Appendix B: Agency Correspondence

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

July 29, 2010

Roger Roper
Deputy State Historic Preservation Officer
Oregon Parks and Recreation Department
State Historic Preservation Office
725 Summer Street NE, Suite C
Salem, OR 97301

Subject: Request for Opinion; Proposed Oregon State University Wave Energy Project, Newport, Oregon

Dear Mr. Roper:

This letter is to inform you that the U.S. Department of Energy (DOE) is preparing an Environmental Assessment (EA), in accordance with the National Environmental Policy Act (NEPA), for the proposed Northwest National Marine Renewable Energy Center (NNMREC) Mobile Ocean Test Berth (MOTB). The NNMREC is a DOE funded partnership between Oregon State University and University of Washington.

The proposed MOTB would be sited off the coast of Newport, Oregon (T. 10 N., R. 12 W., W.M). The analysis conducted pursuant to NEPA will cover a larger "Study Area" of approximately 2 X 3 miles in the Pacific Ocean. During final design a smaller 1 X 1 mile Test Site will be identified in which up to two MOTBs would be deployed. The final Test Site location is currently being determined through the NEPA and a site selection processes in conjunction with local governmental groups, the local community, and the Fisherman Interested in Natural Energy (FINE), a Newport fishing group. Each MOTB would be connected to one wave energy conversion (WEC) device. The MOTB would be capable of testing the output of a variety of wave energy conversion WEC devices without being connected to the electrical grid as a cost-effective means to evaluate the technical aspects, performance characteristics, and environmental impacts of developing marine renewable energy. One underwater sub-station pod (USP) may also be included in the facility and would be connected to both MOTBs and WEC devices.

The MOTB consists of a single-hull vessel, containing an adjustable load bank (ALB), submarine power cable, power analysis and data acquisition (PADA) unit, transformers,

and miscellaneous instruments and equipment. The hull would be approximately 14 feet wide by 32 feet long by 11 feet high and including equipment, would weigh approximately 45,000 pounds. The PADA measures the WEC device's output voltage and current waveforms with respect to time at high sampling rates. The ALB dissipates power generated from the WEC device by transforming it into heat that is dissipated into the ocean. Also included in the NEPA analysis is a USP, which enables the power take-off cables from multiple test berth modules and wave energy devices to be connected, and enables the power to be delivered back to shore via a single subsea cable.

The MOTB would likely be moored to an anchoring system on the sea floor consisting of a three-point mooring system with standard ship-type anchors (Stato anchors). The WEC devices would use a range of independent mooring and anchoring configurations depending on the device design; however, it is anticipated that they would also use a three-point mooring configuration. The MOTB and WEC device would be connected by a submarine power cable. The USP would also be moored to the sea floor during testing. The monitoring equipment would either be set on the sea floor (AWAC) or moored (Waverider, ADCPs, Plankton plates, etc.).

This project is the recipient of funding from the federal government, and requires a permit from the U.S. Army Corps of Engineers (Corps) for work in waters. The DOE is the lead Federal Agency responsible for compliance with Section 106 of the National Historic Preservation Act (NHPA). Pursuant to compliance with Section 106 of the NHPA, DOE is initiating consultation with your office regarding the proposed Area of Potential Effects (APE) for this wave energy project. Enclosed please find maps that illustrate the proposed APE for this project.

A record search was conducted at the State Historic Preservation Office (SHPO) in Salem, Oregon, in February of 2010. The records search was used to identify previously documented archaeological, historic, and architectural resources within, and directly adjacent to, the APE, and to help establish a context for developing expectations about potential resources within the study area. No cultural resource surveys have occurred in, or within one mile of, the APE. No archaeological sites or isolates were identified in, or within one mile of, the APE. In addition, an analysis of historic shipwreck locations along the Oregon Coast (Marshall 1984) indicated that no recorded wrecked ships are located within the APE.

Please provide any comments within 30 days of the stamped date on this letter to assist us in the development of the EA.

We look forward to hearing from you regarding this project. Please feel free to contact me by phone at 720.356.1322 or via email at laura.margason@go.doe.gov if you have any questions or comments.

Sincerely,

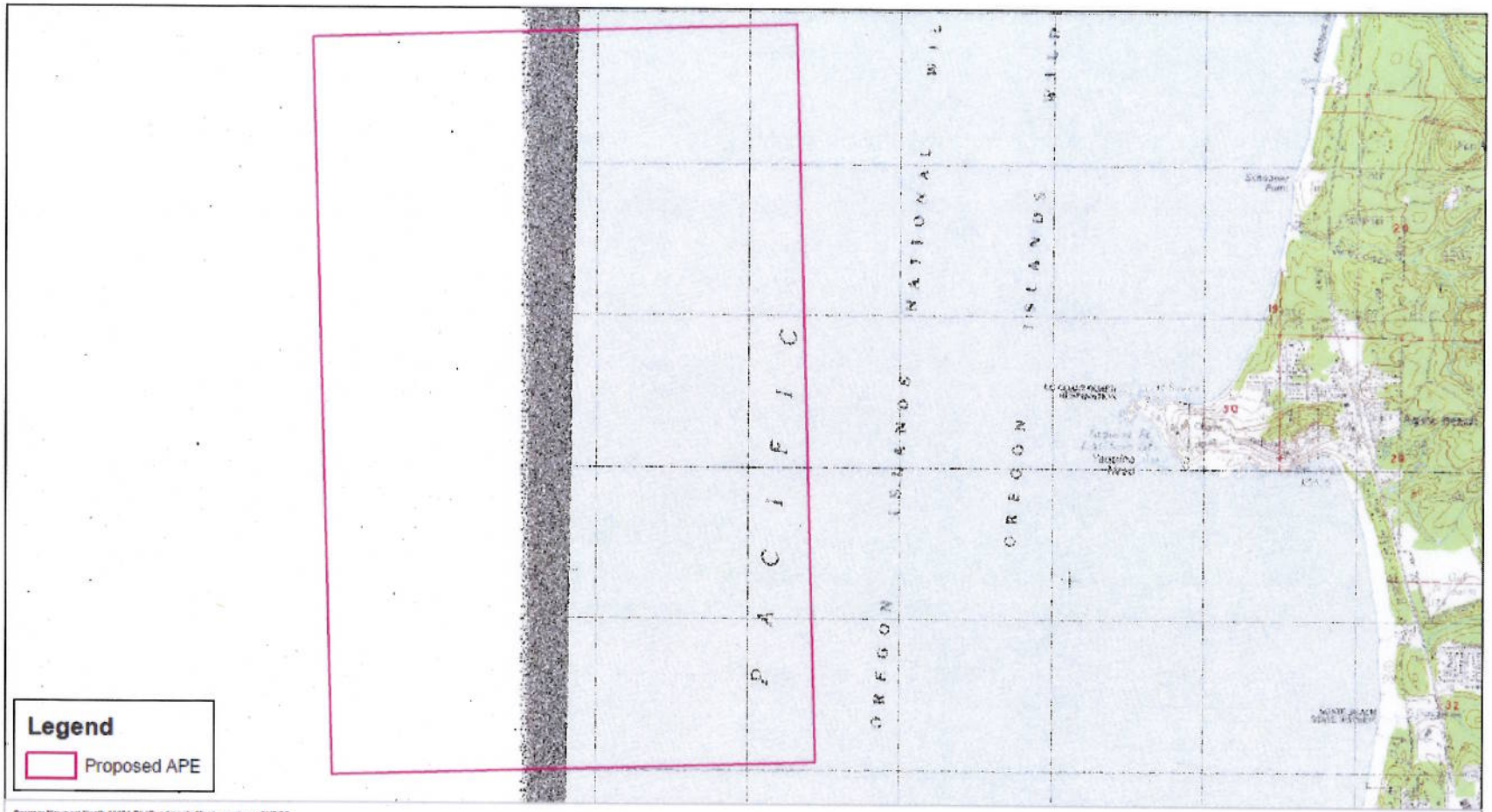
Laura Margason

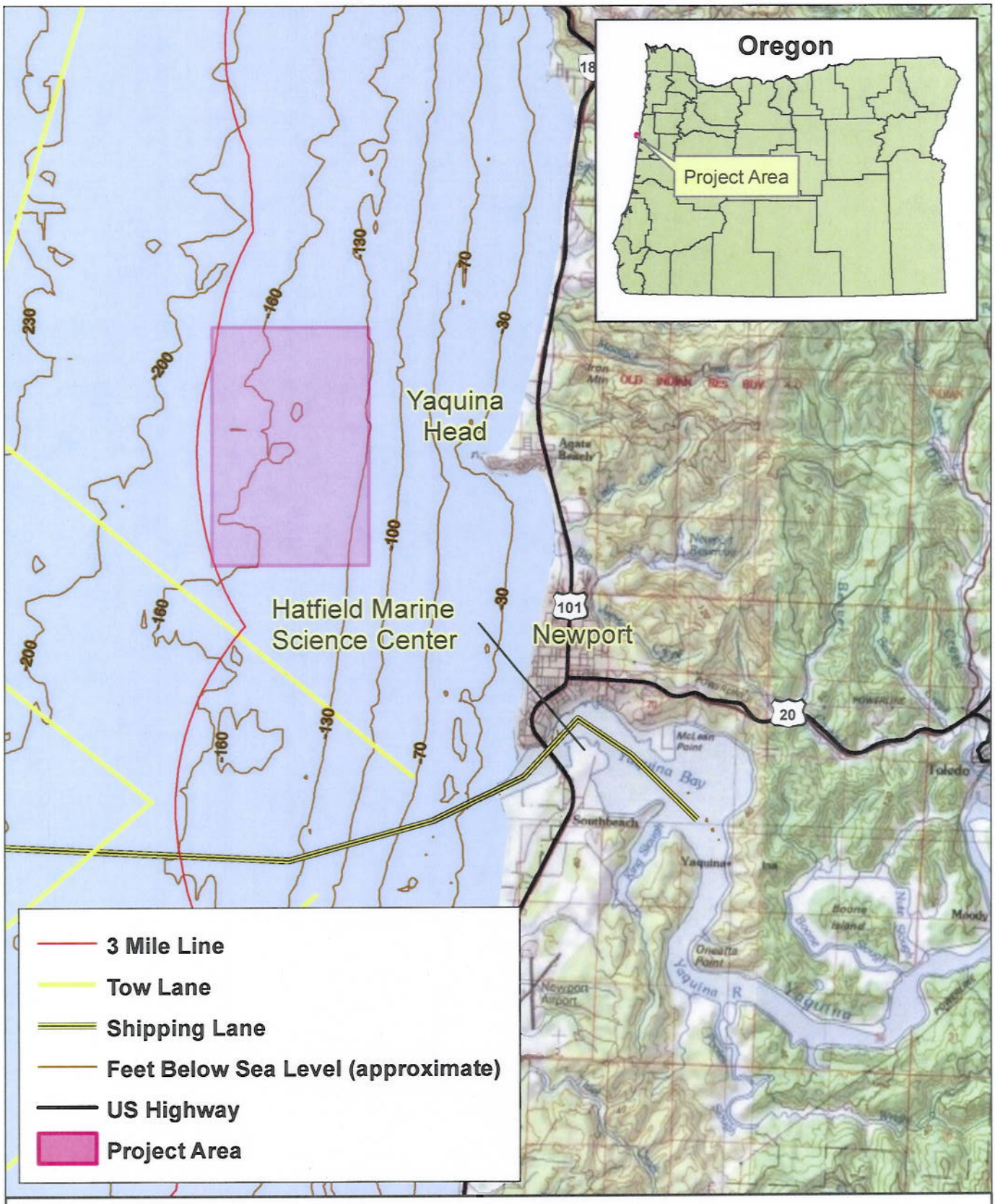
Laura Margason
NEPA Document Manager

Enclosures:

USGS 1:24,000 scale map Newport North, with project APE overlay
National Geographic Society TOPO (courtesy of ESRI) of MOTB Study Area

cc: Dr. Dennis Griffin, State Archaeologist


PACIFIC
OREGON ISLANDS NATIONAL WILDLIFE REFUGE
Legend
Proposed APE
Source: Newport North 44124-F1 (Quadrangle Map), courtesy of USGS
Meters 0 1,500 3,000
Feet 0 5,000 10,000
1:24,000
Oregon State University
Wave Energy
Proposed Area of Potential Effects
Map prepared by:
ICF
March 16, 2010



Source: National Geographic Society TOPO, courtesy of ESRI

Figure 2-1
Mobile Ocean Test Berth
Project Area

ICF INTERNATIONAL

Oregon
Theodore R. Kulongoski, Governor

Parks and Recreation Department
State Historic Preservation Office
725 Summer St NE, Ste C
Salem, OR 97301-1266
(503) 986-0671
Fax (503) 986-0793
www.oregonheritage.org

August 9, 2010

Ms. Laura Margason
DOE Golden Field Office
1617 Cole Blvd
Golden, CO 97401

RE: SHPO Case No. 10-1830
OSU Wave Energy Proj
10S 12W, Newport Lincoln County

Dear Laura:

Our office recently received your report about the project referenced above. I have reviewed your report and agree that the project will have no affect on any known cultural resources. No further archaeological research is needed with this project.

Please be aware, however, that if during development activities you or your staff encounters any cultural material (i.e., historic or prehistoric), all activities should cease immediately and an archaeologist should be contacted to evaluate the discovery. Under state law (ORS 358.905-955) it is a Class B misdemeanor to impact an archaeological site on public or private land in Oregon. Impacts to Native American graves and cultural items are considered a Class C felony (ORS 97.740-760). If you have any questions regarding any future discovery or my letter, feel free to contact our office at your convenience.

Dennis Griffin

Dennis Griffin, Ph.D., RPA
State Archaeologist
(503) 986-0674
dennis.griffin@state.or.us

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

June 19, 2012

Roger Roper
Deputy State Historic Preservation Officer
Oregon Parks and Recreation Department
State Historic Preservation Office
725 Summer Street NE, Suite C
Salem, OR 97301

Subject: Update regarding Proposed Oregon State University Wave Energy Project, Newport, Oregon

Dear Mr. Roper:

This letter is to provide you with an update on the U.S. Department of Energy (DOE) Environmental Assessment (EA), which is being prepared in accordance with the National Environmental Policy Act (NEPA), for the proposed Northwest National Marine Renewable Energy Center (NNMREC) Wave Energy Test Project. The NNMREC is a DOE funded partnership between Oregon State University and University of Washington.

In our letter dated July 29, 2010, DOE described the location where the proposed project would be sited, the components that would comprise the proposed project, and the specifications for those components. DOE's letter also described the record search that was conducted at the State Historic Preservation Office (SHPO) in Salem, Oregon, in February of 2010 and stated DOE's conclusion that no cultural, archeological, or historical sites are located within the area of potential effect (APE) for the proposed project. A figure illustrating the APE was enclosed in the 2010 letter and is also enclosed in this correspondence. In a letter dated August 9, 2010, the Oregon SHPO replied with their concurrence that the project would have no effects on known cultural resources.

At that time, it was anticipated that the Draft EA for the proposed project would be published in late 2010; however, the preparation of the Draft EA was postponed temporarily. During this time, NNMREC made minor changes to the proposed project. For example, these included changing the test apparatus (described as the Mobile

Ocean Test Berth or MOTB during scoping) from a 30- to 40-foot boat-shaped hull capable of testing loads up to 1 megawatt, to the Ocean Sentinel, a 6-meter NOMAD-shaped buoy capable of testing loads up to 100 kilowatts. The duration of deployments for the testing apparatus was shortened from 12 months to 3 to 6 months. The range of possible anchoring and mooring infrastructure was narrowed, and the standoff distance between the test buoy and the WEC device under test was decreased. The first WEC device (the WET-NZ device) to be tested at the project site was identified, though it fell within the parameters for likely WEC devices that would be tested as described in scoping. During scoping, the project site was defined as a 6-square-mile quadrant. Later, the project site was narrowed down to a 1-square-nautical-mile area within the original, larger site. DOE is presently revising the Draft EA to reflect all changes to the proposed Project and anticipates releasing the Draft EA in late June of 2012.

Because the specific location of site for the proposed project was refined to a smaller area within the original larger site and the activities that would take place as part of the proposed project are do not differ materially from those described during earlier consultation carried out pursuant to Section 106 of the National Historic Preservation Act, DOE believes that the SHPO's concurrence (letter dated August 9, 2010) also applies to the project in its current form.

If you have any questions or comments regarding this project, please feel free to contact me by phone at 720.356.1322 or via email at laura.margason@go.doe.gov.

Sincerely,

Laura Margason

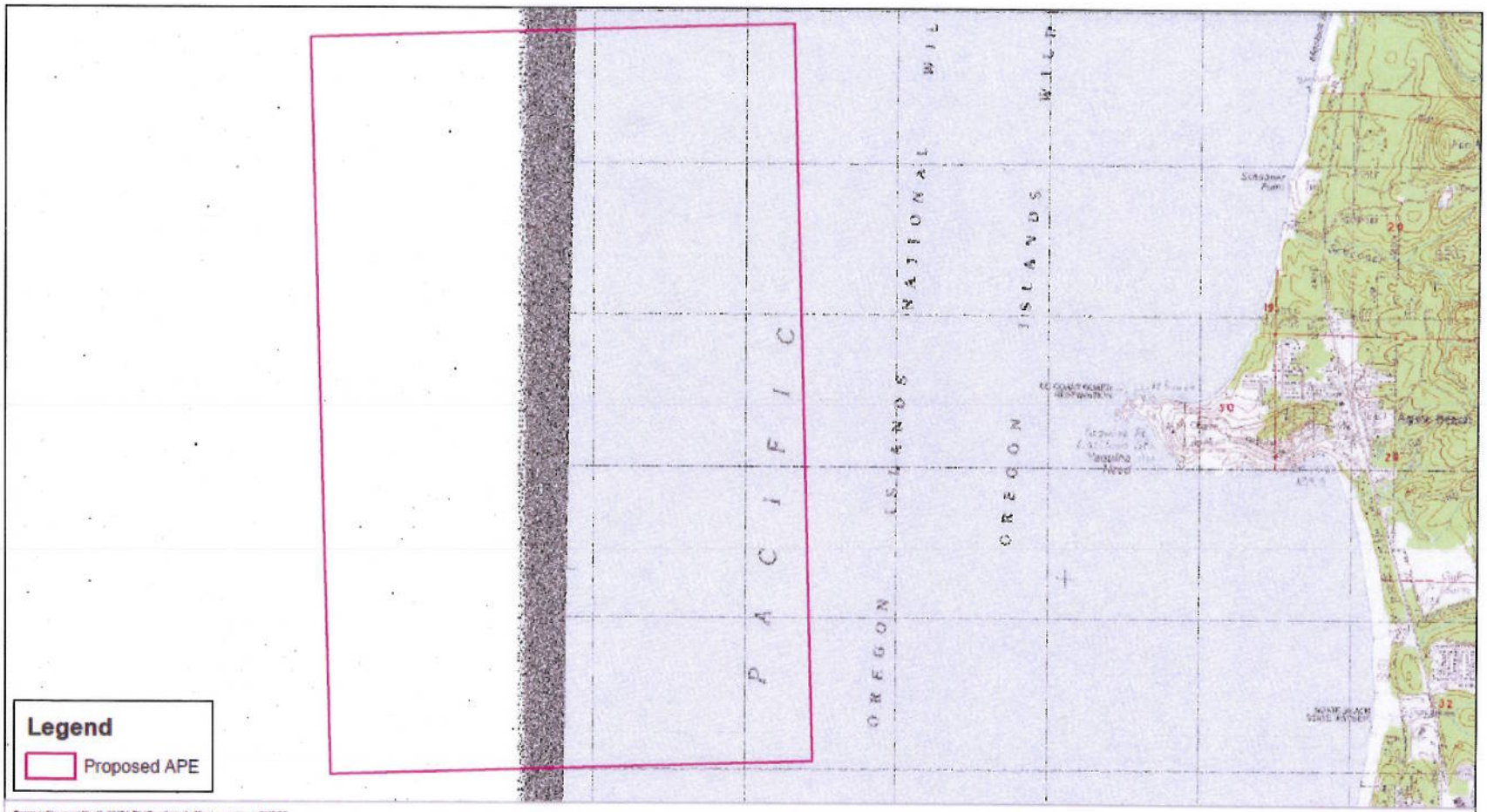
Laura Margason

NEPA Document Manager

Enclosures:

USGS 1:24,000 scale map Newport North, with project APE overlay
National Geographic Society TOPO (courtesy of ESRI)

cc: Dr. Dennis Griffin, State Archaeologist


PACIFIC
OREGON ISLANDS NATIONAL WIL
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Proposed APE
Source: Newport North 44124-F1 (Quadrangle Map), courtesy of USGS
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Oregon State University
Wave Energy
Proposed Area of Potential Effects
Map prepared by:
ICF
March 16, 2010

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

July 27, 2010

Thomas Taylor
Regulatory Project Manager
U.S. Army Corps of Engineers
CENWP-OD-GP
333 SW First Avenue
Portland, OR 97204

SUBJECT: INVITATION FOR COOPERATING AGENCY STATUS

Dear Mr. Taylor:

As you are aware, the U.S. Department of Energy (DOE) Golden Field Office in Colorado is the lead agency in preparing an Environmental Assessment (EA) for the development of a Mobile Ocean Test Berth (MOTB) located approximately two miles off the coast of Oregon near the city of Newport. The proposed project is expected to deliver a mobile capability for testing the output of wave energy conversion (WEC) devices for the generation of electricity. The Northwest National Marine Renewable Energy Center (NNMREC), led by Oregon State University, is the proponent of the project. NNMREC was established through the DOE Water Power Program and local funding to support wave and tidal energy development for the United States. DOE's Proposed Action is to provide funding to NNMREC to support the design, construction, testing, and deployment of a MOTB to perform off-electrical-grid testing of WEC devices.

During the first quarter of CY 2010, interactions regarding this project occurred between the EA contractor, NNMREC, and U.S. Army Corps of Engineers (USACE) to address project overviews and status of activities. In addition, on April 27, 2010, the USACE was provided with a Notice of Scoping for the proposed project and associated EA. Since the proposed project must meet the permitting requirements of Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act, the DOE would like to extend an invitation to the USACE to become a cooperating agency in the development of the document. We anticipate the delivery of the Preliminary Draft EA by August 9th. If formal status as a cooperating agency is not desired, please provide us with the level of involvement the USACE deems appropriate for the process.

We look forward to your response and the opportunity to continue to work together on this important alternative energy test project.

Regards,

Laura Margason

Subject: OSU MHK Species List
From: "Bridgette.Lohrman" <bridgette.lohrman@noaa.gov>
Date: 5/26/2010 1:24 PM
To: Christopher Earle <CEarle@jsanet.com>
CC: "Moelter, Christopher" <CMoelter@icfi.com>

Chris,

OSU requested a species list for the proposed MHK facility 1.5 to 3.0 miles offshore of Newort, Oregon. Here is a list of species that may occur in the project area. This response will be followed up with a formal letter.

Species		Listing Status	Critical Habitat	Protective Regulations
Marine and Anadromous Fish				
Chinook salmon (*Oncorhynchus tshawytscha*)				
	Lower Columbia River	T 6/28/05; 70 FR 37160	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160
	Upper Willamette River	T 6/28/05; 70 FR 37160	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160
	Upper Columbia River spring-run	E 6/28/05; 70 FR 37160	9/02/05; 70 FR 52630	ESA section 9 applies
	Snake River spring/summer run	T 6/28/05; 70 FR 37160	10/25/99; 64 FR 57399	6/28/05; 70 FR 37160
	Snake River fall-run	T 6/28/05; 70 FR 37160	12/28/93; 58 FR 68543	6/28/05; 70 FR 37160
Coho salmon (*O. kisutch*)				
	Lower Columbia River	T 6/28/05; 70 FR 37160	Not applicable	6/28/05; 70 FR 37160
	Oregon Coast	T 2/11/08; 73 FR 7816	2/11/08; 73 FR 7816	2/11/08; 73 FR 7816
	Southern Oregon / Northern California Coasts	T 6/28/05; 70 FR 37160	5/5/99; 64 FR 24049	6/28/05; 70 FR 37160
Green sturgeon (*Acipenser medirosris*				
	Southern	T 4/07/06; 71 FR 17757	10/09/09; 74 FR 52300	P 5/21/09; 74 FR 23822
Eulachon (*Thaleichthys pacificus*)				
	Eulachon	PT 3/13/09; 74 FR 10857	Not applicable	Not applicable
Marine Mammals				
Steller sea lion (*Eumetopias jubatus*)				
	Eastern	T 5/5/1997; 63 FR 24345	8/ 27/93; 58 FR 45269	11/26/90; 55 FR 49204
Blue whale (*Balaenoptera musculus*)				
		E 12/02/70; 35 FR 18319	Not applicable	ESA section 9 applies
Fin whale (*Balaenoptera physalus*)				
		E 12/02/70; 35 FR 18319	Not applicable	ESA section 9 applies
Humpback whale (*Megaptera novaeangliae*)				
		E 12/02/70; 35 FR 18319	Not applicable	ESA section 9 applies

Killer whale (*Orcinus orca*)				
	Southern Resident	E 11/18/05; 70 FR 69903	11/26/06; 71 FR 69054	ESA section 9 applies
Marine Turtles				
Leatherback turtle (*Dermochelys coriacea*)				
		E 6/02/70 ; 39 FR 19320	3/23/79; 44 FR 17710	ESA section 9 applies

-Bridgette

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Bridgette Lohrman
Oregon State Habitat Office
Habitat Conservation Division
NOAA's National Marine Fisheries Service
1201 NE Lloyd Blvd, Suite 1100
Portland, Oregon 97232
Phone: 503.230.5422
Fax: 503.231.6893

NOAA's mission is to understand and predict changes in Earth's
environment and conserve and manage coastal and marine resources
to meet our Nation's economic, social, and environmental needs.
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Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

January 11, 2012

Keith Kirkendall
Habitat Conservation Division
National Marine Fisheries Service-Northwest Region
1201 NE Lloyd Blvd.
F/NWRS, Room 1100
Portland, OR 97232-1274

Subject: Endangered Species Act, Magnuson-Stevens Fisheries Conservation and Management Act, and Marine Mammal Protection Act Consultation for the Northwest National Marine Renewable Energy Center and Oregon State University Wave Energy Test Facility Project, Newport, Oregon

Dear Mr. Kirkendall:

The U.S. Department of Energy (DOE) proposes to authorize the expenditure of Federal funding to the Northwest National Marine Renewable Energy Center (NNMREC) and Oregon State University to support their Wave Energy Test Facility Project (Project). The funding of NNMREC's proposed Project would enable of final design, construction, and initial operation, including deployment, of a wave energy testing facility that would be able to perform off-grid testing of Wave Energy Conversion (WEC) devices. The proposed Project would allow for testing the output of WEC devices in an open-water setting, studying the environmental effects of a range of wave energy technologies, and supporting the market development of environmentally sustainable technologies that harness wave energy to generate electricity in a manner compatible with ocean and coastal environments and coastal users.

Implementation of the proposed Project, as funded by DOE, would entail deploying up to two WEC devices and their associated moorings in the project site, operating the devices, and recovering the devices. Additional WEC device testing by NNMREC is anticipated throughout the life of the wave energy testing facility. It is estimated that each WEC devise would be deployed for a period of up to 12 months. Each WEC device mooring system would consist of up to a four-point mooring configuration that may be left in place between WEC deployments. Project operations would also involve deploying either a manned vessel carrying a test device or up to two instrumentation buoys to be connected to the WEC devices for testing. The instrumentation buoys could receive power from the WEC devices and would analyze and record technical data on the power generation. The instrumentation buoys would have their own mooring systems that would consist of up to a four-point mooring and would be connected to the WEC devices by a floating or submerged cable at a distance of approximately 100 meters (328 feet). The instrumentation buoys would be unmanned during the test. Tests would run for 1 to 6 months during the months of May to October, although the WEC devices might remain on site

for longer, as noted above. Depending on the preferences, any of three possible testing scenarios could be implemented at the project site:

1. The WEC developers could deploy WEC devices and monitor their power generation using equipment contained within the device. Such deployments would typically last at least several months and could continue for as long as 12 months, thus, allowing WEC developers to see how their devices handle the severe winter storms that affect this region. NNMREC may help developers with the design and construction of the internal testing equipment.

2. The WEC devices could be monitored using test equipment deployed on a vessel. In this case the WEC devices would be connected to the vessel by a floating or submerged electrical cable at a distance of approximately 100 meters (328 feet). The vessel would be manned at all times and stationed using its own anchor. Due to the expense of keeping a manned vessel on site, such tests would not be expected to last more than 10 days. The WEC devices might remain on site for a longer period of time to demonstrate the survivability of the device. In this case, the power generation unit would either be taken off line, or directed toward an on-WEC load (e.g., a resistor bank).

3. The WEC devices could be monitored using test equipment deployed in self-contained instrumentation buoys. The instrumentation buoys would have their own mooring system that would consist of up to a four-point mooring configuration and would be connected to the WEC devices by a floating or submerged cable at a distance of approximately 100 meters (328 feet). The instrumentation buoys would be unmanned during the test. Tests would run for 1 to 6 months, although the WEC device itself might remain on site for longer, as noted above.

At the end of the proposed Project, WEC devices and the instrumentation buoys would be permanently removed from the site. All mooring components would be permanently removed at this time, with the possible exception of anchors, which may be decommissioned on site.

The proposed Project would be located within a 3.4-square-kilometer (1-square-nautical-mile) site (project site) in the Pacific Ocean off the Oregon coast near the city of Newport (see Figure 1-1 in the enclosed Biological Assessment). The final project site was refined through environmental studies and consultation with stakeholders and other interested parties, including the NNMREC research team, Hatfield Marine Science Center, Fisherman Involved in Natural Energy, and Oregon Sea Grant. Over a 24-month period, beginning prior to scoping and during more than 12 months of preliminary project development, NNMREC conducted a site selection process, which involved stakeholders and interested parties and resulted in a variety of site criteria.

DOE has prepared a Biological Assessment (BA), which includes a detailed description of the proposed Project and addresses the potential effects of the proposed Project on species listed as endangered or threatened, or proposed for such listing, under the Endangered Species Act (ESA) as well as the proposed Project's effects on critical habitat. The enclosed BA also

incorporates an evaluation of the potential effects of the proposed Project on Essential Fish Habitat (EFH), in compliance with the Magnuson-Stevens Fishery Conservation and Management Act, as amended in 2007, and establishes proposed Project compliance with the Marine Mammal Protection Act, as amended in 2007. The BA is enclosed with this letter. The conclusions of the BA are summarized below.

Endangered Species Act: Listed Species and Designated Critical Habitat

DOE has determined that the proposed Project ***may affect, but is not likely to adversely affect*** the following species under the jurisdiction of the National Marine Fisheries Service:

- Chinook salmon, lower Columbia River ESU (*Oncorhynchus tshawytscha)*
- Chinook salmon, upper Willamette River ESU (*Oncorhynchus tshawytscha)*
- Chinook salmon, upper Columbia River spring-run ESU (*Oncorhynchus tshawytscha)*
- Chinook salmon, Snake River spring/summer run ESU (*Oncorhynchus tshawytscha)*
- Chinook salmon, Snake River fall-run ESU (*Oncorhynchus tshawytscha)*
- Coho salmon, Southern Oregon/Northern California coast ESU (*Oncorhynchus kisutch)*
- Coho salmon, Oregon coast ESU (*Oncorhynchus kisutch)*
- Coho salmon, lower Columbia River ESU (*Oncorhynchus kisutch)*
- Green sturgeon, southern DPS (*Acipenser medirosris)*
- Eulachon, southern DPS (*Thaleichthys pacificus)*
- Leatherback turtle (*Dermochelys coriacea)*
- Green sea turtle (*Chelonia mydas*)
- Loggerhead tea turtle, Pacific DPS (*Caretta caretta*)
- Olive Ridley sea turtle (*Lepidochelys olivacea*)
- Steller sea lion, eastern DPS (*Eumetopias jubatus)*
- Killer whale, southern resident DPS (*Orcinus orca)*
- Humpback whale (*Megaptera novaeangliae)*
- Blue whale (*Balaenoptera musculus)*
- Fin whale (*Balaenoptera physalus*)

Designated Critical Habitat (DCE) has been identified for several of the species listed above. DOE has determined that the proposed Project would have ***no effect*** on DCE for the following species:

- Chinook salmon, lower Columbia River ESU (*Oncorhynchus tshawytscha)*
- Chinook salmon, upper Willamette River ESU (*Oncorhynchus tshawytscha)*
- Chinook salmon, upper Columbia River spring-run ESU (*Oncorhynchus tshawytscha)*
- Chinook salmon, Snake River spring/summer run ESU (*Oncorhynchus tshawytscha)*
- Chinook salmon, Snake River fall-run ESU (*Oncorhynchus tshawytscha)*
- Coho salmon, Southern Oregon / Northern California coast ESU (*Oncorhynchus kisutch)*
- Coho salmon, lower Columbia River ESU (*Oncorhynchus kisutch)*
- Eulachon, southern DPS (*Thaleichthys pacificus*)
- Green sea turtle (*Chelonia mydas*)
- Steller sea lion, eastern DPS (*Eumetopias jubatus)*
- Killer whale, southern resident DPS (*Orcinus orca)*

DOE has determined that the proposed Project ***may affect, but is not likely to adversely modify*** DCE for the following species:

- Coho salmon, Oregon coast ESU (*Oncorhynchus kisutch)*
- Green sturgeon, southern DPS (*Acipenser medirosris)*
- Leatherback turtle, eastern DPS (*Dermochelys coriacea)*

Magnuson-Stevens Fisheries Conservation Act: Essential Fish Habitat

The area in which the proposed Project would take place includes designated EFH for three fishery management plans: coastal pelagics, Pacific coast groundfish, and Pacific salmon. The species covered in these three fishery management plans are summarized in Tables 8-1, 8-2, and 8-3 in the BA prepared by DOE and enclosed with this letter. DOE has determined that the proposed Project ***would not adversely affect*** designated EFH for federally managed fisheries in Oregon waters.

Marine Mammal Protection Act

Marine mammals are protected under the Marine Mammal Protection Act of 1972, which restricts the taking, possession, transportation, selling, offering for sale, and importing of marine mammals. In addition to the five marine mammal species listed under the ESA, a number of other marine mammals are likely to occur in the project site or in the nearby surrounding waters. Marine mammal species likely to occur in and around the project site include cetaceans and pinnipeds and are described in Section 5.10 of the enclosed BA.

The most common year-round inhabitants are the pinnipeds, including the Pacific harbor seal and Steller sea lion. Male California sea lions and northern elephant seals are occasionally observed foraging in southern and central Oregon coastal areas but are not regular inhabitants. Section 6.1.18 of the enclosed BA includes an analysis of effects of the proposed Project on the Steller sea lion, eastern DPS and identifies potential impact mechanisms that can be considered applicable to other pinniped species in and around the project area.

Cetaceans potentially present in and around the project area include the transient killer whale, California gray whale, killer whale of the southern resident group, blue whale, finback whale, sei whale, Pacific right whale, humpback whale, and sperm whale. Section 6.1.19 though Section 6.1.22 of the enclosed BA includes an analysis of effects on cetacean species listed under the ESA. It describes potential impact mechanisms that can be considered applicable to other cetacean species in and around the project area.

In Section 7.18 of the BA, which includes the effects determination for the Steller sea lion, eastern DPS, DOE concludes that the proposed Project would result in an insignificant probability of incidental take for this species. In Section 7.19 through Section 7.22, which includes the effects determination for the four cetacean species analyzed in the BA, DOE concludes that the proposed Project would result in an insignificant probability of incidental take for these species.

Because the impact mechanisms and potential impacts for pinniped and cetacean species in and around the proposed Project area would be similar to those for the ESA-listed species analyzed in detail in the enclosed BA, DOE has determined that incidental take of marine mammals is unlikely to occur.

DOE requests your concurrence with the findings summarized above and detailed in the enclosed BA. We look forward to hearing from you regarding this project. Please feel free to contact me by phone at 720.356.1322 or via email at laura.margason@go.doe.gov if you have any questions or comments.

Sincerely,

Laura Margason

Laura Margason
NEPA Document Manager

Enclosures

Biological Assessment for the Northwest National Marine Renewable Energy Center and Oregon State University Wave Energy Test Facility Project

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

January 11, 2012

Ann Grey
Program manager
U.S. Fish and Wildlife Service
2600 SE 98th Avenue, Suite 100
Portland, OR 97266

Subject: Endangered Species Action Section 7 Informal Consultation for the Northwest National Marine Renewable Energy Center and Oregon State University Wave Energy Test Facility Project, Newport, Oregon

Dear Ms. Grey:

The U.S. Department of Energy (DOE) proposes to authorize the expenditure of Federal funding to the Northwest National Marine Renewable Energy Center (NNMREC) and Oregon State University to support their Wave Energy Test Facility Project (Project). The funding of NNMREC's proposed Project would enable of final design, construction, and initial operation, including deployment, of a wave energy testing facility that would be able to perform off-grid testing of Wave Energy Conversion (WEC) devices. The proposed Project would allow for testing the output of WEC devices in an open-water setting, studying the environmental effects of a range of wave energy technologies, and supporting the market development of environmentally sustainable technologies that harness wave energy to generate electricity in a manner compatible with ocean and coastal environments and coastal users.

Implementation of the proposed Project, as funded by DOE, would entail deploying up to two WEC devices and their associated moorings in the project site, operating the devices, and recovering the devices. Additional WEC device testing by NNMREC is anticipated throughout the life of the wave energy testing facility. It is estimated that each WEC devise would be deployed for a period of up to 12 months. Each WEC device mooring system would consist of up to a four-point mooring configuration that may be left in place between WEC deployments. Project operations would also involve deploying either a manned vessel carrying a test device or up to two instrumentation buoys to be connected to the WEC devices for testing. The instrumentation buoys could receive power from the WEC devices and would analyze and record technical data on the power generation. The instrumentation buoys would have their own mooring systems that would consist of up to a four-point mooring and would be connected to the WEC devices by a floating or submerged cable at a distance of approximately 100 meters (328 feet). The instrumentation buoys would be unmanned during the test. Tests would run for 1 to 6 months during the months of May to October, although the WEC devices might remain on site for longer, as noted above. Depending on the preferences, any of three possible testing scenarios could be implemented at the project site:

1. The WEC developers could deploy WEC devices and monitor their power generation using equipment contained within the device. Such deployments would typically last at least several months and could continue for as long as 12 months, thus, allowing WEC developers to see how their devices handle the severe winter storms that affect this region. NNMREC may help developers with the design and construction of the internal testing equipment.

2. The WEC devices could be monitored using test equipment deployed on a vessel. In this case the WEC devices would be connected to the vessel by a floating or submerged electrical cable at a distance of approximately 100 meters (328 feet). The vessel would be manned at all times and stationed using its own anchor. Due to the expense of keeping a manned vessel on site, such tests would not be expected to last more than 10 days. The WEC devices might remain on site for a longer period of time to demonstrate the survivability of the device. In this case, the power generation unit would either be taken off line, or directed toward an on-WEC load (e.g., a resistor bank).

3. The WEC devices could be monitored using test equipment deployed in self-contained instrumentation buoys. The instrumentation buoys would have their own mooring system that would consist of up to a four-point mooring configuration and would be connected to the WEC devices by a floating or submerged cable at a distance of approximately 100 meters (328 feet). The instrumentation buoys would be unmanned during the test. Tests would run for 1 to 6 months, although the WEC device itself might remain on site for longer, as noted above.

At the end of the proposed Project, WEC devices and the instrumentation buoys would be permanently removed from the site. All mooring components would be permanently removed at this time, with the possible exception of anchors, which may be decommissioned on site.

The proposed Project would be located within a 3.4-square-kilometer (1-square-nautical-mile) site (project site) in the Pacific Ocean off the Oregon coast near the city of Newport (see Figure 1-1 in the enclosed Biological Assessment). The final project site was refined through environmental studies and consultation with stakeholders and other interested parties, including the NNMREC research team, Hatfield Marine Science Center, Fisherman Involved in Natural Energy, and Oregon Sea Grant. Over a 24-month period, beginning prior to scoping and during more than 12 months of preliminary project development, NNMREC conducted a site selection process, which involved stakeholders and interested parties and resulted in a variety of site criteria.

DOE has prepared a Biological Assessment (BA), which includes a detailed description of the proposed Project and addresses the potential effects of the proposed Project on species listed as endangered or threatened, or proposed for such listing, under the Endangered Species Act (ESA) as well as the proposed Project's effects on critical habitat. The BA is enclosed with this letter. The conclusions of the BA are summarized below.

DOE has determined that the proposed Action ***may affect but, is not likely to adversely affect*** the following species under the jurisdiction of the U.S. Fish and Wildlife Service:

- Marbled murrelet (*Brachyramphus marmoratus)*
- Western snowy plover (*Charadrius alexandrinus nivosus)*
- Short-tailed albatross (*Phoebastria albatrus)*

Designated Critical Habitat (DCE) has been identified for two of the species listed above. DOE has determined that the proposed Action would have ***no effect*** on DCE for the following species:

- Marbled murrelet (*Brachyramphus marmoratus)*
- Western snowy plover (*Charadrius alexandrinus nivosus)*

DOE requests your concurrence with the determinations summarized above and detailed in the enclosed BA. We look forward to hearing from you regarding this project. Please feel free to contact me by phone at 720.356.1322 or via email at laura.margason@go.doe.gov if you have any questions or comments.

Sincerely,

Laura Margason

Laura Margason
NEPA Document Manager

Enclosures

Biological Assessment for the Northwest National Marine Renewable Energy Center and Oregon State University Mobile Ocean Test Berth Project

Moelter, Chris

From: Moelter, Christopher
Sent: Friday, May 18, 2012 7:15 AM
To: kim.hatfield@noaa.gov; keith.kirkendall@noaa.gov
Cc: Oestman, Richard; Meleah.Ashford@oregonstate.edu; laura.margason@go.doe.gov
Subject: NNMREC/OSU Wave Energy Test Project Biological Assessment

Dear Mr. Kirkendall and Ms. Hatfield:

On behalf of the U.S. Department of Energy (DOE), I present you with a Biological Assessment (BA) for the Northwest National Marine Renewable Energy Center and Oregon State University Wave Energy Test Project. The BA includes a detailed description of the Proposed Project and addresses the potential effects of the Proposed Project on species listed as endangered or threatened, or proposed for such listing, under the Endangered Species Act (ESA) as well as the Proposed Project's effects on critical habitat. The enclosed BA also incorporates an evaluation of the potential effects of the Proposed Project on Essential Fish Habitat (EFH), in compliance with the Magnuson-Stevens Fishery Conservation and Management Act, as amended in 2007, and establishes Proposed Project compliance with the Marine Mammal Protection Act, as amended in 2007.

The BA can be accessed through the ICF Secure File Transfer (SFT) site by following the link below. Please do not hesitate to contact me if you experience any difficulty in accessing or downloading the BA through the SFT and I will make immediate arrangements to provide it to you through alternative means.

The DOE requests your concurrence with the findings in the attached BA. We look forward to hearing from you regarding this project. Please feel free to contact me by phone at 503.525.6145 or email at CMoelter@icfi.com or Laura Margason, NEPA Document Manager, DOE at 720.356.1322 or via email at laura.margason@go.doe.gov if you have any questions or comments.

Sincerely,

Christopher Moelter| Manager | 503.525.6145 (office) | cmoelter@icfi.com | icfi.com
ICF INTERNATIONAL | 615 SW Alder Street, Suite 200, Portland, OR 97205 | 503.228.3820 (fax)

File(s) will be available for download until **02 June 2012**:

File: OSUWave-BA_05172012.pdf, 5,566.56 KB

Moelter, Chris

From: Moelter, Christopher
Sent: Friday, May 18, 2012 7:18 AM
To: Jeff_Everett@fws.gov
Cc: laura.margason@go.doe.gov; Oestman, Richard
Subject: NNMREC/OSU Wave Energy Test Project Biological Assessment

Dear Mr. Everett:

On behalf of the U.S. Department of Energy (DOE), I present you with a Biological Assessment (BA) for the Northwest National Marine Renewable Energy Center and Oregon State University Wave Energy Test Project. The BA includes a detailed description of the Proposed Project and addresses the potential effects of the Proposed Project on species listed as endangered or threatened, or proposed for such listing, under the Endangered Species Act (ESA) as well as the Proposed Project's effects on critical habitat.

The BA can be accessed through the ICF Secure File Transfer (SFT) site by following the link below. Please do not hesitate to contact me if you experience any difficulty in accessing or downloading the BA through the SFT and I will make immediate arrangements to provide it to you through alternative means.

The DOE requests your concurrence with the findings in the attached BA. We look forward to hearing from you regarding this project. Please feel free to contact me by phone at 503.525.6145 or email at CMoelter@icfi.com or Laura Margason, NEPA Document Manager, DOE at 720.356.1322 or via email at laura.margason@go.doe.gov if you have any questions or comments.

Sincerely,

Christopher Moelter| Manager | 503.525.6145 (office) | cmoelter@icfi.com | icfi.com
ICF INTERNATIONAL | 615 SW Alder Street, Suite 200, Portland, OR 97205 | 503.228.3820 (fax)

File(s) will be available for download until **02 June 2012**:

File: OSUWave-BA_05172012.pdf, 5,566.56 KB

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1201 NE Lloyd Boulevard, Suite 1100
PORTLAND, OREGON 97232-1274
June 7, 2012

Laura Margason
Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

Debra Henry
US Army Corps of Engineers,
Portland District
PO Box 2946
Portland, Oregon 97208

RE: NMFS Request for Additional Information regarding the Department of Energy's Request to Initiate Endangered Species Act (ESA) section 7 consultation, and submittal of their Biological Assessment – Northwest National Marine Renewable Energy Center and Oregon State University Wave Energy Test Facility Project, May 2012 and US Army Corps Engineers Nationwide Permit #5 Application – Wave Energy Test Project at the Northwest National Marine Renewable Energy Center, March 27, 2012.

Dear Ms. Margason and Ms. Henry:

After reviewing the submitted Biological Assessment (BA), National Marine Fisheries Service (NMFS) needs specific additional information listed below before Endangered Species Act (ESA) consultation can begin. The requested additional information may be submitted on its own, revision and resubmission of the BA is not necessary.

1) Please provide a detailed description of anchor, tethering and tensioning plans or detailed drawings for all lines on all structures. This information is necessary for the evaluation of entanglement risk for marine mammals and ESA-listed species.

2) Please provide a detailed description including all tethering and tensioning plans, for any structures (e.g. anchors, lines, subsurface and surface floats, marker buoys) which may remain in place over the winter or any time when the WET-NZ buoy, Ocean Sentinel or other structures are removed for maintenance or overwintering. This information is necessary for the evaluation of entanglement risk for marine mammals and ESA-listed species.

3) Please clarify the statement "The Ocean Sentinel will be constructed with NMFS-approved passive deterrents, such as bull rails and netting, to prevent its use as a marine mammal haulout." If the Northwest National Marine Renewable Energy Center (NNMREC) has determined what

form of deterrent would be used, please provide a detailed description and plan drawings. If NNMREC is seeking guidance on development of an appropriate passive deterrent, please clearly state when such discussion is proposed to occur and that the Ocean Sentinel would not be deployed until NMFS has approved the deterrent method. This information is necessary to evaluate the risk of pinniped haulout.

4) Please clarify the potential operation of "oscillating water column" type wave energy converter (WEC). The limited information provided makes it difficult to determine if there is a risk of entrainment, entrapment or injury of marine species. This information is necessary to evaluate the effects of testing this type of device on ESA-listed species.

5) Please clarify the duration and nature of activities proposed to occur in Yaquina Bay which would not be considered normal marine/bay traffic and operations, such as deployment of the testing equipment or WECs in the bay for longer than 7 days. This information is necessary to evaluate the effects on Critical Habitat within Yaquina Bay.

6) Please clarify that derelict gear monitoring and, if deemed necessary, removal (Adaptive Management Framework (AMF) Section 3.2 p.6) will be conducted when **any** project related equipment remains in the water (e.g. anchors, lines, tethers, marker buoys and similar items related to the Ocean Sentinel and mooring gear, as well as each WEC that will be tested at the site). Not just when the Ocean Sentinel, TRIAXYS or other monitoring equipment is deployed. Please provide the frequency and method of such monitoring.

7) Please provide the analysis of effects to the Primary Constituent Elements (PCEs) of green sturgeon critical habitat referenced in the BA section 7.12 Green Sturgeon, southern DPS or clearly describe where in Chapter 6 the discussion and evaluation of effects on the PCEs for green sturgeon critical habitat is located. The final paragraph of this section concludes that the proposed action may affect but is not likely to adversely modify designated critical habitat of the green sturgeon and refers to an analysis in Chapter 6. However, NMFS was unable to locate the referenced analysis and needs this information for its effects analysis.

8) While not an additional piece of information needed, NMFS recommends that recording and reporting of opportunistic observations of marine mammals and other listed species during any visits to the site including installation, maintenance, monitoring and removal visits. This should be included in the both the NNMREC AMF and WET-NZ Adaptive Mitigation Plan, as well as any future WEC test Adaptive Mitigation Plan. The observations should not be a separate monitoring effort, but rather a practice added to any site visits and should not be limited to identification of injured or stranded marine mammals.

We appreciate the efforts the U.S. Department of Energy, US Army Corps of Engineers and NNMREC have made to work with NMFS on the development of the open ocean test program which will further research and development of alternative energy sources such as wave energy.

If you have any questions or concerns, please feel free to contact Kim Hatfield (503-231-2315 or Kim.Hatfield@noaa.gov).

Sincerely,

Keith Kirkendall, Chief
FERC and Water Diversions Branch
Hydropower Division

cc: (Sent electronically, unless noted as "hard copy")
Therese Hampton, PEV
Delia Kelley, ODFW
Debra Henry, Corps
Jeff Everett, USFWS

Northwest National Marine Renewable Energy Center-OSU
Oregon State University, 204 Rogers Hall, Corvallis, Oregon 97331-6001
Phone 541-737-9492 | **Fax** 541-737-2600 | http://nnmrec.oregonstate.edu

June 14, 2012

Ms. Laura Margason
Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, CO 80401-3393

Ms. Debra Henry
Biologist/Regulatory Project Manager
United States Army Corps of Engineers
Portland District Regulatory Office
333 SW First Avenue
Portland, OR 97204-3495

Subject: NMFS Request for Additional Information

Dear Ms. Margason and Ms. Henry,
On June 7, 2012, the National Marine Fisheries Service (NMFS) submitted a request for additional information to support Endangered Species Act (ESA) consultation for the US Department of Energy's funding of the Northwest National Marine Renewable Energy Center (NNMREC) and the US Army Corps of Engineers' issuance of Nationwide Permit #5 for the 2012 – 2013 Wave Energy Test Project at the NNMREC ocean test site. We have reviewed the request and our responses are enclosed. If you have any questions or require further information, please feel free to contact me at (541) 737-9492 or via email at belinda.batten@oregonstate.edu.

Sincerely,

Belinda Batten
NNMREC Director

Cc (via electronic mail):

Keith Kirkendall, NMFS
Kim Hatfield, NMFS
Delia Kelley, ODFW
Jeff Everett, USFWS

Northwest National Marine Renewable Energy Center at OSU Response to the National Marine Fisheries Service's Request for Additional Information

June 14, 2012

Note: Each of NMFS's requests is shown in *italics*. NNMREC's response to each request follows.

1) Please provide a detailed description of anchor, tethering and tensioning plans or detailed descriptions drawings for all lines on all structures. This information is necessary for the evaluation of entanglement risk for marine mammals and ESA-listed species.

Response: The mooring systems for the Ocean Sentinel, WET-NZ device and TRIAXYS™ Wave Monitoring Buoy, as well as the overall deployment configuration, have been fully analyzed under a wide range of loading conditions to ensure the reliability of the systems and minimize the risk of marine mammal entanglement. Due to the dynamic nature of the ocean environment, the amount of tension in the lines will vary depending on the conditions.

The anchoring and mooring system is described in detail with graphics in section 2.8 of the Biological Assessment. In general, during a test, the anchoring and mooring will include:

1. Ocean Sentinel – one buoy anchored using a three-point system attached to moorings with surface floats. The tension in the Ocean Sentinel mooring lines will range between 500 – 1,500 lbs during calm sea states and could reach upwards of 6,000 lbs during significant wave events.
2. WET-NZ Device – one buoy anchored using a three-point system attached to moorings with surface floats. The tension in the WET-NZ mooring lines will range from 3,300 – 13,000 lbs in calm seas and could reach 35,000 lbs of tension under extreme weather conditions. The umbilical cable between the WET-NZ and the Ocean Sentinel is designed with subsurface floats to maintain tension at all times, with a peak tension of approximately 1,500 lbs.
3. TRIAXYS wave measurement device – one buoy anchored to the west of the test with a single-point mooring.
4. Marker buoys - four buoys anchored at the corners of the site on single-point moorings.

While the levels of tension in the mooring lines will vary with the sea state, the mooring systems feature subsurface floats to maintain tension in the lines taught and prevent any "slack" when the load decreases. Additionally, the mooring lines have an extremely high breaking strength, such that they will not "snap" under extreme load conditions, including that of a potential whale encounter.

2) Please provide a detailed description, including all tethering and tensioning plans, for any structures (e.g. anchors, lines, subsurface and surface floats, marker buoys) which may remain in place over the winter or any time when the WET-NZ buoy, Ocean Sentinel or other structures are removed for maintenance or overwintering. This information is necessary for the evaluation of entanglement risk for marine mammals and ESA-listed species.

Response: As described in section 2.8 of the Biological Assessment and the response above, the mooring systems and deployment configuration are designed to maintain tension at all times, in both static and dynamic states. To ensure that no slack is introduced into the system when the Ocean Sentinel is removed (either for maintenance or overwintering), its mooring lines will be connected to the corner marker buoys, and the marker buoys' anchors will maintain tension on the lines. When the WET-NZ is removed, its anchors and mooring lines will be removed as well.

3) Please clarify the statement "The Ocean Sentinel will be constructed with NMFS-approved passive deterrents, such as bull rails and netting, to prevent its use as a marine mammal haulout." If the Northwest National Marine Renewable Energy Center (NNMREC) has determined what form of deterrent would be used, please provide a detailed description and plan drawings. If NNMREC is seeking guidance on development of an appropriate passive deterrent please clearly state when such discussion is proposed to occur and that the Ocean Sentinel would not be deployed until NMFS has approved the deterrent method. This information is necessary to evaluate the risk of pinniped haulout.

Response: Due to the irregular shapes of the Ocean Sentinel, WET-NZ and TRIAXYS buoy, NNMREC does not anticipate that pinnipeds would be able to haul-out on any of these structures. As described in the Adaptive Mitigation Plan (AMP) and the Adaptive Management Framework (AMF), NNMREC would make opportunistic observations of marine mammals and other listed species during installation, maintenance, monitoring and any other activities at the project site. If pinnipeds are observed on one or more of the project structures, NNMREC would implement the haulout protocols listed in the AMP and notify NMFS to report the incident. In addition, NNMREC would seek guidance from NMFS on selecting and installing an appropriate haulout deterrent, as well as any other measures deemed necessary (e.g., device removal, modification of Project operations or monitoring plans).

4) Please clarify the potential operation of "oscillating water column" type wave energy converter (WEC). The limited information provided makes it difficult to determine if there is a risk of entrainment, entrapment or injury of marine species. This information is necessary to evaluate the effects of testing this type of device on ESA-listed species.

Response: Because testing of an OWC device has not been proposed, the operations of such a device cannot be described in further detail at this time. However, in general, and specifically for the example provided in the EA, the water column moves up and down with the wave action in a relatively stationary open chamber. As the peak of the wave passes air is compressed in the chamber and pushed through a turbine either at the top of the chamber or on the side of the chamber. As the water recedes as the wave trough passes a vacuum is created and air passes through the turbine back into the chamber. For this reason, these devices are sometimes referred to as oscillating "air" columns since oscillating "water" column is somewhat misleading.

If testing of an OWC device(s) is proposed, then NNMREC would consult with NMFS to evaluate the potential impacts and identify measures to minimize any risk of entrainment, entrapment or injury of marine species. Such consultation would take place during the permitting of the proposed test, in the Adaptive Management Committee proceedings, and/or other appropriate forum (e.g., direct consultation between NNMREC and NMFS). While there is limited information on OWC devices at this time, the NMFS screening criteria for traditional

hydropower projects may be useful in developing mitigation measures for OWC devices to minimize the risk of entrainment, entrapment or injury of marine species.

5) Please clarify the duration and nature of activities proposed to occur in Yaquina Bay which would not be considered normal marine/bay traffic and operations, such as deployment of the testing equipment or WECs in the bay for longer than 7 days. This information is necessary to evaluate the effects on Critical Habitat within Yaquina Bay.

Response: When the Ocean Sentinel and/or WET-NZ are removed from the project site for maintenance, there may be a need for dockside mooring at existing piers or docks in Newport. Dockside moorings would not occur for more than seven days at a time and would not involve excessive generation of noise or electrical currents, disturbance to bottom habitat, or changes in water quality. These activities would be within the scope of normal marine traffic and operations and would be performed in compliance with all applicable laws.

If activities that exceed the scope or duration of normal marine traffic and operations are proposed in the future, NNMREC would consult with NMFS and obtain the appropriate authorizations. Any such activities, once approved, would be performed within the in-water work window for Yaquina Bay and in adherence with any guidance or conditions prescribed by NMFS.

6) Please clarify that derelict gear monitoring and, if deemed necessary, removal (Adaptive Management Framework Section 3.2 p.6) will be conducted when any project related equipment remains in the water (e.g. anchors, lines, tethers, marker buoys and similar items related to the Ocean Sentinel and mooring gear, as well as each WEC that will be tested at the site). Not just when the Ocean Sentinel, TRIAXYS or other monitoring equipment is deployed. Please provide the frequency and method of such monitoring.

Response: Response to discovery of derelict gear would be performed in accordance with the thresholds and measures described in the AMP. In addition, NNMREC will add the following procedures to the AMP and the AMF:

i. **Detection:** NNMREC will perform underwater visual monitoring at least three times for each test: once prior to device deployment, once during active deployment, and once after device removal; as described in the Benthic Habitat Monitoring Plan (Appendix A of the BA). For the 2012 WET-NZ test this is anticipated to be June, August, and October 2012. The before and after monitoring would be when neither the Ocean Sentinel, TRIAXYS nor WEC device is deployed. Video lander sampling of anchors and reference locations will continue for the duration of the project (i.e., when any project related equipment remains in the water), weather permitting (as described in the Benthic Habitat Monitoring Plan). This sample method will provide for monitoring of derelict gear, as well as animal entanglement.

ii. **Notification**: If derelict gear is detected, NNMREC will contact NMFS and ODFW within two days of detection.

iii. **Removal**: Any gear entangled with project structures or moorings will be removed in spring/summer (prior to test device deployment) or in fall

(immediately following test device removal). If the gear poses an entanglement risk to marine organisms, NNMREC will consult with NMFS and ODFW to determine if an earlier or more immediate response is necessary (as described in the AMF and AMP).

iv. **Return**: NNMREC will make every effort to return gear to owner and will be responsible for storage of gear and contacting owner to retrieve property; ODFW can provide owner contact information.

v. **Recycle**: In the event that attempts to return gear are unsuccessful, gear may be recycled at the "Fishing for Energy" project located at Newport's International Port.

In addition to the above procedures, NNMREC will perform visual monitoring from the water surface during all visits to the project site to detect any entangled gear. NNMREC will also participate in monthly FINE meetings, contact members of the fishing community directly, and maintain ongoing communication with ODFW in regards to lost or entangled gear. Further, NNMREC would consult with NMFS, either through their participation in the Adaptive Management Committee or otherwise, to ensure the efficacy of the derelict gear monitoring and response methods for the duration of Project activities. For instance, if derelict gear is routinely found caught on the mooring lines or anchors, monitoring and removal episodes may need to be increased.

7) Please provide the analysis of effects to the Primary Constituent Elements (PCEs) of green sturgeon critical habitat referenced in the BA section 7.12 Green Sturgeon, southern DPS or clearly describe where in Chapter 6 the discussion and evaluation of effects on the PCEs for green sturgeon critical habitat is located. The final paragraph of this section concludes that the proposed action may affect but is not likely to adversely modify designated critical habitat of the green sturgeon and refers to an analysis in Chapter 6. However, NMFS was unable to locate the referenced analysis and needs this information for its effects analysis.

Response: Please see **Attachment 1**: Green Sturgeon Southern DPS: Primary Constituent Elements of Critical Habitat

8) While not an additional piece of information needed, NMFS recommends that recording and reporting of opportunistic observations of marine mammals and other listed species during any visits to the site including installation, maintenance, monitoring and removal visits. This should be included in the both the NNMREC AMF and WET-NZ Adaptive Mitigation Plan, as well as any future WEC test Adaptive Mitigation Plan. The observations should not be a separate monitoring effort, but rather a practice added

Response: As described in the AMP, opportunistic observations of marine mammals and other listed species would be conducted in a consistent manner, as frequently as possible. Additionally, NNMREC would coordinate with NMFS, either through their participation in the Adaptive Management Committee or individually, to develop a standard form to use in recording and reporting marine mammal observations. If marine mammals or sea turtles are observed entangled, injured or impinged at the Project, NNMREC would immediately follow the Reporting Protocol for Injured or

Stranded Marine Mammals (listed in Section B. iii of the AMP) and, as soon as practical within 24 hours, provide NMFS and ODFW with available information on the incident. In addition, NNMREC would consult with NMFS and ODFW regarding modifying the Project and/or monitoring plans.

ATTACHMENT 1

Green Sturgeon Southern DPS: Primary Constituent Elements of Critical Habitat

Chris Earle, ICF. June 11, 2012.

Critical habitat for the green sturgeon southern DPS was designated by NMFS on October 9, 2009 (74 FR 52300). Critical habitat includes the coastal marine waters 110 meters (361 feet) deep from Monterey Bay, California north to Cape Flattery, Washington, including the Strait of Juan de Fuca, Washington, to its United States boundary; and certain other areas, specifically including Yaquina Bay (74 FR 52300). The designated critical habitat includes the action area. In their proposal for critical habitat designation, NMFS identified PCEs for green sturgeon critical habitat in freshwater, estuarine, and nearshore marine habitats. The PCEs for freshwater habitat are irrelevant as no freshwater habitat occurs in the action area. The PCEs for estuarine habitat and nearshore marine habitat are identified below.

For estuarine habitat:

- Food resources that "primarily consist of benthic invertebrates and fishes, including crangonid shrimp, burrowing thalassinidean shrimp (particularly the burrowing ghost shrimp), amphipods, isopods, clams, annelid worms, crabs, sand lances, and anchovies" (73 FR 52089).
- Water flow (only applicable to the Sacramento River system).
- Water quality "including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages." (73 FR 52089).
- Migratory corridor, "[a] migratory pathway necessary for the safe and timely passage of Southern DPS fish within estuarine habitats and between estuarine and riverine or marine habitats." (73 FR 52089).
- Water depth, "[a] diversity of depths necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages." (73 FR 52089).
- Sediment quality "necessary for normal behavior, growth, and viability of all life stages" (73 FR 52090).

For coastal marine habitat:

- Migratory corridor, "[a] migratory pathway necessary for the safe and timely passage of Southern DPS fish within marine and between estuarine and marine habitats" (73 FR 52090).
- Water quality "with adequate dissolved oxygen levels and acceptably low levels of contaminants" (73 FR 52090).

- Food resources, including "[a]bundant prey items for subadults and adults, which may include benthic invertebrates and fishes" (73 FR 52089).

The proposed action has little potential to affect PCEs for estuarine habitat; the action area only includes Yaquina Bay because project components would be deployed from and returned to that site, and physical locations used in Yaquina Bay would all be associated with pre-existing marine service facilities. As separately reported, no extended project-related activities (lasting more than 7 days) would occur in Yaquina Bay, which also supports a determination that those activities have minimal potential to affect PCEs for estuarine habitat.

Regarding PCEs for coastal marine habitat, the action area for the proposed project is located in nearshore marine waters traversed by green sturgeon migrating and foraging along the Oregon coast, and thus has the potential to affect these PCEs.

As noted in the BA species account, there is limited information on green sturgeon movements, behavior, habitat preferences, or requirements out in the open ocean. Data collected from seven out-migrating green sturgeon tagged with pop-off archival tags in the Rogue River indicates that green sturgeon generally inhabit depths of 40 to 70 meters, and occasionally make rapid ascents to the surface (Erickson and Hightower 2007). Lindley et al. (2008) found that peak migration rates of tagged green sturgeon exceeded 50 kilometers per day during the spring time southward migration. Available information from offshore commercial trawling efforts indicates green sturgeon remain within the 110-meter depth contour line (Erickson and Hightower 2007, National Marine Fisheries Service 2005a). If so, then green sturgeon in the vicinity of the action area are likely migrating between 3.5 km and 30 km offshore, where mean water depths are -40 to -110 m.

"Migratory Corridor" PCE

The WEC and Ocean Sentinel moorings obstruct only a few meters width in this corridor and thus have negligible potential to be perceived by migratory sturgeon; moreover they do not present any greater obstacle than existing features such as rock reefs and thus have minimal potential to present any impediment to sturgeon migration, or to alter the.

The WEC would also produce sound, which hypothetically could alter the marine acoustic environment in a manner that could affect green sturgeon migration. As noted in the BA analysis of hydroacoustic effects for lower Columbia River Chinook salmon, Section 6.1.1.1, there is very little reason to expect the acoustic signal from an operational WEC to be detected by a migrating green sturgeon, with acoustic effects damped to background levels within a short distance of the WEC. Thus acoustic stimuli, like the mooring structures, represent a very small fraction of the width of the migration corridor, with a proportionally small potential to alter green sturgeon behavior. There is, moreover, no evidence that acoustic stimuli per se have the potential to alter green sturgeon behavior. However, as noted in Section 6.1.1.1, there are nonetheless substantial uncertainties regarding potential acoustic impacts of WEC operation, and those impacts would be assessed periodically via an adaptive management process. It would also be appropriate at that time to reassess the potential for acoustic effects to affect green sturgeon migration.

The WEC would also produce EMF, which hypothetically could alter the marine EMF environment in a manner that could affect green sturgeon migration. As noted in the BA analysis of EMF effects for lower

Columbia River Chinook salmon, Section 6.1.1.4, there is very little reason to expect the EMF signal from an operational WEC to be detected by a salmonid, and even a green sturgeon is unlikely to detect EMF effects at a distance of more than about 10 meters (Section 6.1.12). Thus EMF stimuli, like the mooring structures, represent a very small fraction of the width of the migration corridor, with a proportionally small potential to alter green sturgeon behavior. However, as noted in Section 6.1.1.1, there are nonetheless substantial uncertainties regarding potential EMF effects of the proposed project on marine fishes, and those impacts would be assessed periodically via an adaptive management process. It would also be appropriate at that time to reassess the potential for EMF effects to affect green sturgeon migration.

"Water Quality" PCE

No mechanism has been identified whereby the proposed project could affect dissolved oxygen concentrations. Contaminant release from the proposed project is analyzed in detail in the BA, Section 6.1.1.2, and is there found to pose a negligible risk to Chinook salmon, a conclusion reiterated in Section 6.1.12 with regard to green sturgeon. By the same rationale there is negligible potential for the proposed project to affect the PCE for water quality.

"Food Resources" PCE

The proposed project has no identified potential to alter food resources availability except by placement of the physical structure of the WEC and its moorings. Those effects are analyzed in the BA, Section 6.1.1.3, which covers various effects related to project structures. That analysis finds that the proposed project is likely to cause some fish aggregation and may on occasion snag derelict fishing gear. Both of these constitute environmental changes that may locally alter foraging behavior of certain marine organisms, including green sturgeon. However, as explained in Section 6.1.1.3, these effects have minimal potential to appreciably alter fish behavior in the area, particularly in consideration of conservation measures addressing removal of derelict gear, monitoring of benthic habitat, and periodic adaptive management to reassess project effects on marine habitat. In view of these conservation, monitoring, and adaptive management measures, the proposed project has negligible potential to alter the PCE for food resources, and there is moreover high confidence that this conclusion will be periodically reassessed via the adaptive management process.

Literature Cited

Erickson, D.L. and J.E. Hightower. 2007. Oceanic distribution and behavior of green sturgeon. *American Fisheries Society Symposium* 56:197–211.

Lindley, S.T., M.L. Moser, D.L. Erickson, M. Belchik, D.W. Welch, E.L. Rechisky, J.T. Kelly, J. Heublein, and A.P. Klimley. 2008. Marine Migration of North American Green Sturgeon. *Transactions of the American Fisheries Society* 137(1):182-194.

National Marine Fisheries Service. 2005a. Green Sturgeon (*Acipenser medirostris*) status review update. National Marine Fisheries Service Southwest Fisheries Science Center, Santa Crux, California. 31 pp. Available: <http://www.nmfs.noaa.gov/pr/pdfs/statusreviews/greensturgeon_update.pdf>. Accessed: July 27, 2010.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1201 NE Lloyd Boulevard, Suite 1100
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June 21, 2012

Laura Margason
Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

Debra Henry
US Army Corps of Engineers,
Portland District
PO Box 2946
Portland, Oregon 97208

RE: Initiation of formal ESA section 7 consultation for the Department of Energy's Northwest National Marine Renewable Energy Center and Oregon State University Wave Energy Test Facility Project and US Army Corps Engineers Nationwide Permit #5 for Wave Energy Test Project at the Northwest National Marine Renewable Energy Center.

Dear Ms. Margason and Ms. Henry:

This letter acknowledges National Marine Fisheries Service's (NMFS) receipt of the Department of Energy's (DOE) letter and biological assessment (BA) on May 21, 2012 and the US Army Corps of Engineers' letter and submission of the DOE's BA on June 8, 2012 requesting concurrence with an Not Likely to Adversely Affect (NLAA) determination for the following Endangered Species Act (ESA) listed species, critical habitat and essential fish habitats occurring within the project action area.

NMFS does not concur with the NLAA determination because the effects of the proposed action are unlikely to be insignificant or discountable, and are not wholly beneficial. NMFS based this preliminary assessment on the temporal scale (ten years), the risk of entanglement of marine mammals, and the significant uncertainty about sound and electromagnetic fields generated by the project and the resulting effects on marine life. These factors may adversely affect ESA-listed species. Therefore, this letter serves as notice of initiation of formal consultation under Section 7 of the ESA. Section 7 allows NMFS up to 135 calendar days from the receipt of a complete biological assessment to conclude formal consultation and complete our biological opinion (unless NMFS and the action agency mutually agree to an extension). NMFS received your response to our request for additional information dated June 15, 2012, on June 18, 2012. NMFS has determined that the BA and the additional information response provide all the information required from you to initiate consultation or that the information is available from other sources for our consideration and reference. NMFS considers consultation initiated as of

June 18, 2012, the date we received your response to our additional information request. Therefore, we expect to provide our biological opinion to you no later than October 31, 2012.

As a reminder, the ESA requires that after initiation of formal consultation, the Federal action agency may not make any irreversible or irretrievable commitment of resources that limits future options. This requirement ensures that agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitats.

If you have any questions or concerns about this consultation or the consultation process in general, please feel free to contact Kim Hatfield of my staff at 503-231-2315 or Kim.Hatfield@noaa.gov.

We appreciate the efforts the U.S. Department of Energy, US Army Corps of Engineers and Northwest National Marine Renewable Energy Center have made to work with NMFS on the development of the open ocean test program, which will further research and development of alternative energy sources such as wave energy.

Sincerely,

Keith Kirkendall

Keith Kirkendall, Chief
FERC and Water Diversions Branch
Hydropower Division

cc: (Sent electronically, unless noted as "hard copy")
Therese Hampton, PEV
Chris Moelter, ICF
Delia Kelley, ODFW
Debra Henry, Corps
Jeff Everett, USFWS

United States Department of the Interior

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Reply To: 8330.IC0123(12)
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July 27, 2012

Ms. Laura Margason
NEPA Document Manager
U.S. Department of Energy
Golden Field Office
1617 Core Boulevard
Golden, CO 80401-3393

RE: Endangered Species Act Section 7 Informal Consultation for the U.S. Department of Energy's Wave Energy Test Facility Project, Newport, Oregon

Dear Ms. Margason,

This document transmits the Fish and Wildlife Service's (Service) concurrence on the U.S. Department of Energy's (DOE) determination of effects for the Northwest National Marine Renewable Energy Center's (NNMREC) Wave Energy Test Facility Project (Project) on marbled murrelet (*Brachyramphus marmoratus*), Western snowy plover (*Charadrius alexandrines nivosus*), and short-tailed albatross (*Phoebastria albatrus*) in accordance with the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Your request, dated January 11, 2012, for informal consultation, and the accompanying Biological Assessment (BA) was received in this office on January 17, 2012. The Service has participated in a number of meetings regarding the revised development and deployment schedule for the proposed Project, as well as requests for additional information and clarification of the BA.

The proposed Project would enable the final design, construction and initial operation (including deployment) of a wave energy testing facility that would be able to perform off-grid testing of Wave Energy Conversion (WEC) devices. Funding for the proposed Project would be provided by the DOE Wind and Water power Program as well as other funding sources. The proposed Project would allow for testing the output of WEC devices in an open-water setting, studying the environmental effects of several wave energy technologies in off-shore, non-grid connected testing scenarios. Up to two WEC devices and associated instrumentation buoys may be tested at any one time, with deployments ranging from several weeks to 12 months, depending on the nature of the test and the type of WEC being tested.

DOE has determined, and the Service concurs, that the proposed Project may affect, but is not likely to adversely affect, marbled murrelet, Western snowy plover, and short-tailed albatross. Our concurrence with this determination is based on the following:

- The short term deployment and small scale of the WEC devices, associated instrumentation buoys, anchors and mooring systems, and deployment vessels.
- Marbled murrelets may use the Project area for foraging and loafing during the times that the project will be in the water, however based on the size of the WEC devices and the associated instrumentation buoys, along with their mooring, operations, monitoring and decommissioning plans, the Project presents an insignificant risk of collision or entanglement for this species.
- There are few observations of short-tailed albatross off the Oregon coast, with none of those observations occurring closer than 20 miles to shore (Nehls 2003). The Project is 2 miles off shore, well away from all observations of short-tailed albatross.
- No Project activities will occur on shore, where Western snowy plover and its habitat occurs.

This concludes informal consultation pursuant to section 7(a)(2) of the Act. If information reveals the action may affect listed species in a manner or to an extent not considered in this consultation; the action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this consultation; and/or a new species is listed or critical habitat is designated that may be affected by this action, DOE may need to re-initiate consultation.

The Service supports the responsible development of renewable energy resources, and promotes a balanced approach to the testing and deployment of new technologies with the conservation of species of concern and their habitats. If you have any questions, please contact Jeff Everett or Doug Young at (503) 231-6179.

Sincerely,

For Paul Henson, Ph.D.
State Supervisor

cc: NMFS Northwest Region (Hatfield)
Pacific Energy Ventures (Klure)
Oregon DSL (Casteli)
Oregon DFW (Kelly)

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1201 NE Lloyd Boulevard, Suite 1100
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August 2, 2012

Laura Margason
Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, CO. 80401-3393

Debra Henry
US Army Corps of Engineers,
Portland District
PO Box 2946
Portland, OR 97208

RE: Endangered Species Act Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the for the Department of Energy's Northwest National Marine Renewable Energy Center and Oregon State University Wave Energy Test Facility Project Funding and US Army Corps Engineers Nationwide Permit #5 for 2012-2013 WET-NZ Wave Energy Test Project at the Northwest National Marine Renewable Energy Center Test Site.

Dear Ms. Margason and Ms. Henry:

The enclosed document contains a biological opinion (opinion) prepared by National Marine Fisheries Service (NMFS) pursuant to Section 7(a)(2) of the Endangered Species Act (ESA) on the effects of the Department of Energy's funding for the Northwest National Marine Renewable Energy Center and Oregon State University Wave Energy Test Facility Project and US Army Corps Engineers Nationwide Permit #5 authorization for the 2012-2013 WET-NZ Wave Energy Test Project at the Northwest National Marine Renewable Energy Center Test Site.

In this opinion, NMFS concludes that the proposed action is not likely to jeopardize the continued existence of Lower Columbia River, Upper Willamette River, Upper Columbia River spring-run, Snake River spring/summer, Snake River fall, California Coastal, Sacramento River winter-run, or Central Valley spring-run Chinook salmon; Lower Columbia River, Oregon Coast, Southern Oregon/Northern California Coast, or Central California Coast coho salmon; Southern Distinct Population Segment (DPS) of North American green sturgeon; Southern DPS eulachon; Southern Resident killer whales; Steller sea lions; or humpback whales, or result in the destruction or adverse modification of their respective designated critical habitats. NMFS also concluded that the proposed action is not likely to adversely affect Snake River, Upper Columbia River, Middle Columbia River, Lower Columbia River, Upper Willamette River, South-Central California Coast, Central California Coastal, Northern California, or California Central Valley

steelhead; Snake River sockeye or Columbia River chum salmon; Sei, blue, fin, or sperm whales; leatherback sea turtles or their critical habitat, or green, olive Ridley or loggerhead, sea turtles.

As required by Section 7 of the ESA, NMFS is providing an incidental take statement (ITS) with the opinion. The ITS describes reasonable and prudent measures NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements, that the Federal action agency must comply with to carry out the reasonable and prudent measures. Incidental take from actions that meet these terms and conditions will be exempt from the ESA's prohibition against the take of listed species.

This Opinion also includes the results of our analysis of the actions likely effects on essential fish habitat (EFH) pursuant to Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). NMFS does not have any MSA conservation recommendations as we have not identified any potential adverse effects on EFH.

Please direct questions regarding this opinion to Kim Hatfield, NMFS FERC and Water Diversions Branch of the Northwest Region Hydropower Division at 503-231-2315 or Kim.Hatfield@noaa.gov.

We appreciate the efforts the U.S. Department of Energy, US Army Corps of Engineers and NNMREC have made to work with NMFS on the development of the open ocean test program which will further research and development of alternative energy sources such as wave energy.

Sincerely,

FOR

William W. Stelle, Jr.
Regional Administrator

cc: (Sent electronically, unless noted as "hard copy")
Belinda Batten, NNMREC
Meleah Asford, NNMREC
Justin Klure, NWEI
Therese Hampton, PEV
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