicant that a transition to a traditional 30-50 year FPA license will be granted; a licensee should always expect to remove the project at the end of the pilot license term. In addition, because we have so little information on the environmental effects of these kinds of projects, it is important to be prepared to remove projects in case serious adverse environmental effects are found. The process and operations for complete removal and mitigation of the project and associated systems, as well as verification of financial capability to implement the process, should be incorporated into the pilot project license.

III. Study and Monitoring Plan Requests

Baseline information is needed as a reference point to enable NMFS to adequately assess project effects. Where baseline information is limited, the applicant should conduct studies for the first year or two of the license to gather baseline information before placing the pilot facility in the water. It is understood that Snohomish County PUD is not obliged to conduct studies prior to completion of the PAD. However, for this proposed pilot project, the PAD is insufficient in providing prior evaluation of the site and vicinity in terms of living resource uses and the establishment of baseline conditions. Snohomish County PUD is obligated to demonstrate, in advance of facility deployments, likely impacts to fish and wildlife known to use the proposed project site. This baseline data should be analyzed as part of the requisite site-specific NEPA analysis. This data will also be useful for the ESA section 7 and EFH consultations.

Study and monitoring protocols should focus on gathering the necessary information to inform current management decisions and those of future projects. Information gathered from studies and monitoring will help NMFS in our future management and regulatory decisions concerning potential project expansion, change in design, and/or appropriateness of a particular project site. Studies and monitoring should be directed to address case-specific questions.

Studies are needed to provide sufficient baseline (pre-construction) data to characterize existing environmental conditions and living marine resource utilization, and sufficient data to allow a thorough analysis of the impacts to living marine resources from the pilot project itself, as well as those that would be expected to result from project expansion and/or full scale development. NMFS recognizes that the Integrated Licensing Process includes criteria for study requests. However, it is too early in the process to follow these criteria, and we encourage a continuing open working relationship with Snohomish County PUD in developing study details. Our study requests provided below include a description of the information we need, and why we need it. Due to the novel nature of the project, at this stage in the process, it is more useful to work closely with Snohomish County PUD and other interested parties in developing the study methodology, than to recommend study methods independently. Additionally, given the preliminary stage of this application, this list likely does not encompass all NMFS concerns. Additional issues may arise as more information becomes available regarding the proposed project.

NMFS urges Snohomish County PUD to work closely with the resource agencies and other interested parties to develop and conduct the appropriate study methodologies to gather information needed to evaluate the environmental effects of the pilot project and alternatives to avoid or minimize the effects.

a. NMFS Pre-Installation Study Requests

NMFS requests the following baseline studies. The PUD should also follow up on the studies post-construction to compare pre- and post construction and operation conditions.

i. Collision Risk

NMFS is concerned that Southern Resident killer whales and other cetaceans may not be able to detect the turbine system and may subsequently collide or be struck by the blades. It is unclear if salmon will aggregate to the turbine array thereby attracting pinnipeds and cetaceans to feed and increasing the risk of marine mammal collisions with turbines. NMFS recommends developing and conducting a study to better understand the marine mammal and salmonid migratory pathways within the project area. Include a pre-installation micro-siting inventory of resident and migratory fish (vertebrates, invertebrates, crustaceans), wildlife (marine mammals, birds), and plants.

ii. General Local Habitat Alterations

Snohomish County PUD should conduct an initial habitat assessment (with special attention paid to the location of sensitive habitats) during the pre-installation micro-siting assessment. In order to determine the impacts from local habitat alteration, there needs to be an accurate depiction of what habitat types are currently located within (and surrounding) the micro-siting area. Pre-installation determination of habitat use (feeding, sheltering, migrating, resting, etc) by species that are likely to be present will be discussed in further detail in the altered use pattern section. The potential effects of the project on habitat within the turbine array need to be evaluated. In this study, Snohomish County PUD should include disturbance to benthic habitat associated with

laying cables, and creation of “new” habitat features (hard structure in water column, and benthic habitats). The biological and ecological significance of these changes to habitat are not understood, defining the need for this study. This study should collect information about the presence and type of habitat located within the project area prior to construction, and evaluate the potential effects (if any) of the project on these habitats following project deployment.

NMFS agrees with Snohomish County PUD that pre-installation surveys are needed along potential cable route in order to determine the location of sensitive habitats and avoid placement in those areas.

iii. Changes in Tidal Flow and Tidal Flushing

Operation of Tidal In-Stream Energy Conversion (TISEC) devices will extract energy from the water, which will reduce the velocity of currents in the near field of the project (Bryden et al. 2004). Rotors, foils, electric cables, and fixed structures will all act as impediments to water movement. The resulting reduction in water velocities could in turn, affect the transport and deposition of sediment, organisms living on or in the bottom sediments, and animals in the water column.

NMFS has concerns about the potential impacts of the project to the physical environments and ecosystems (e.g., affect currents and sediment transport). Prior to installation the site should be monitored through the implementation of a data-collection program. The data-collection program needs to be initiated pre-installation to supply the required depth surveys and preconstruction data on natural conditions that is needed for comparisons with the environmental changes that occur following construction (Boehlert et al. 2008). The extreme Pacific Northwest environment will place special demands on the TISEC devices, and it is important that the environmental responses be carefully documented.

Depending on local current characteristics, and the size and other qualities of the TISEC array, they could cause changes in current speed and direction as well as sediment transport and turbulence. This study needs to quantify contributions of current habitat to conditions in adjacent habitats (erosion/scour, sediment deposition effects, eddy formation, and related subsurface effects).

NMFS proposes a Current and Sediment Transport Study to provide an effective means to obtain site-specific data and evaluate, through associated modeling of acquired data, potential effects of the project on currents. This study should provide for collection of hydrologic measurements, velocity, direction, oxygen and nutrient concentration, seasonal variation and links to local weather pattern (baseline may be affected by weather variables and require manipulation of sample size. It is important to understand subsurface mixing, thermal and salinity affects from project installation, and so baseline information should be collected on these parameters. Sediment accretion studies should be conducted, including characterization of current accumulations and relationship to potential flow regime changes.

Results of the modeling can be used to predict project effects, if any, on sediment transport. This should include an analysis of water exchange rates and effects on water quality (contaminant and

effluent dilution rates etc.). The modeling should identify near-field effects of tidal turbine array, as well as monitoring to capture any anomalous effects. In the event that substantial effects on currents and sediment transport are observed, additional evaluation of effects on ecosystem processes may be warranted.

iv. Altered Use Patterns for Fish and marine mammals

The potential effects of the project on habitat within the turbine array need to be evaluated. In this study, Snohomish County PUD should evaluate disturbance to benthic habitat associated with laying cables, and creation of “new” habitat features (hard structure in water column, and benthic habitats). The biological and ecological significance of these changes to habitat are not understood, defining the need for this study. Snohomish County PUD should collect information about the presence and abundance of fish and invertebrates and habitat use (feeding, sheltering, migrating, resting, etc.) by species that are likely to be present in the project area prior to construction, and evaluate the potential effects (if any) of the project on these resources following project deployment. There may be seasonal fluctuations in usage patterns, so these assessments should be conducted over multiple seasons. Some species may be sessile, slow moving, highly mobile which will affect the degree to which they may be impacted by project installation. Organisms may graze on substrate or hunt mobile prey. Based on species likely to be present, Snohomish County PUD should derive a testable hypothesis of the potential reaction by these species to project installation and develop observations and sample size to test hypothesis. Considering that the TISEC device has yet to be chosen, the hypothesis may vary by type of equipment and structures to be tested. Hypothesis test results should, in the best case, support scaling to full build out and should include all seasons, surface, and sub-surface observations.

v. Accidental Contamination

The placement of TISEC devices within Admiralty Inlet has the potential to impact water quality. The placement of the turbine as well as subsea cabling methods could release contaminants into the water column and may cause bioaccumulation through the food web. NMFS recommends sampling the sediment to test for current chemical composition within the vicinity of the potential TISEC placement, and along the subsea cabling route, to determine the presence of any contaminants. Snohomish County PUD should measure near-bottom turbidity at a location proximal to an anchor deployment and the subsea cable route. Re-suspension of contaminated sediments and their potential impacts should be considered.

If toxic antifouling paints are used on the turbine structures, considerable pollution effects can be expected on the marine community within and beyond the location of the turbine array. Type and quantity of antifouling paint to be used on the project should be included within the draft license application.

vi. Electromagnetic Field Effects

The PAD mentions various transmission cable routes and mechanisms for installing them. More, but more details are needed to determine the impact of the transmission cable to NMFS’ trust resources. The configuration of the subsea cables may differ from traditional sources of

anthropogenic electromagnetic fields (EMF). Specifically, a single linear source of EMF from a subsea cable to shore may be replaced with a matrix of cables spanning the seabed under the turbine array. NMFS recommends further evaluating the potential for effects from EMF on the nearshore environment. The study should include pre-installation monitoring of ambient EMF at the site and post-installation monitoring, including the need for laboratory studies for sensitive species, as determined in consultation with natural resource agencies. EMF is of concern for NMFS because of the sensitivity of sharks, skates, rays, salmon, and green sturgeon, to a change in their environment related to migration and feeding. For these species, analyzing it is important to analyze effects of EMF and changes in their physical environment as well as direct impacts of EMF upon the animals themselves.

vii. Marine Noise

It is unclear what level of noise the TISEC device will produce during operation or the likely increase in noise in the area during construction. Thus, upon further clarification of the design details, Snohomish PUD should coordinate with the natural resource agencies about how to evaluate the likely noise impacts from the TISEC devices and the effects upon those resources. Considering that resident killer whales spend up to 50 to 67 percent of their time foraging, using echolocation, passive listening, and well developed vision to locate prey (NMFS 2006), NMFS is additionally concerned that noise impacts from turbine operation may affect whale feeding behavior. We agree with Snohomish PUD's assessment that hydroacoustic profiling is necessary pre- and post-deployment and during facility operations in order to determine the effect on ESA-listed species, EFH, and marine mammals. The studies should include monitoring marine mammal activity in parallel with sound level monitoring during construction and operation. Baselines sound surveys would be needed against which to measure the added effects of energy generation. It will be important to measure the acoustic characteristics produced by both single units and multiple units in an array, owing to the possibility of synchronous or asynchronous, additive noise produced by the array (Boehlert et al. 2008).

viii. Interference with Navigation, Fishing, and Marine Uses

Snohomish County PUD should conduct a pre-installation review of fisheries (commercial and recreational) that are located within Admiralty Inlet, (numbers of vessels, gear types, species harvested, depth, seasonality).

ix. Physical Disturbance of Seabed (subsea transmission cable and turbine installation)

The potential effects of the project on habitat within the turbine array need to be evaluated. In this study, Snohomish County PUD should include disturbance to benthic habitat associated with laying cables, and creation of "new" habitat features (hard structure in water column, and benthic habitats). The biological and ecological significance of these changes to habitat are not understood, defining the need for this study. Snohomish County PUD should collect information about the presence and abundance of fish and invertebrates in the project area prior to construction, and evaluate the potential effects (if any) of the project on these resources following project deployment.

NMFS agrees with Snohomish County PUD that pre-installation surveys are needed along potential cable route in order to determine the location of sensitive habitats and avoid placement in those areas. Post-installation surveys should be conducted to determine impacts from cable placement and determine if there is a temporary or permanent reduction in available foraging habitat and displacement of proximal habitat usage post installation. Turbine anchoring systems could alter the composition and pattern of sediment, and potentially alter the proximal landscape of the habitat near the anchor system. Snohomish County PUD should measure near-bottom turbidity at a location proximal to an anchor deployment and the subsea cable route. Re-suspension of contaminated sediments and their potential impacts should be considered.

b. NMFS Post- Installation Monitoring Requests

The studies listed below are based on information NMFS has available now. However, as stated earlier, NMFS may determine that there is a need for additional studies or information upon receipt and review of stakeholder comments, study requests, Snohomish County PUD's study plan, information derived from the studies, and your license application.

i. General Local Habitat Alterations

The potential effects of the project on habitat within the turbine array need to be evaluated. In this study, Snohomish County PUD should include disturbance to benthic habitat associated with laying cables, and creation of "new" habitat features (hard structure in water column, and benthic habitats). The biological and ecological significance of these changes to habitat are not understood, defining the need for this study. This study should evaluate the potential effect of the project on these habitats following project deployment. This study is a continuation of the pre-project habitat studies. It is necessary to know the habitat features before and after project installation and operation to determine the effect of the project on habitat.

NMFS agrees with Snohomish County PUD that post-installation surveys are needed along potential cable route in order to determine impacts from construction.

ii. Collision Risk

NMFS recommends further discussion and evaluation of the impacts to marine species from the operation of the TISEC devices. The final technology determination has not been made, and thus, the impacts to fish, invertebrates, and marine mammals are unclear at this point. However, preliminary concerns include the entrapment or impingement of individuals within the TISEC device whether caused by their own volition or through unavoidable current speeds. In addition, strikes and fish kills from turbine blades should be evaluated. If a screening mechanism is to be considered, NMFS should be involved in the design discussions to avoid and minimize effects to marine organisms.

Admiralty Inlet had the second-highest observation total of marine mammal sightings and the greatest diversity of species sightings within Snohomish County PUD's preliminary permit sites. NMFS is concerned that SRKWs and other cetaceans may not be able to detect the turbine system and may subsequently collide or be struck by the blades. It is unclear if salmon will

aggregate to the turbine array thereby attracting pinnipeds and cetaceans to feed and increasing the risk of marine mammal collisions with turbines. NMFS recommends developing a study to better understand the marine mammal migratory pathways within the project area, and how they behave in the presence of the project. Understanding the occurrence of the individuals and any effects from noise or other disturbances should be fully considered and evaluated.

iii. Changes in Tidal Flow and Tidal Flushing

Operation of TISEC devices will extract energy from the water, which will reduce the velocity of currents in the local area. This loss of current energy could, in turn, alter sediment transport. NMFS suggests including data collection in support of modeling altered sediment deposition rates related to reduced tidal flow velocities associated with current pilot project and potential full-scale build out. This study should include an analysis of water exchange rates and effects on water quality (contaminant and effluent dilution rates etc.). Snohomish County PUD should identify near-field effects of tidal turbine array, as well as monitoring to capture any anomalous effects.

iv. Altered Use Patterns for Fish and Marine Mammals

If marine species are successful in detecting the project infrastructure, there is still potential concern over the effects from altering their migration route to avoid the project. NMFS recommends developing a study to better understand the marine mammal and salmon migratory pathways within the project area, and how they behave in the presence of the project. Snohomish County PUD should fully consider and evaluate all effects from noise, cavitation, or other disturbances on aquatic species to allow an understanding the effects on individuals and habitat use.

v. Electromagnetic Field Effects

The PAD mentions various transmission cable routes and mechanisms for installing them. More details are needed to determine the impact of the transmission cable to NMFS' trust resources. The configuration of the subsea cables may differ from traditional sources of EMF. Specifically, a single linear source of EMF from a subsea cable to shore may be replaced with a matrix of cables spanning the seabed under the turbine array. NMFS recommends further evaluating the potential for effects from EMF on the nearshore environment. The study should include pre-installation monitoring of ambient EMF at the site and post-installation monitoring, including the need for laboratory studies for sensitive species, as determined in consultation with natural resource agencies. EMF is of concern for NMFS because of the sensitivity of sharks, skates, rays, salmon, and green sturgeon, to a change in their environment related to migration and feeding. For these species, it is important to analyze effects of EMF and changes in their physical environment, as well as direct impacts of EMF upon the animals themselves.

vi. Marine Noise

It is unclear what level of noise the TISEC device will produce during operation or the likely increase in noise in the area during construction. Thus, upon further clarification of the design

details, Snohomish County PUD should engage with the natural resource agencies about the likely noise impacts from the TISEC devices and the effects upon those resources. Considering that resident killer whales spend up to 50 to 67 percent of their time foraging, using echolocation, passive listening, and well developed vision to locate prey (NMFS 2006), there is additional concern that noise impacts from turbine operation may affect whale feeding behavior. We agree with Snohomish County PUD's assessment that hydroacoustic profiling is necessary pre- and post-deployment and during facility operations in order to determine the effect on ESA-listed species, EFH, and marine mammals. The studies should include monitoring marine mammal activity in parallel with sound level monitoring during construction and operation. Baselines sound surveys would be needed against which to measure the added effects of energy generation. It will be important to measure the acoustic characteristics produced by both single units and multiple units in an array, owing to the possibility of synchronous or asynchronous, additive noise produced by the array (Boehlert et al. 2008).

vii. Physical Disturbance of seabed (subsea transmission cable and turbine installation)

The potential effects of the project on habitat within the turbine array need to be evaluated. In this study, Snohomish County PUD should include disturbance to benthic habitat associated with laying cables, and creation of "new" habitat features (hard structure in water column, and benthic habitats). The biological and ecological significance of these changes to habitat are not understood, defining the need for this study. This study should collect information about the presence and abundance of fish and invertebrates in the project area prior to construction, and evaluate the potential effects (if any) of the project on these resources following project deployment.

NMFS agrees with Snohomish County PUD that pre-installation surveys are needed along potential cable route in order to determine the location of sensitive habitats and avoid placement in those areas. Post installation surveys should be conducted to determine impacts from cable placement and determine if there is a temporary or permanent reduction in available foraging habitat and displacement of proximal habitat usage post installation. Turbine anchoring systems could alter the composition and pattern of sediment, and potentially alter the proximal landscape of the habitat near the anchor system. Snohomish County PUD should measure near-bottom turbidity at a location proximal to an anchor deployment and the subsea cable route. Re-suspension of contaminated sediments and their potential impacts should be considered.

viii. Biofouling

Snohomish County PUD needs to prepare and carry out a plan to address biofouling on the turbine structure. In particular, Snohomish County PUD needs to determine the need for an action to clean the structure of biofouling organisms, and if necessary, how it will keep the structure clean. Snohomish County PUD should evaluate the alternatives for cleaning in order to determine any effect upon habitat for NMFS' trust resources, as well as on the animals themselves. If anti-fouling paints are to be used, Snohomish County PUD should consider the effects of such toxic compounds in the nearshore environment, cleaning schedule, and reapplication schedule of the structure.

ix. Derelict gear and entanglement

NMFS is concerned that derelict fishing gear may snag on turbine structures, and in turn pose an entanglement risk to marine mammals, fish, and potentially marine birds. Not only would this kill the entangled animals, but it would draw predators to the turbines, increasing the number of animals that would be affected. Snohomish should consider conducting underwater inspections every 90 days on the TISEC devices for entangled marine debris.

IV. Conclusion

As stated above, the potential pilot project would be located within the range of protected species and within sensitive area(s). Because of this the proposed project could: alter the ecosystem of Admiralty Inlet; affect EFH, HAPCs, and critical habitat; impede, modify migration, or injure ESA-listed salmonids and other aquatic resources; injure marine mammals or alter their behavior and habitat utilization in Puget Sound. The proposed pilot project in Admiralty Inlet is critical habitat and HAPCs, and may be considered a sensitive area for purposes of pilot project licensing. Snohomish County PUD should describe the proposed project area, and provide reasons for the sensitivity in their draft license application, if appropriate.

Snohomish County PUD's PAD currently is insufficient to support NMFS' environmental review and consideration of the potential effects of the project on marine and estuarine fish, marine mammals, and their habitat. The draft license application needs to include more detailed information on the exact location of the pilot project, the number of turbines to be deployed, the depth placement of the turbines, the specific tidal in-stream energy conversion device, blade design and size, blade rotation rate, the subsea cabling method, site preparation for turbine installation, interconnection locations, and installation methods. The draft license application also needs to include the studies listed above, and clearly describe how study and monitoring will provide sufficient data to allow a thorough analysis of the impacts to living marine resources from the pilot project itself, as well as those that would be expected to result from project expansion and/or full scale development. Snohomish County PUD should include in their draft license application, project details, information gaps, and study plan details in sufficient manner to ensure that the proposed project will not adversely impact NMFS' marine and estuarine resources, including their habitats, in the Admiralty Inlet project area. Otherwise due to the potentially sensitive nature of this project location, NMFS will recommend that FERC not use the expedited pilot licensing process for this project. NMFS would also recommend use of the standard licensing process if the additional information shows the potential for significant harm to this sensitive area.

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**UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION**

Snohomish County Public Utility District No. 1

**FERC Project Nos. P-12687,
12688, 12689, 12690, 12691,
12692, and 12698**

CERTIFICATE OF SERVICE

I hereby certify that I have this day served, by electronic filing, the National Marine Fisheries Service's Comments on Snohomish County Public Utility District No. a Pre-Application Document for the Puget Sound In-Stream Tidal Power Projects, cover letter to Kimberly Bose, FERC, and this Certificate of Service upon each person designated on the official service list compiled by the Commission in the above captioned proceeding.

Dated December 8, 2008.


Debbie Clement

Document Content(s)

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