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

Southwest Region
777 Sonoma Ave., Room 325
Santa Rosa, CA 95404-4731

April 30, 2010

In response, refer to:
SWR/F/SWR3:DKW

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426

RE: NOAA's National Marine Fisheries Service's Comments on the Draft Pilot License Application for proposed Humboldt WaveConnect Project (P-12779-005).

Dear Secretary Bose:

NOAA's National Marine Fisheries Service (NMFS) appreciates the opportunity to comment on Pacific Gas and Electric Company's (PG&E) Draft Pilot License Application (DPLA) for the Humboldt WaveConnect Project (FERC No. 12779-005). NMFS' comments on the DPLA are enclosed.

The DPLA states in several places that PG&E has initiated consultation with NMFS. To clarify, NMFS has not begun consultation on this project under the Endangered Species Act (ESA) or Marine Mammal Protection Act (MMPA). To date, NMFS has not received a request for initiation of consultation under the ESA or MMPA. Along with the other stakeholders, we are working cooperatively with PG&E in the development of the project description, studies and information needs, and are, therefore, providing technical assistance at this time.

FERC has designated PG&E (the license applicant) as the non-Federal representative for section 7 of the ESA, and recommended that PG&E begin informal consultation with NMFS as required by section 7 of ESA (75 FR 11151, March 10, 2010). NMFS requests that PG&E provide NMFS with contact information for the PG&E lead for informal consultation. The primary NMFS contact during informal consultation for FERC hydrokinetic licensing is David White (Southwest Region Habitat Conservation Division) who will coordinate with NMFS' Laura Hoberecht (Magnuson-Stevens Fisheries Conservation and Management Act [MSA] and Essential Fish Habitat [EFH]), Diane Ashton (fish and designated critical habitat, ESA), Monica DeAngelis (marine mammals, ESA, and MMPA), and Kathryn Kempton (General Counsel).

Numerous NMFS trust resources are likely to occur within the proposed project area. We appreciate your assistance in ensuring the information we need is included in the final pilot

license application to facilitate ESA section 7 consultation, EFH consultation, MMPA actions, consideration under the Fish and Wildlife Coordination Act, and provision of terms and conditions for the license.

Please direct your questions relating to these comments to David White at 707-575-6810 or david.k.white@noaa.gov.

Sincerely,

Richard L. Wantuck
Regional Hydropower Program Supervisor
Habitat Conservation Division

Enclosure: NMFS Comments on PG&E's Draft Pilot License Application

cc: FERC Service List
Irma Lagomarsino, Arcata NMFS
Chris Yates, ARA-PRD, NMFS, Long Beach, California
Bob Hoffman, ARA-HCD, NMFS, Long Beach, California
Mark Helvey, ARA-SFD, NMFS, Long Beach, California

Enclosure

NOAA'S NATIONAL MARINE FISHERIES SERVICE'S COMMENTS REGARDING PACIFIC GAS AND ELECTRIC COMPANY'S DRAFT HUMBOLDT WAVECONNECT PILOT LICENSE APPLICATION FERC NO. 12779-005

Executive Summary

NOAA's National Marine Fisheries Service (NMFS) appreciates the opportunity to participate with the Pacific Gas and Electric Company (PG&E or the Applicant), the Federal Energy Regulatory Commission (FERC or the Commission), and the other resource agencies and stakeholders (all parties together collectively referred to as the Humboldt Working Group (HWG) in pre-application technical assistance for the Humboldt WaveConnect Pilot Project (HWCP). Within FERC's expedited pilot project application process to date, the HWG has made significant progress in a very short time towards the development of a final pilot license application (FPLA), including the draft pilot license application (DPLA) which is the subject of these comments.

PG&E's DPLA represents a substantial, comprehensive effort on behalf of the Applicant and the HWG. The DPLA includes most of the major elements required by FERC. However, FERC also requires that the DPLA be sufficient to support environmental analysis. The DPLA is not currently sufficient to support environmental analysis. The environmental report lacks sufficient information to evaluate the existing environment, proposed action, or potential effects of the project on marine resources and their habitats. Baseline studies are not complete and essential elements in the project description have not been finalized, including project license term, wave energy conversion device (WEC) type, and final project location. Project plans proposed for monitoring and emergency shutdown are insufficient to identify species and habitat responses, and a complete suite of adaptive management and safeguard measures to minimize potential adverse impacts have not been developed.

Based on the information presented thus far, the HWCP appears to be a reasonable candidate for FERC's pilot project licensing process. Of concern to NMFS, however, is PG&E's proposed license term, which may be greater than five years. NMFS is also concerned that the Applicant may not successfully develop the information that will be required for section 7 consultation under the Endangered Species Act (ESA) or consultation under the Magnuson-Stevens Fisheries Conservation and Management Act (MSA) within the expedited timeline of the pilot project process. These comments are submitted in the spirit of cooperation and are an effort to facilitate the development of this information and efficient FERC processing of the DPLA. NMFS looks forward to continued cooperation with PG&E and the other members of the HWG towards the development of the final pilot license application.

Document Organization

The first two sections of this document (sections I and II) contain basic information on the HWCP. Most of this material may also be found in the Applicant's preliminary permit application or the DPLA, or was conveyed by PG&E during discussions within the monthly meetings of the HWG. Section III briefly describes NMFS' relevant authorities for this process. NMFS has previously provided a more detailed description of these authorities.[1] Section IV contains NMFS' comments. Section IV(A) contains NMFS' comments regarding PG&E's Project and FERC's eligibility criteria for using the pilot process. Section IV(B) contains NMFS' comments regarding the sufficiency of the DPLA to support environmental analysis. Sections IV(C) through IV(H) contain comments that are page specific to the DPLA text, listed in order of the page of the text referenced.

I. PROJECT LOCATION

The current project boundary encompasses an 18 square mile area off the coast of Northern California, located entirely in state waters. The Humboldt WaveConnect Project (HWCP or Project) will be primarily located within a footprint that is 2.0 nautical miles (nm) long by 0.5 nm wide and located in waters that are between 120 to 145 feet deep. The HWCP will be located between 2.5 and 3.0 nm from the shore of the Samoa Peninsula in Humboldt County. The precise location of this 1.0 square nm area is still under discussion regarding primarily economic and commercial fishing issues.

II. PROJECT DESCRIPTION

The Project would consist of: (1) wave energy converters (WECs) including multi-point catenary moorings and anchors; (2) marker buoys, navigation lights, and environmental monitoring systems; (3) submarine electrical cables extending onshore; (4) land-based power conditioning equipment; (5) an aboveground transmission line and interconnection to the electrical grid; (6) data acquisition and telemetry equipment; and (7) security and safety equipment.

The Project will be a demonstration facility that will host up to four independently-contracted WEC manufacturers. The Project will house up to four berths that will accommodate WECs from independent power providers. WEC types that may be installed include point absorber buoys, attenuator buoys, and floating oscillating water column platforms. There will be no more than 30 individual WECs that use multi-point catenary moorings, and no more than five buried submarine cables. The generating capacity of the Project will be approximately 5 megawatts (MW).

Pacific Gas and Electric (PG&E or the Applicant) has not yet chosen the WEC types to be installed, and NMFS' comments are based on the understanding that the Applicant will present them in the FPLA. Pending final selection of the WEC types, PG&E has proposed a

[1] NMFS' "Response to Request for Information on Threatened, Endangered, and Special Concern Species and Habitats, Pacific Gas and Electric Humboldt WaveConnect Pilot Project License Application" dated June 17, 2009.

conservative "WEC design envelope" for environmental permitting analyses to initiate the application process for a draft license. The environmental impact analyses presented in the DPLA assume that all of these WEC types will be included in the Project and considers the environmental effects of each.

III. NMFS' AUTHORITIES AND RESPONSIBILITIES RELATED TO HYDROELECTRIC PROJECT LICENSING

NMFS has statutory authority for protecting, conserving and managing marine resources under the statutory provisions of the Endangered Species Act (ESA) (16 USC § 1531 et seq.), the Federal Power Act (FPA)(16 USC § 791a et seq.), the Magnuson-Stevens Fisheries Conservation and Management Act (MSA) (16 USC § 1801 et seq.), the Marine Mammal Protection Act, (MMPA)(16 USC § 1361 et seq.), the Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. 661-667e), and Reorganization Plan Number 4 of 1970, 15 U.S.C. §1511. NMFS has previously described our relevant authorities and trust resources in detail in NMFS' Motion to Intervene and Comments (filed April 26, 2010) and NMFS' Response to Request for Information on Threatened, Endangered, and Special Concern Species and Habitats (filed June 18, 2010).

IV. COMMENTS

A. Criteria for Using Pilot Licensing Process

The criteria set out in FERC's White Paper, *Licensing Hydrokinetic Pilot Projects*, [2] are that the pilot projects will be: (1) small; (2) short term; (3) not located in sensitive areas based on the FERC'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. NMFS provides comments regarding the HWCP and these criteria below and in the following section.

1. Small

The FERC white paper states that pilot projects will be less than 5 MW. In addition, staff will also consider the number of generating units and project footprint. PG&E's Project will produce less than 5 MW, will include up to 30 generating units, and its physical structures will occupy approximately one square nautical mile (plus additional area for submarine transmission lines and shore facilities).

The Project is within the upper limit of FERC's generation criterion. Given that the HWCP will serve as a platform for the testing of up to four WEC types of various sizes, NMFS accepts that 30 generating units is a reasonable estimate of how many units can be installed within the 5 MW

[2] The whitepaper is available at http://www.ferc.gov/industries/hydropower/indusact/hydrokinetics/pdf/white_paper.pdf (April 14, 2008, revised February 4, 2009) (last visited January 28, 2010).

criterion. We note that the average unit rating for 30 units, using the 5 MW criterion, is 167 KW.

NMFS questions whether the project footprint could be considered small. In NMFS view, the project "footprint" is not limited to the 2-dimensional, physical boundaries described by the perimeter of the water surface area. Because extensive cables, moorings, and subsurface transmission lines are also involved, the actual project footprint extends 3-dimensionally beneath the surface of the ocean and along the affected areas of the ocean floor. Moreover, regarding fish and marine mammals, the project footprint includes potential acoustical and electromagnetic zones of influence. This represents the areas surrounding the project installations where emitted sound or pressure waves, or residual electromagnetism, may cause behavioral or physiological responses or other impacts to marine species and organisms of concern. Thus, a project's effective zone of influence may be significantly larger than the 1 square-mile structural footprint. Because baseline noise and electromagentic studies have not yet been completed, NMFS cannot fully evaluate the magnitude or importance of these potential effects at this time. NMFS suggests that without this information, the Commission would have difficulty substantiating a decision as to whether the project footprint is small.

During the period of its preliminary permit, PG&E has made concerted efforts to refine and reduce its project area. This included PG&E requesting FERC amend its preliminary permit project boundary from 136 square mile area to the current 18 square mile area. Also, PG&E is currently finalizing the location of the one square nautical mile Project within this reduced project boundary while taking into account important stakeholder issues.

2. Short Term

The FERC white paper addressed the short-term criteria as follows: "Though evaluated on a case-by-case basis, staff expects that pilot projects will have terms of five years."

PG&E's "Notice of Intent to File a Pilot Project License Application" (February 26, 2010) states "the HWCP will be limited in duration, with a proposed license duration of five years." Within the DPLA, however, PG&E states that it envisions its license term including "2 years for equipment procurement and installation, 5 years for operation, and 1 year for decommissioning" for a total of eight years. PG&E states that because this is the first project of its kind in the United States, some uncertainties will need to be resolved regarding detailed design and economics, and that additional time for operating the project may be requested in the final pilot license application.[3] Within stakeholder meetings, PG&E has contemplated a possible 13-year license term, including ten years of operation and three years for installation and decommissioning (February 2, 2010 Permitting Authority Subcommittee Meeting Summary).

FERC's short term criterion is presumably in place as a required safeguard because of the experimental nature of the technology and the streamlined pilot project permitting process. In the pilot license process, an applicant may (and PG&E has, in this case) request a waiver from completing certain steps normally required within the Integrated Licensing Process (ILP) to develop project information. However, additional emphasis is placed on monitoring and

[3] Draft Pilot License Application Exhibit E Executive Summary, page ES-1; Exhibit E 3.0, page 3-1; Exhibit E 6.2 page 6.1.

adaptive management during the pilot project license term, and the project may be shut down immediately in the case of unforeseen consequences.

With respect to NMFS' regulatory processes, a five-year license term may be a fundamentally different temporal frame of reference for analysis during NMFS section 7 consultation and MSA consultation than either an eight or thirteen year license term. Assuming two years for procurement and construction and one year for decommissioning is constant regardless of the period of WEC operation, then the actual period of in water operation would vary between two years (for a five license), five years (for an eight year license), and ten years (for a 13-year license). Thus, exposure and risk to a Pacific salmon or green sturgeon ESU/DPS[4] escalates significantly as the operational period is extended. Such an extended time of operation increases level of potential risk to the species. Hence, additional environmental analyses and scrutiny is required if license terms are increased. The difference includes not just the project's scale in time and space, but also the degree of repeated exposure and risk associated with direct and indirect effects to the number of generational cohorts affected.[5] For instance, two years of in water operation may affect two successive salmon or steelhead cohorts once, but ten years of operations may also affect the progeny of three year classes twice more in succession. Likewise, the difference between two and ten years of experimental operations may have a proportionally greater impact on multiple cohorts of green sturgeon and their designated critical habitat, as well as repeated exposure to plant and animal species within designated Essential Fish Habitats.

The relationship between length of license term and potential adverse effects is not always linear in time and space. We offer four hypothetical, yet realistic cases to illustrate this point:

- In terms of extinction risk for ESA-listed salmonid or green sturgeon populations, exposing all year classes to repeated risks threatens that population significantly more than exposing only some of the year classes.
- Delaying migration to a certain degree may be insignificant or harmless, but delaying a bit more may exceed critical physiological or seasonal thresholds where important life cycle processes are interrupted or reproductive success is diminished.
- Certain effects may be episodic in nature , perhaps not occurring at all before a certain intensity of the stimuli is reached (such as fish attraction effects), and then may occur suddenly at a significant magnitude.
- The probability of interaction and impact increases for a particular species when the project's zone of influence intersects directly with particular habitat types and migration routes; and impacts diminish when projects are located beyond, or at the periphery of important habitat and species assemblages.

As a result, the outcome of the consultation process for a five year term may not be a proper foundation for an order extending the license term for a period of even a minimal number of years following the initial licensing term. Depending on the specific circumstances,

[4] These acronyms are terms related to the Endangered Species Act. ESU=Evolutionarily Significant Unit. DPA=Distinct Population Segment.

[5] As used here, a **generational cohort** is defined as the group of individuals, within a population of a species of concern, who experience the same event within the same time interval.

consultations may have to be re-initiated, or authorizations renewed, due to changed conditions or new information that becomes available during the term of a license.

PG&E also proposes acoustic and visual monitoring of marine mammals for not more than one year after installation "because the project and effects are short term (5 years), and monitoring is focused on assessing effects of the project rather than on determining long-term variability of marine mammal distribution in the project area" (DPLA Appendix E-5.3.4, Page 3). NMFS reminds FERC that, among other potential impacts, any adverse effects on marine mammal habitats and behavioral movements are of paramount interest to NMFS. In order to provide coverage under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA), NMFS will require additional monitoring beyond one year, especially if a longer term is sought, as well as greater detail regarding the measures and assurances that the Project can be shut down or modified on short notice. Detailed comments are provided in the following sections.

NMFS regulatory requirements are not different with respect to the pilot project license process than any other action: An applicant can apply for a longer license term; however, it is the applicant's responsibility to provide a project description that is adequate to initiate consultation. As license term and therefore exposure and risk to NMFS' trust resources increases, detail in the project description will need to increase for NMFS to be able to responsibly assess risk. Greater risk requires increased certainty in risk assessment. In addition, an eight or ten year term would appear inconsistent with the intended purposes of the pilot license process unless baseline information and monitoring requirements were commensurately increased.

To date, stakeholders have not been substantially included in the development of project baseline studies, including related studies currently underway at Humboldt State University, and detailed baseline information has not been presented. This issue is further addressed on page 7 of this document in the section entitled "Description of the Existing Environment." While NMFS will continue to work with PG&E to identify information needs, we are uncertain if the Applicant will be able to develop an adequate project description during the term of the application process, especially if a longer term is sought.

3. Sensitive Area

As detailed in our "Response to Request for Information on Threatened, Endangered, and Special Concern Species and Habitats, Pacific Gas and Electric Humboldt WaveConnect Pilot Project License Application, P-12779" dated June 17, 2009, numerous listed species are likely to occur within the proposed Project area and many more may occasionally occur within the Project area. These include but are not limited to several species of anadromous fish, marine mammals, and turtles. In addition, the project site is located within an area identified as Essential Fish Habitat (EFH) for various life stages of fish species managed and monitored under the following Fishery Management Plans (FMP) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Of particular concern to NMFS, the Project is to be located within the migratory corridor of gray whales and proposed critical habitat of the Southern Distinct Population Segment (DPS) of the threatened North American green sturgeon.

To date, NMFS has not been substantially included in the development of project baseline studies that would inform our understanding of the sensitivity of the Project area. However, the proposed area is not within a national marine sanctuary or any Federal habitat areas of particular concern (HAPC).

4. Removable and able to be Shut Down on Short Notice

FERC provides in its 2008 White Paper "Licensing Hydrokinetic Pilot Projects" that "Unacceptable risks to the public or the environment during the license period, as observed through monitoring protocols required by the license (or as otherwise becomes evident), will lead to project alteration, shut-down, or removal followed by site restoration.[6] The DPLA does not provide sufficient Project description on this topic. The DPLA states that "selected equipment will include remote shutdown capabilities (Exhibit A, Page A-1)."

The FPLA needs to be clear on the definition of the unacceptable level of harm, unforeseen risk to environmental resources, and significant, unforeseen, adverse environmental effects that will trigger project modification, shutdown or removal. NMFS recommends that PG&E, resource agencies, and HWG collaborate to define these sideboards for the purposes of this Project. If the Commission intends to define these sideboards, NMFS requests that the Commission inform PG&E and NMFS of those definitions. This will include identification of specific environmental thresholds or triggers requiring changes in project monitoring, project modification, shut down, or removal, as well as the identification of an acceptable individual or group of individuals that will determine when these thresholds have been reached.

5. Removed, with the Site Restored, before the End of the License Term

The DPLA includes the statement that "[t]he decommissioning phase will begin once the license term has expired. Decommissioning will involve removal of the HWCP components, and any necessary remediation or restoration of the project site components. Decommissioning is expected to take approximately 1 year…Components will be removed as required by the terms and conditions of the FERC license and all disturbed surfaces will be returned to pre-project condition insofar as practicable." NMFS points out that the decommissioning phase needs to be completed within the license term.

6. DPLA Adequate for Environmental Analysis

The DPLA provides "A draft Biological Assessment for the HWCP is provided in Appendixes E-5.3.6A, B, and C **(**Exhibit E, Page 4-9) and "Section 5.3.3, Marine Fish and Aquatic Resources, of this Exhibit E serves as the EFH assessment for the HWCP" (Exhibit E Page 4-12).

While PG&E, the resource agencies and stakeholders are working cooperatively and consistently towards the development of the FPLA, the DPLA is not currently in a form that is adequate to support a draft biological assessment for ESA or MSA consultations**.** NMFS will continue

[6] Licensing Hydrokinetic Pilot Projects, FERC 2008 (Page 4). Available at: http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics/pdf/white_paper.pdf

working with PG&E to develop the necessary information for consultations as well as for environmental analysis as outlined in FERC's 2008 White Paper "Licensing Hydrokinetic Pilot Projects."

NMFS provides additional comments in the following section entitled "Completeness of Information in the Draft Pilot License Application" and provides page specific comments in the subsequent "Detailed Comments" sections.

B. Completeness of Information in the Draft Pilot License Application

FERC provides in its 2008 White Paper "Licensing Hydrokinetic Pilot Projects"[7]:

> The pilot project DPLA must be sufficient to support environmental analysis. The application should include (1) a thorough description of the existing environment; (2) details of the project proposal; (3) potential effects of the proposal; (4) proposed plans for (a) monitoring, (b) safeguarding the public and environmental resources, (c) and assuring financing to remove the project and restore the site; and (5) consultation record.

PG&E addresses information needs (1) through (5) in the DPLA. NMFS provides general comments on each of these issues in this section, as well as page specific comments in the subsequent Detailed Comments sections.

1. Description of the Existing Environment

To date, NMFS has not been substantially included in the development of project baseline studies, and baseline studies are not complete. Therefore, description of the existing environment is not complete. Project effects cannot be understood without adequate baseline information against which to measure any changes.

NMFS requests that PG&E engage resource agencies in the development of baseline studies immediately. Agency involvement to date has been very limited. During the January 6, 2010 meeting, PG&E first mentioned (1) meeting with Humboldt State University (HSU) President Rollin Richmond, who interviewed faculty members to find what research projects might be useful to the project's pre-installation phase; (2) RFPs were released in August 2009; (3) many proposals were submitted in October 2009.; (4) PG&E was finalizing contracts; and (5) all studies will be complete by the end of 2010. Although it was a continuing action item for PG&E, the studies that were funded by PG&E were not provided to NMFS until April 8, 2010.

Because PG&E did not initially inform or coordinate development of HSU baseline studies with HWG, as well as the delay in sharing the content of the studies with the HWG, study results may not be sufficient to provide a satisfactory description of the existing environment and to serve as the baseline against which project effects can be measured.

[7] Licensing Hydrokinetic Pilot Projects, FERC 2008. Available at: http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics/pdf/white_paper.pdf

2. Details of the Project Proposal

While PG&E is actively engaged in developing a project that is acceptable to a diverse group of stakeholders as well as numerous resource agencies, PG&E's DPLA does not include several key project details. PG&E does not present a final selection of WEC types in the DPLA. Instead, PG&E proposes a conservative "WEC design envelope for environmental permitting analyses to initiate the application process for a draft license" (Exhibit E Page 3-3). PG&E has not requested a definite license term, with descriptions from five years to thirteen years including installation and decommissioning. Finally, PG&E is still in discussions regarding final location of the Project within the permitted boundary.

Description of the proposed action, including construction and operation, are not adequate for analyses as presented. NMFS will require more detailed project description for ESA and EFH consultation. WEC type, project location and term will need to be described in detail. Monitoring and adaptive management plans and decommissioning details will need to be developed and provided. For EFH, PG&E will need to provide specific information regarding areas or ranges of areas that will be affected: area of benthic disturbance per anchor, number of anchors, areas of benthic disturbance by cables, area of hard substrate added to water column, and so on.

3. Potential Effects of the Project

The DPLA does not contain sufficient information or analysis for a draft biological assessment. Because of the wide range of WEC specifications provided (Table 3.2-2, Exhibit E Page 3-13), lack of baseline information, and current lack of understanding of the effects of operation of the WECs, the effects analysis is incomplete.

For NMFS to complete section 7 consultation, the proposed action needs to be deconstructed, all potential stressors (effects) associated with the activities identified; the spatial and temporal exposure of individuals or habitats to the stressors described, the response of the individuals to the stressor described, and the risk of harm, injury or mortality to the individuals determined, and the effects of the action on the listed species populations, and ultimately the evolutionarily significant unit/distinct population segment, are analyzed.

For consultation under the MSA, the horizontal and vertical footprints of an individual WEC, as well as the combined footprints of WEC Arrays, needs to be provided in order to determine the amount and nature of project alteration of the benthic habitat as well as habitat in the water column. In addition, the FPLA will need to identify what effect, if any, the presence (as well as operation and maintenance) of the WECs has on organisms that are currently existing in pelagic habitat without structures. The relationship of project-generated EMF values to ambient or background EMF, the ability to detect the values, and how project-generated EMF values from transmission lines in both the water column and in the benthic substrate may affect fish behavior needs to be discussed further before developing a final monitoring plan.

FAD Effects: NMFS recommends monitoring of fish populations in the HWCP site and control sites prior to construction to determine fish attraction (FAD) effects. Once the appropriate

questions and hypotheses are developed, sampling methodology and frequency will likely need to be modified and should be developed transparently among PG&E and resources agencies and other interested take holders as appropriate. As a FAD, the WECs could attract listed fish by attracting their prey, directly attract listed fish, as well as attract predators of listed fish (fish, seabirds, and marine mammals). A more general question could be "Do the WECS attract animals?" Conversely, a similar question could be "Do WECs repel animals?" Noise and lighting associated with operation of WECs may generate noise that will alter behavior of fish, potentially contributing to the FAD effect or attracting predators. A clear flow chart showing the interrelationships of these variables and how they will be tested will be useful in developing the plan. Where appropriate, the potential for learning from studies elsewhere should also be included.

4(a). Proposed Plans for Monitoring and Adaptive Management

As described in the DPLA, "The adaptive management approach will answer monitoring questions that support specific issues of concern, as identified through meetings with agency staff and the Humboldt Working Group" (DPLA Exhibit E, Page 6-2). The Monitoring and Adaptive Management Plan for Fish and Invertebrates includes "This document addresses the uncertainty surrounding these issues by following a stepwise monitoring and adaptive management plan. The Plan includes provisions to increase, decrease, or halt the monitoring depending on the results. The plan also provides opportunities to modify the project, if or as necessary, to reduce observed or predicted impacts that are indicated by the monitoring" (DPLA Appendix E-5.3.3 at Page 1).

The current monitoring plans provide a good starting place for PG&E and the resource agencies to continue developing robust yet lean plans to ensure that monitoring is adequate to detect a difference in measured parameters before and after installation of the WECs. The plans are not, however, adequate to confirm or dismiss potential effects of the project. Baseline conditions are not adequately described, as baseline studies are not complete. Therefore, monitoring efforts do not have clear standards to measure changes against. The Adaptive Management component of each plan is largely missing. Specifically, thresholds and triggers that will activate adaptive management are missing, as are the specific adaptive management measures themselves. Costs associated with monitoring plans are not included in HWCP estimated operation and maintenance costs (DPLA Exhibit A, Table A-2) or elsewhere. Finally, monitoring and adaptive management plans need to include details about how reporting will be carried out, such as how often reports will be generated, by whom, and to whom will they be distributed. These are all details that need to be provided in the FPLA.

The risk of entanglement provides an example. What is present condition? What is current risk of contact or entanglement of marine species in project area? Is there something about the WEC system design that would change the present condition and if so, can the proposed monitoring detect this change? Would the risk of contact or entanglement increase and what aspect of the monitoring detects this increase (or is it assumed that presence of animals equals an increase in risk)? If an increase is detected, what will be done in terms of adaptive management? Who will be notified and how frequently?

North American Green Sturgeon: A thorough discussion between the Applicant and NMFS is warranted regarding the monitoring and adaptive management plan for green sturgeon. NMFS appreciates that a great deal is unknown about the migration of green sturgeon, and that the draft plan represents a legitimate starting point for discussions. The plan, which will be an integral part of the ESA consultation for green sturgeon, will need extensive development before it is acceptable to NMFS. Key discussion issues include the proposed seasonal deployment of sensors which will miss a substantial portion of the migration (if not the majority), inappropriate thresholds, and possible proactive mitigation. As currently drafted, the plan is inadequate to detect potential adverse effects on green sturgeon because of test design and threshold issues. It is incumbent upon the Applicant to prove the absence of project adverse effects on ESA-listed species. In the absence of the development of adequate information regarding baseline conditions and potential project effects, NMFS will apply a precautionary principle towards the protection of listed species.

NMFS has data that indicates that the majority of green sturgeon going north from San Francisco Bay travel past the Point Reyes in December and January. The majority going to the south travel past Point Reyes in January. Therefore, removing the sensors for the winter months will apparently miss both the northward and southward migrations.

Because only a small percentage of the green sturgeon population has been or will be tagged, a measure of the number of tagged fish encountering the project is irrelevant as a decision criterion for continuation of monitoring. NMFS is concerned about effects to individuals, so the presence of one individual is enough to trigger monitoring. Because so few fish are tagged, and the variation in WECs and their arrays will alter the EMF in the four or five active cables, the monitoring plan should accommodate use of acoustic arrays for the entire life of the project to accommodate potential responses to varying levels of power generation. The monitoring plan needs to specify how migration delay will be detected.

Sea Turtles: Additionally, monitoring and adaptive management measures for sea turtles are missing. It appears that the Applicant has assumed that there will be no effect on sea turtles and thus monitoring is not required. The Applicant is not covered for take of sea turtles for this Project under the MMPA. The FPLA should include monitoring for presence/absence of sea turtles to confirm that they are not in the project area before and also post-installation. Monitoring post-installation helps identify project impacts. For example, without post-installation monitoring, how will it be determined if the Project attracts sea turtles? This needs to be addressed in the FPLA.

NMFS anticipates the final plan will be the result of an iterative, focused and time-intensive collaborative effort among PG&E, the resource agencies, and HWG stakeholders. Clear and shared understanding of the purpose of the monitoring and adaptive management is needed to insure FERC's goals, PG&E understanding and commitment, and NMFS jurisdictional needs, expectations, and assurances are in alignment.

Federal guidance has been provided regarding monitoring plans for hydrokinetic projects. FERC provides in its 2008 White Paper "Licensing Hydrokinetic Pilot Projects"[8]:

> Contents of the post-license monitoring plan should comply with § 5.13 of the Commission's regulations (for study plans) and, in combination with the safeguard plan, should include strategies to detect potential environmental effects of the project and proposed thresholds at which the observed environmental harm would trigger project modification, shutdown, or removal.

The United States Department of Energy provides:[9]

> Expected impacts of a marine/hydrokinetic technology must be clearly framed in one or more testable hypotheses. The level of monitoring should be appropriate to adequately test the hypotheses and refine predictive models using appropriate time and spatial scales. If the methods by which a marine/hydrokinetic facility are installed and operated cannot be satisfactorily evaluated and modified, then adaptive management has no role. Adaptive management should be considered if clear and measurable management objectives can be specified by the regulatory and resource agencies (pre- and post-installation state of water quality, aquatic habitats, and/or aquatic biological communities must be quantified to detect changes brought about by the energy technology.

Summary: Development of the monitoring and adaptive management plans should follow Federal guidance. The plans should include performance standards, including clearly defined thresholds at which the observed risk to public safety or environmental harm would trigger project modification, shutdown, or removal. Costs of the monitoring and adaptive management plan should be specified in the FPLA as an integral part of the project cost. Monitoring and adaptive management plans should include detailed information about reporting. NMFS expects that a license term greater than five years, and the likely variation in types and numbers of WECs in operation, will necessitate changes in frequency or duration of monitoring. Finally, these plans should continue to be informed by consultation with the stakeholders.

4(b). Proposed Plans for Safeguarding the Public and Environmental Resources

Required project safety plans, project removal plan, navigation safety plan, and emergency shutdown and removal plans will be prepared 90-120 days before project construction and therefore are not available for review and comment in DPLA or for FPLA.

The current Safeguard Plan only speaks to the operational attributes of the WECs, not to the public and environmental resources, including performance measures, methods for modification, shutdown, or project removal should potential for an environmental harm be detected.

---

[8] Licensing Hydrokinetic Pilot Projects, FERC 2008 (Page 21). Available at: http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics/pdf/white_paper.pdf

[9] U.S. Department of Energy. 2009. Report to congress on the potential effects of marine and hydrokinetic energy technologies. Prepared in response to the Energy Independence and Security Act of 2007, section 633(B). 143p. http://www1.eere.energy.gov/windandhydro/pdfs/doe_eisa_633b.pdf

Because selected equipment will include remote shutdown capabilities, further ensuring safety and security including environmental resources, an understanding of how quickly WEC operation can be shut down (for both remote and manual controls) is necessary for ESA and MMPA consultations and authorizations.

NMFS recommends that the environmental monitoring triggers for response be integrated into the Safeguard Plan, along with the mechanical and operational triggers for emergency shutdown, *i.e.*, electrical fault, WEC tending to the outside of its watch circle, and communications s degradation (DPLA Appendix A-1, page 5).

4(c). Proposed Plan for Assuring Financing to Remove the Project and Restore the Site

Financing to remove the Project and restore the site should be an integral part of the Project costs and specified in detail in the FPLA. The absence of clear indication that PG&E will support environmentally appropriate removal measures increases uncertainty in the analysis of potential effects on NMFS' trust resources.

5. Consultation Record

The DPLA states in several places that PG&E has initiated "consultation" with NMFS under the ESA, MSA and MMPA (PG&E February 26, 2010 DPLA cover letter to FERC; DPLA at Page 4-1, 4-9, 4-12, 4-12, 4-13, and 8-1; DPLA Attachment C. Stakeholder Outreach Tracking Table, table title). To clarify, section 7 Endangered Species Act consultation has NOT been initiated, and this should be clearly reflected in the DPLA.

The words "initiate informal and formal consultation" used in the DPLA have specific jurisdictional meaning to NMFS in terms of the section 7 ESA consultation. Under 50 CFR §402.14(c), to initiate formal consultation, following a biological assessment, the Commission (through its designated representative), would submit to NMFS a written request to initiate formal consultation, including:

> (1) a description of the action to be considered; (2) a description of the specific area that may be affected by the action; (3) a description of any listed species or critical habitat that may be affected by the action; (4) a description of the manner in which the action may affect any listed species or critical habitat and an analysis of any cumulative effects; (5) relevant reports, including any environmental impact statement, environmental assessment, or biological assessment prepared; and (6) any other relevant available information on the action, the affected listed species, or critical habitat.

Such a request has yet to be made, and for reasons discussed throughout these comments, the information in the DPLA would be insufficient to support the initiation of formal consultation. Along with the other stakeholders, we are working cooperatively with PG&E in the development of the project description, studies and information needs, and are, therefore, providing pre-application technical assistance at this time. NMFS is pleased to provide technical assistance to PG&E and the Commission at any time, but this assistance does not signal that consultation has

begun. To eliminate potential confusion and misinterpretation, NMFS recommends the use of the word "discuss" or "confer" rather than the word "consult" when referring to discussions and meetings with NMFS about the project.

FERC has designated PG&E as the non-Federal representative for section 7 consultation under the ESA, and recommended that PG&E begin informal consultation with the National Marine Fisheries Service (NMFS) as required by section 7 of ESA (75 FR 11151, March 10, 2010). PG&E needs to inform NMFS who the PG&E contact person is for informal consultation. The primary NMFS contact during informal consultation for FERC hydrokinetic licensing is David White (Southwest Region Habitat Conservation Division) who will coordinate with NMFS' Laura Hoberecht (MSA and Essential Fish Habitat), Diane Ashton (fish and designated critical habitat, ESA), Monica DeAngelis (marine mammals, ESA and MMPA), and Kathryn Kempton (General Counsel).

Information transfer from PG&E to NMFS (and other stakeholders) should be timely and efficient, and the procedure should be clear and in writing. NMFS recommends more timely distribution of draft meeting summaries (within 3-5 days) to insure accurate documentation of discussions and understandings.

All meeting summaries should be included in the final license application. Although meeting summaries through December 2009 are included in the DPLA, the meeting summaries for the January 6, 2010, and January 7, 2010, Humboldt Working Group and the Permitting Authority Subcommittee, respectively, were not included in the DPLA.

C. Detailed Comments on Exhibit A: Project Description

1. Page A-1 – PG&E has not yet chosen which types of wave energy converters (WECs) will participate in this project, and states that information on generating units will be provided in the final pilot license application. General information for the most likely WEC types is provided on Page 3-13. NMFS will require final project details (including selected energy converters, final project location, and project duration) in order to complete consultations and authorizations under NMFS' authorities. NMFS will continue cooperatively working with PG&E and the other stakeholders on these issues.

2. Page A-1 – "PG&E anticipates installing up to [document is missing statement here] for WEC array."

3. Page A-1 – "operations are passive and will be monitored from onshore." It is not clear how this statement coincides with the proposed monitoring plans as there is offshore monitoring proposed in the plans.

4. Page A-3, Table A-1, Buoy/Anchor Array seabed surface area – 4,400 to 55,000 square meters (approximately 1-14 acres) is a large range to consider for EFH impacts to benthic environment. Loss of 14 acres of benthic habitat may not be considered negligible.

5. Page A-3, Table A-1, Submarine Transmission Cables – The environmental assessment needs to include an evaluation of the benthic impacts from laying five transmission cables 9 miles long each.

D. Detailed Comments on Exhibit E: Environmental Analysis

Executive Summary

1. Page ES-3, Marine Fish and Aquatic Resources: If project acts as FAD it will change the community structure in the area, not just the predator-prey balance.

2. Page ES-3, Marine Fish and Aquatic Resources: Effects to benthic community will not just be disruption during construction but also loss (4,400 to 55,000 square meters), and changes due to operations and maintenance.

Section 3.0 Proposed Action and Alternative

3. Submarine cables will be installed in the sea floor using standard cable installation equipment (ES-2). The standard cable installation equipment and procedure needs to be described in detail (including pre-installation bathymetric field surveys, trenching procedure and its duration) because of potential effects of those activities.

4. Page 3-17. Need to describe the likely roll-out of array testing, since effects can vary depending on how many devices their spatial arrangement and the duration of their deployment.

5. Environmental mitigation measures are that are part the proposed action need to be clearly identified, described, and likely effectiveness analyzed (*e.g.*, installation of features on the structures to prevent or discourage pinnipeds from hauling out and seabirds from roosting, incorporating deterrent devices (acoustic or visual alerts) into the design of above surface and below-surface equipment if required to prevent collisions**,** frequent monitoring and removal of lost fishing gear or debris; installation of pingers to alert whales).

6. The environmental monitoring plan needs to be an integral part of the proposed action.

7. Page 3-17, Environmental Monitoring and Wave Measurement Buoys: Final sentence says the type of anchor to be used will depend on the geological conditions of the bottom among other things. NMFS needs information about the bottom conditions as well to characterize habitat in the area. This information should be provided to NMFS as soon as available, preferably in the EFH assessment.

8. Page 3-23, section 3.2.3, second paragraph states that bathymetric surveys will be completed prior to installation. This information should be provided to NMFS as soon as available to characterize habitat in the area.

9. Page 3-24, 3rd paragraph: Please provide more detailed information on functioning of standard submarine cable plow for installation of submarine cables (similar to description provided for HDD installation).

10. Page 3-28, 5th bullet: What types of materials will be used for lubricants and hydraulic fluids in the WECs if mineral oils or biodegradable materials are not used. Estimated percentages? Risks associated with all kinds of materials?

Section 4.0 Consultation and Compliance

11. Page 4-8, Table 4.2-1: NOAA's National Marine Fisheries Service authorities pursuant to the Essential Fish Habitat provisions of the Magnuson Stevens Fishery Conservation and Management Act should be included.

12. Page 4-12. Recommend Applicant pursue a Letter of Authorization under the MMPA and/or a scientific research permit.

13. Page 4-12, section 4.2.2 Final two sentences read "Section 5.3.3, Marine Fish and Aquatic Resources, of this Exhibit E serves as the EFH Assessment for the HWCP. Consultation with NOAA Fisheries Service is currently ongoing." While the Applicant has been in discussions with NMFS about the project, official EFH consultation has not been initiated. Further, the contents of this document do not provide sufficient information for EFH consultation.

14. Page 4-13: NMFS consultation is currently not ongoing under the MMPA or ESA.

15. To eliminate potential confusion and misinterpretation, NMFS recommends the use of the word "discuss" or "confer" rather than the word "consult" when referring to discussions and meetings with NMFS to discuss the project. (PG&E February 26, 2010, cover letter to FERC, 4.2.1. Endangered Species Act page 4-9; 4.2.2 Magnuson-Stevens Fishery Conservation and Management Act page 4-12; 4.2.3. Marine Mammal Protection Act pages 4-12 and 4-13; Attachment C. Stakeholder Outreach Tracking Table; table title; Exhibit E 4.0).

16. The DPLA should clearly indicate that section 7 Endangered Species Act consultation has NOT been initiated. The words "initiate informal and formal consultation" used in the DPLA (18 CFR §5.18 Exhibit E 8.0, page 8-1; 18 CFR §4.61(b)(6)(ii) page vi); have specific jurisdictional meaning to NMFS in terms of the section 7 ESA consultation.

17. Exhibit E 4.2.1. Endangered Species Act and 5.3.6.1.3 Threatened and Endangered Species Marine Species Updates. The following updates to NMFS June 17, 2009, letter to PG&E containing the list of threatened and endangered species and designated critical habitat in the vicinity of the PG&E Humboldt Wave Connect project site should be added to Table 4.2-2: (1) North American green sturgeon southern DPS (*Acipenser medirostris*) critical habitat designated (October 9, 2009; 74 FR 52300) http://edocket.access.gpo.gov/2009/pdf/E9-24067.pdf; and (2) Pacific Eulachon southern DPS (*Thaleichthys pacificus*) threatened (March 18, 2010; 75 FR 13012) http://edocket.access.gpo.gov/2010/pdf/2010-5996.pdf.

NMFS (D. Ashton) provided these updates, by email, to Kearns & West (B. Moseley) on April 1, 2010, as well as verbally and by e-mail to PG&E (E. Cheslak and G. Morimoto) on April 7 and April 8, 2010, respectively.

18. Informal consultation is an optional process that includes all discussion, correspondence, etc. between the Service (NMFS) and, in this case, the designated non-Federal representative and is designed to assist the Federal agency (FERC) in determining whether formal consultation is required.(50 CFR§ 402.13(a); 51 FR 19926 June 3, 1986). During informal consultation, NMFS may suggest modifications to the action that the Federal agency and any applicant could implement to avoid the likelihood of adverse effects to listed species or critical habitat [50 CFR§404.13(b)]. The need and requirements for formal consultation are discussed in 50 CFR §402.14,); 51 FR 19926 June 3, 1986), the responsibility to provide best scientific and commercial data available, and additional data are discussed in 50 CFR§ 402.14(d) and (f), respectively.

Section 5.0 Environmental Analysis

5.3.3.1 Affected Environment

19. Page 5.3.2-18, Availability of Water Quality Data, 1st paragraph, last sentence: Please address whether water quality information is available for the single ASBS located in the HBLC, and provide if possible.

20. Page 5.3.2-18, Non-point Sources, first sentence regarding HOODS disposal site within the project area. Please describe how frequently material is disposed of at the site. This is another reason to test sediment chemistry pre-construction.

21. Page 5.3.2-22, Point Sources, second to last sentence regarding potential sediment contamination in project area from historical mill operations. This is why testing pre-construction sediment chemistry is a necessity. For consultation, NMFS will need to know what is currently there to compare with what is there during and after operations to see if things have changed. Without pre-construction testing the HWCP could be held responsible for contaminated sediment in the area caused by pulp mill operations.

22. Page 5.3.2-22, Non-point sources, 2nd paragraph: Please consider that communities associated with shipwrecks in the project area could serve as predictors of species that are likely to aggregate around WECs.

23. Page 5.3.2-23, Table 5.3.2-2: Please describe if the CICORE monitoring stations at Trinidad Head and Humboldt Bay will continue to operate throughout the duration of the project. If not, the Applicant might want to compare the chlorophyll-a and temperature data with SeaWiFS (http://oceancolor.gsfc.nasa.gov/SeaWiFS/). If comparable, the Applicant would have a follow-up data set available.

24. Page 5.3.2-39, Floating particulates, grease, and oil: Please provide an estimate of the maximum amount of material that could be released in a worst case scenario. Since exact

WEC devices are not known, provide estimates for different types of WECs multiplies by number of devices.

25. Page 5.3.3: It would be useful to frame the project area in terms of it nesting within the California Current Large Marine Ecosystem (LME) and the interrelationships of physical and biological systems (*e.g.*, food web linkages; shared prey resources amongst fish, marine mammals, and seabirds; relationship of prey to physical features such as upwelling) especially as it pertains to the listed and protected species. A diagram or flow chart would be especially useful. The physical characteristics that make this location a candidate for wave energy are also the characteristics that make it a highly biologically productive area. For fish, marine mammals and seabirds, this will lay the framework for discussion of the various nested spatial and temporal scales of effects of the proposed action on the listed species which undergo extensive migrations for feeding and reproduction. In addition it can help inform the monitoring questions and identify the opportunities for monitoring efficiencies.

26. Page 5.3.3-1: The amount dredged annually from the Federal navigation channels in Humboldt Bay is incorrect. The Federal navigation channels in Humboldt Bay are routinely dredged to depths ranging from 48 ft to 23 ft depending on location, removing and disposing of up to 2,900,000 cubic yards of dredged material annually (NMFS 2007). *National Marine Fisheries Service. 2007. Endangered Species Act –section 7 consultation. Biological opinion on Humboldt Harbor and Bay Federal Navigation Channel Annual Maintenance Dredging (2007-2011). NMFS Southwest Region. Submitted to U.S. Army Corps of Engineers. 111p.*

27. The dredged material disposal site for the navigation channel maintenance dredging is known as the Humboldt Open Ocean Disposal Site (HOODS). HOODS is 1 nm^2 in size and is located between the 49 meter (m) and 55 m depth contour. It is positioned within the coordinates 40º48’25”N, 124º16’22”W; 40º49’3”N, 124º17’22”W; 40º47’38”N, 124º17’22”W; 40º48’17”N, 124º18’12”W (EPA 1995).

28. Page 5.3.3-3, Pelagic habitat, second paragraph: Please provide what type of data is planned to be collected by PaCOOS at the “Trinidad Head Line” and when will it be available.

29. Page 5.3.3-2, Section 5.3.3.1.4 Benthic Habitat: Please provide if there is there any information on the effects of HOODS (referenced on page 5.3.2-37) to the benthic habitat in the project area.

30. Page 5.3.3-10, Section 5.3.3.1.7 Marine Vegetation: Please consider if ship wrecks in the area (referenced on page 5.3.2-37) provide hard substrate for seaweed to grow on.

31. Page 5.3.3-16: Please add thresher shark to the list of elasmobranchs in Table 5-3-3.4. If the FADs attract bait fish, threshers could hone in on signal and feed on that aggregation. There are large thresher sharks in that area, albeit in small numbers.

32. Page 5.3.3-25, Table 5.3.3-6: A few EFH species are missing. NMFS is not sure what the likelihoods of the missing species are, but since other U species are mentioned, please include in the list:

    i. Missing rockfish: chameleon, freckled, halfbanded, pinkrose, pygmy, swordspine.

33. Page 5.3.3-28, Pacific Groundfish, final sentence: Since this is within section 5.3.3.1.17 Essential Fish Habitat, please mention the habitat features/types in the area that are important to those species listed that have been found in the project area..

34. Page 5.3.3-28: The document references thresher sharks having reproduction habitat to the south of the project area. Please note what literature supports this. NMFS does not know of conclusive literature on actual spawning and nursery habitat for thresher on the west coast, so may consider this speculative.

35. Page 5.3.3-28: The document mentions that adult albacore are generally found further offshore and so will not be in the project area. However, the albacore caught in west coast fisheries are sub-adults, for the most part. In that area, sub-adults are usually targeted by the fishery 5-10 miles or further offshore, except during an El Nino event, in which case the sub-adults can move in closer.

36. Page 5.3.3-28: The affect of El Nino years should be considered regarding distribution, as it affects/alters distribution and abundance of several species.

37. Pages 5.3.3-30 and continuing: The basis for determination degrees of effects in the DPLA (negligible, minor, less than significant, and significant) may, based on the language, be grounded in NEPA. Analysis and determination of effects in DPLA are only made for a five-year project. However, these effects determinations are not consistent with the standards for an adverse effect to EFH. Under ESA, adverse effects to individuals and critical habitat can result and may or may not result in a conclusion of jeopardy or adverse modification.

38. Pages 5.3.3-30 and continuing: The exposure of individual smolts from specific populations within the ESU, and the importance of those populations for recovery, is important when analyzing the effects to the listed salmonids at the ESU scale. NMFS recommends the following publications to aid in this understanding: (1) *T.H. Williams, B.C. Spence, Duffy W. Hillemeier, D. Kautsky, G, Lisle, T.E. McCain, M. Nickelson, T.E. Mora, and T. Pearson. 2008. Framework for assessing viability of threatened coho salmon in the Southern Oregon/Northern California Coast evolutionarily significant unit. NOAA-TM-NMFS-swfsc-432. 113 P.* (http://swfsc.noaa.gov/uploadedFiles/Divisions/FED/Endangered_Species_Act/Salmon_TRTs/TM%20432%20%20Williams%20et%20al_2008.pdf); (2) *E.P. Bjorkstedt, B.C. Spence, J.C. Garza, D.G. Hankin, D. Fuller, W.E. Jones, J.J. Smith, and R. Macedo. 2005. An analysis of historical population structure for evolutionarily significant units of Chinook salmon, coho salmon, and steelhead in the North-Central California Coast Recovery Domain. NOAA TM-NMFS-SWFSC-382. 231 p.* (http://swfsc.noaa.gov/publications/TM/SWFSC/NOAA-TM-NMFS-SWFSC-382.PDF); and (3) T.H. *Williams, E. P. Bjorkstedt, W.G. Duffy, D. Hillemeier, G. Kautsky, T.E. Lisle, M.McCain, M. Rode, R.G. Szerlong, R. S.*

Schick, M.N. Goslin, A. Agrawal. 2006. Historical population structure of coho salmon in the Southern Oregon/Northern California Coasts evolutionarily significant unit. NOAA-TM-NMFS-SWFSC-390. 71 p. (http://swfsc.noaa.gov/publications/TM/SWFSC/NOAA-TM-NMFS-SWFSC-390.PDF).

39. Pages 5.3.3-30 continuing: Effects of cable laying on listed fish and designated critical habitat (*e.g.*, green sturgeon) should be discussed.

40. The DPLA (5.3.4.3. Page 45) states "The effects from noise and vibrations during WEC operations are unknown, and it cannot be anticipated as to how the effects may scale with increasing array size." NMFS will require the evaluation of the effects of noise associated with construction and operation of WECs, as well as operation of multiple WECs, for listed fish and critical habitat as part of a complete project description in the FLPA.

41. Effects to habitat and benthic and pelagic fish species of (noise, turbidity, drilling fluid) associated with horizontal directional drilling (HDD) of each of the five cables needs to be discussed incorporating information from elsewhere in the DPLA.

42. Page 5.3.3-29, Section 5.3.3.2, Potential Effects of the Project on Fish and Invertebrates, final bullet on page states "An effect was considered significant if the exposure and probability of occurring are high, the effects are long term, AND the effects could substantially reduce the number of restrict the range of endangered, rare, or threatened species." According to this, an effect to EFH will never be considered unless listed species will be affected. NMFS suggests adding "or substantially decreases the quality or quantity of EFH."

43. Page 5.3.3-30. Table 5.3.3-7: For all Contaminants sections in the table, it would be useful to distinguish between impacts to water quality versus impacts to sediment chemistry.

44. Page 5.3.3-30. Table 5.3.3-7: For all Noise sections there should be an approximation of time of exposure and level of exposure.

45. Page 5.3.3-30. Table 5.3.3-7, Benthic infaunal invertebrates, Structure: The best estimate of area or range of areas that will be disturbed needs to be provided and made clear so it can be decided if degree of effect truly is 'minor'.

46. Page 5.3.3-31. Table 5.3.3-7: Planktonic invertebrates, Structures: Please also include barriers to migration/movement.

47. Page 5.3.3-31. Table 5.3.3-7, Epibenthic invertebrates, Habitat Disturbance: Please include exact area or range of areas that will be disturbed here. See number 45 above.

48. Table 5.3.3-7: NMFS does not agree with some of the classifications in the "Degree of Effect" column. More detailed comments to be provided.

49. Page 5.3.3-32. Table 5.3.3-7, Flatfish: Please address prey loss or loss of foraging habitat by the placement of structures.

50. Page 5.3.3-35. Table 5.3.3-7, Essential Fish Habitat, Habitat Conversion: Please provide best estimate of area or range of area that will be converted.

51. Page 5.3.3-35. Table 5.3.3-7, Essential Fish Habitat, Change of sediment. Please include change of sediment chemistry from paints, lubricants, etc.

52. Page 5.3.3-35. Table 5.3.3-7, Essential Fish Habitat: Please also include loss of prey or loss of foraging habitat, barriers to movement, and competition with invasive species.

53. Page 5.3.3-36: Please add heading to top of page. NMFS suggests describing the effects in the order they are listed on page 5.3.3-29 to avoid confusion.

54. Page 5.3.3-36, Section 5.3.3.2.1 Contaminants: Please consider the potential for degraded sediment from paints or other potential sources and those benthic invertebrates in area could have long term exposure.

55. Page 5.3.3-37, 2nd complete paragraph: This is the sort of description of the project that is necessary for considering effects and should be included for all of the other sections here, as will be needed for EFH consultation.

56. Page 5.3.3-38, final paragraph, 3rd sentence: The single reference here (Babaran *et al.* 2008) is not significantly relevant. Please include citation with more relevance to justify this statement.

57. Page 5.3.3-39, Section 5.3.3.2.5, Structure, 1st paragraph, final sentence: The Applicant will need to provide the best possible estimate of area or range of areas to consider these impacts for EFH consultation.

58. Page 5.3.3-39, Section 5.3.3.2.5, Structure, 2nd paragraph, 1st sentence: "local but negligible" comparison doesn't make sense. Please explain. Does the Applicant mean large on the local scale but negligible on the scale of km?

59. Page 5.3.3-39, Direct Effects to the Benthic Community: Please include deep sea corals in the list of benthic animals. USGS survey identified fleshy sea pens (*Pennatulacea*) within the project area during their 2009 survey. Sea pens fall in the category of Structure Forming Invertebrates and as such are designated as EFH under the Pacific Groundfish FMP. Additionally, NMFS has discretionary authority under MSA to protect Deep Sea Corals.

60. Page 5.3.3-40, 3rd paragraph, lines 10-11: If project is extended beyond 5 years the scour described here could be considered a permanent loss of benthic habitat. NMFS will need to know the amount of habitat that would be lost to determine if mitigation would be necessary. For the 5 year duration, NMFS would likely consider this a temporary loss of habitat function with recovery expected after removal.

61. Page 5.3.3-40, 3rd paragraph, final sentence: Again, NMFS will need an estimate of the area for the EFH consultation.

62. Page 5.3.3-40, 3rd paragraph, Changes to Marine Community Composition and Predator-Prey Interactions, 2nd paragraph: NMFS will require more detailed information about anchoring and mooring system for EFH consultation.

63. Page 5.3.3-42, 2nd complete paragraph, final sentence regarding EMF frequency unknown: NMFS suggests adding "but will be monitored to determine."

64. Page 5.3.3-43, Section 5.3.3.3 Potential Effects of the Project on Essential Fish Habitat: Please include the following in the list of potential effects: loss of prey, barriers to migration, and colonization by invasive species.

65. Page 5.3.3-43, Section 5.3.3.4 Proposed Environmental Measures: Please include spill prevention and cleanup plan.

66. Page 5.3.3-43, Section 5.3.3.4 Proposed Environmental Measures: NMFS suggests the Monitoring and Adaptive Management Plans are listed here.

67. Page 5.3.3-43, Section 5.3.3.4 Cumulative Effects: Please include some discussion of HOODS here since it has effects on the benthic community and sediment in the area. Also please include a discussion of ballast water exchange if it happens in the area.

68. Page 5.3.3-44, Section 5.3.3.6 Unavoidable Adverse Effects, final sentence: Based on the information provided in this document, NMFS is unable to say that unavoidable impacts to EFH are minor, short term, or less than significant.

69. Page 5.3.3-44, Section 5.3.3.6 Unavoidable Adverse Effects: Changing the duration of the project will mean all of this will need to be reconsidered.

5.3.6 Threatened and Endangered Species

70. Page 5.3.6-71: EFH: Please estimate the area that will be disturbed when the drag anchors are pulled along to set the flukes in the bottom, and describe the likely number of attempts before successful set (based on experience in other similar sediment types). This will allow for analyses of effects of anchor installation on benthic substrates and suspension of sediments into the water column and associated turbidity. Size and composition of gravity anchors will need to be described. Describe the acoustic release and pop-up buoy recovery device to retrieve the cable end when connecting to the WEC device (3.3.2.5). Please describe whether this cable end will be scouring the bottom in general. Please link to Electrical Connection cable discussion (3.2.2.3).

71. Page 5.3.6-76: There are currently no structures of this nature in the project area, and this is the baseline to which the addition of the effects of the project is compared. The reasoning described in the effects section does not support the effects conclusions [Table 5.3.3.7; Structure (5.3.3.2.5); Noise (5.3.3.2.4); Artificial lighting (5.3.3.2.2) and EMF (5.3.6-790].

72. Page 5.3.6-77: Artificial Lighting- Currently, there are no navigation lights or permanent lights of any kind, in the HWCP area. The amount of light from the navigation buoys and

WECs should be quantified. The DPLA (5.3.6.-78) states "Only a small fraction of light output is expected to penetrate the project surface of the water, and a combination of high attenuation and turbidity in the project area will further reduce the quantity of artificial subsurface light." There was no previous mention of turbidity in the project area. The DPLA (5.3.6.-78) also states "Fish attraction to navigational lighting has not been documented despite the widespread use of navigational lighting on buoys and boat vessels worldwide, and a large amount of literature reporting effects of other types of lighting on fish and invertebrates. Therefore, it is unlikely that navigational lights or safety lights will affect threatened or endangered fish species." Lack of previous documentation of attraction to navigation lighting is not a sufficient basis for concluding that these lights will have no effect.

73. Page 5.3.6-78, Structure: NMFS believes it is likely that the WEC array will act as a FAD. NMFS does not believe that the argument presented in the DLPA (5.3.6-78) is sufficient to support the conclusion that the salmonid, sturgeon, smelt species under consideration are unlikely to form even short-term (minutes to hours) associations with project structures. Statements in the DLPA regarding FADs are inconsistent (*e.g.*, ".. the threatened and endangered fish species considered here are not reef-associated species and are not among those species known to associate with FADs, flotsam, or drifting algae."(5.3.6-78); "coho salmon were occasionally associated with floating eelgrass mats in Humboldt Bay" (5.3.6-47); and "the HWCP will function as a FAD" (5.3.3.2.5). The effects of WECs to attract prey, listed fish, and predators of listed fish needs to considered and integrated into the effects analysis.

74. Page 5.3.6-78: EMF- Because the project will allow for side by side evaluation of WECs, the effects associated with a matrix of cables in the water column and along the bottom are likely different than one submarine cable and need to be discussed for the entire period of operation.

75. Page 5.3.6-82: Noise- Sound intensity and frequency spectrum of individual units is (1) likely not the same as multiple units (up to a maximum of 30) in multiple arrays in the four berths, and (2) should be analyzed and monitored accordingly. Effects from installed WECs are of concern to NMFS, as thrumming/strumming of moorings may act to increase FAD effects.

76. Page 5.3.6-82: Please include discussion of the potential effects (*e.g.*, fluctuating EMF and noise) of shutting down and restarting of WEC operations.

77. Page 5.3.6-87: NMFS does not agree that the only potential significant and adverse effects are to marine mammals. Although studies are recommended to determine if electric and magnetic fields could substantially alter the behavior of green sturgeon that occur in the HWCP area (5.3.6-79), there was no mention of such studies in the environmental measures that would help minimize effects on threatened and endangered species that otherwise could be significant and adverse effects (5.3.6.3.3. Special Status Marine Species page 5.3.6-87).

78. Page 5.3.7-8: Because of effects of sonar and other testing on the behavior of marine mammals, the effects of WEC operation during U.S. Navy training exercises may require

special scrutiny [5.37 .1.2 Maritime Uses of Humboldt Bay and Offshore Areas Military Uses U.S. Navy Northwest Training Range Complex (page 5.3.7-8)].

E. Detailed Comments on Appendix IS-1: Distribution List

1. Appendix IS-1 DPLA Distribution List only indicates to whom the documents were sent, not when they were sent. The majority of NMFS Staff (5 of 6, and including the NMFS primary contact), all of whom had requested copies of the DPLA in February, did not receive the document until March 11, 2010. This delay reduced the time to review and prepare comments. In addition the hard copy of the document received by the single NMFS staff on March 1 was incomplete (*i.e.*, Appendix E-5.3.4 Monitoring and Adaptive Management Plan: Marine Mammals missing).

F. Detailed Comments on Appendix A: Safeguard Plan

1. Appendix A-1 Safeguard plan 1.2, page 4. Due to numerous delays in receiving the information, NMFS was only able to provide limited comments and did not participate in the drafting of the plans contrary to the following statement in the DPLA: **"**The Draft and Final Pilot License Applications contain monitoring and adaptive management plans for marine and terrestrial wildlife species that were developed in consultation with the Federal and state resource agencies. The purpose of these plans are to address the uncertainty surrounding potential environmental issues using a stepwise monitoring and adaptive management approach, and depending on the results, the plans provide opportunities to increase, decrease, or stop monitoring. The plans also provide opportunities to modify the project, if or as necessary, to reduce observed or predicted impacts that are indicated by the monitoring"

G. Detailed Comments on Appendix E-5.3.3 Monitoring and Adaptive Management Plan: Fish and Invertebrates

1. Page 1, Issue 1, 2nd sentence: Suggest adding "and change community structure."

2. Page 1, Issue 2, 2nd sentence: Suggest adding "and change habitat and community structure."

3. Page 1, Issue 7, 1st sentence: Suggest adding "and changes in substrate type."

4. Page 1: Suggest adding Issue 8- Noise: Noise from project construction, operation, decommissioning, and associated vessel traffic could affect fish utilization of the area.

5. Page 1: Suggest adding Issue 9: Sediment Chemistry: changes to sediment chemistry from leaching of antifouling paints, device lubricants, and other sources could negatively impact benthic species and the fish that prey upon them.

6. Page 6, 2. Monitoring and Adaptive Management Plans: Each subsection should include a 5th component (*i.e.*, 2.1.5, 2.2.5, 2.3.5, etc.) titled Reporting that describes timeframes, contents, and disbursal of reports associated with each issue.

7. Page 6, FAD Effect, 2.1.1: NMFS recommends that somewhere in this section it is mentioned that these studies will provide information on changes to community structure from the habitat alteration of adding structure to the water column. Documentation of this information will be useful in future assessments of other projects.

8. Page 6 and Page 43. After WEC installation, the study and method (use of gillnets) to study stomach contents of adult piscivorous fish may impact marine mammals. It is not clear in the Marine Mammal Monitoring Plan how monitoring of marine mammals will be accomplished during this study. NMFS requests this is addressed in the marine mammal plan.

9. Page 10, Artificial Reef Effect. 2.2.1: Please address in this section that these studies will provide information on changes to community structure from habitat alteration—especially with comparisons to controls.

10. Page 13, 2.2.2, Monitoring Frequency: Based on the information provided, NMFS does not believe that1 year is a sufficient monitoring. NMFS recommends a minimum of 3 years of monitoring.

11. Page 14, 2.3.1: The text should reflect that sturgeon are moving from overwinter habitats along Vancouver Island to spawning ***and rearing*** habitats in the Sacramento River. Point Reyes array data indicate a portion of the migrating fish is non-spawners.

12. Page 14, 2.3.1: NMFS would like to work with the Applicant on designing appropriate threshold levels. The Applicant should be asking whether project-related electrical and magnetic fields *combined with ambient levels* are detectable, higher than species sensitivity thresholds, and causing adverse effects. This is a subtle but important distinction. While the absolute level of project-related electrical and magnetic fields may alone not cause an adverse effect, the combination of ambient levels plus project-related electrical and magnetic fields (which will always be the case) may cause an effect.

13. Page 14, 2.3.1: In evaluating cumulative effects and possible migratory delay, NMFS will consider the possibility of multiple wave energy projects along the California coastline.

14. Page 14, 2.3.1: NMFS suggests that tagging studies be initiated *before* electric and magnetic field evaluation. Table 2 on Page 19 indicates this is the case, but text on page 14 indicates tagging will be initiated *concurrently*. Please clarify.

15. Page 14, 2.3.1, Question 4: NMFS suggests modification to "Is the proportion of ***tagged*** green sturgeon encountering…"

16. Page 15, 2.3.1: Figure 3 Flowchart for Green Sturgeon EMF Study: NMFS acknowledges that there is much that is unknown about green sturgeon and that determining adverse effects may be a difficult and uncertain prospective. NMFS is open to discussions considering proactive mitigation measures.

17. Page 18, 2.3.1: As on page 14, NMFS believes the thresholds are inappropriate. The appropriate question is "Do the *project EMF levels added to ambient EMF levels* cause an adverse effect?" Please see number 12 above.

18. Page 18, 2.3.1: NMFS will need a year round tagging study. Removing sensors during the winter will miss most, if not all, of the northerly and southerly migrations according to data collected at the Point Reyes array.

19. Page 20, 2.3.1: NMFS does not agree with assumptions and thresholds presented for this study. A more thorough discussion with the Applicant is warranted regarding the monitoring and adaptive management study for green sturgeon.

20. Page 21, 2.3.1: NMFS does not agree that the seasonal deployment of the array would be unlikely to miss many fish. Please see number 18 above.

21. Page 22, 2.3.1: Battery life in currently tagged fish is approximately 10 years rather than the stated 3 to 5 years.

22. Page 28, 2.5.1: There was not enough detail in the document on what species of elasmobranchs have already been tagged for the acoustic monitoring aspect. It states that existing tagged sharks could be detected by the listening stations proposed but if no detections are made then it would be determined that the numbers tagged were too low. NMFS suggests making that determination now and laying out how many and what species are tagged, when they were tagged, and what areas they were tagged in. Some contemporaneous supplemental tagging of sharks in the project area may be necessary to have a large enough sample size to make any conclusions.

23. Page 31, Tagging Study: NMFS suggests that the number of individuals that have been tagged could be found out before the study is designed.

24. Page 32, Biofouling: WEC components also provide structure for invasive establishment. NMFS requests that this is addresses, including whether or not cleaning/antifouling paints makes this a non-issue.

25. Page 34, top of page: Please consider if any collections will occur at shell mounds?

26. Page 34, final paragraph, 3rd sentence: Please clarify if larger samples or greater number of samples is more appropriate.

27. Page 39, Grab Sampling, 1st paragraph, line 9: Please provide justification for only sampling the top 2 cm for toxicity.

28. Page 39, Grab Sampling, 1st paragraph, final sentence: Please describe to what taxonomic level identification will occur. Also, please include "enumeration" and "life stage estimation" here.

29. Page 39, Grab Sampling, 2nd paragraph: Please include water quality monitoring associated with grab sampling.

H. Detailed Comments on Appendix E-5.3.4 Monitoring and Adaptive Management Plan: Marine Mammals

1. Page 2: It is not clear that the baseline information and the proposed monitoring will reveal a change. For example, when trying to assess the risk of entanglement, what is present condition? What is current risk of entanglement in project area? Is there something about the WEC system design that would change the present condition and if so, can the proposed monitoring detect this change? Would the risk of entanglement increase and what aspect of the monitoring detects this increase (or is it assumed that presence of animals = increase in risk)?

2. Page 3: It is unclear how visual observations would allow for the assessment of potential exposure to noise.

3. Page 3: NMFS recommends changing the text to "1) Monitor for presence/absence of marine mammals; 2) Does the presence of the animal increase their risk of entanglement/noise/haul out," etc.

4. Page 3: Rather than assessing cetacean/pinniped exposure to entanglement, NMFS suggests assessment should be for *risk of* entanglement. Please clarify how the baseline monitoring will achieve results necessary to expose a change (or non-change) once the WECs are installed.

5. Page 3: Please clarify if this is an assumption and, if so, provide additional explanation: presence of animals=entanglement [# of animals + # gear = likelihood of exposure].

6. Page 3: It is not clear if the techniques will be cross-cutting: *i.e.*, assessing presence of animals is in all issues and the techniques to assess would be appropriate for presence/absence of some (including fish), but not all.

7. Page 3: Suggest possibly using infrared cameras to detect hauled out animals or migrating whales (*i.e.*, the heat from the blow would be picked up by the sensor).

8. Page 3: By including in the text that "pinnipeds will haul out" it appears that 1) animals will haul out and 2) nothing has been done to the design of the structure prior to putting it in the water to deter the animals. However, in the table it seems that design modifications will be considered. NMFS suggests working with NMFS experts on design ideas for deterring marine mammals.

9. Page 3: Text includes that monitoring will occur at least 1 year prior and 1 year post installation for a 5 year period. If longer than 5 years, how will this change (without consideration of monitoring requirements under MMPA permit)?

10. Page 4: Please describe placement of autonomous recorders. Please address if method of installation would likely interfere with biological resources and/or fishing practices. Please describe where recorders will be placed in project area.

11. Page 4: Please address if noise is anticipated from cables or from water flow across cables underwater, and whether and how this will be monitored.

12. Please include using autonomous recorders to detect ambient noise and changes in noise levels pre- and post-installation, including boat traffic noise through the area.

13. Page 5.2.1.2: Boat-based acoustic monitoring. Please describe if it will occur as needed in conjunction with surveys for marine mammals or with other boat-based work. Section 2.2-1 indicates that in addition to gray whale surveys, monthly boat surveys would occur. NMFS does not consider this frequency sufficient to establish a baseline or monitor a change. NMFS recommends daily boat surveys (unless boat surveys are to be used in conjunction with other daily surveys) to detect use of project area by gray whales, during the gray whale migration and to establish a trend for the project area.

14. Page 5.2.2.1: Please provide detailed description of how boat surveys will be conducted. Please describe the line-transect survey protocol. NMFS recommends having at least one stationary vessel or survey point and recording the animals passing that point and using the line-transect survey in conjunction with the boat or platform/stationary point.

15. Page 5-6: Please define the term "near" as used in "Resident gray and humpback whales observed near project area will be approached and photographed to document use of project area by individual whales and to document the incidence of entanglement scars." NMFS recommends a scientific research permit for this. Please provide explanation of why photo identification of scars is needed, how scar information will be used, and whether this will include documenting potential entanglement caused by project.

16. Please describe the purpose of video recordings of entanglement. Based on the information in the plan, it appears that these video recordings will not be reviewed in near real-time. Therefore, if an animal is entangled and recorded by video, a disentanglement effort may be too late to rescue the animal. If it is anticipated that a marine mammal may become entangled and become injured or die, a Letter of Authorization, rather than an Incidental Harassment Authorization, is appropriate under the MMPA. Video recordings may be able to capture hauled-out, entangled pinnipeds. The monitoring plan should describe protocol for review and response for such a situation.

17. Page 6: NMFS suggests the Entanglement section include: An assessment of the amount of lost gear in the area, and if it differs throughout the year; an analysis of currents in relation to the WEC system; the likelihood of interaction between gear and WEC system; species likely to encounter WEC system underwater; evidence of those species interacting with other gear in the water for other activities. NMFS suggests this information be used to model the risk of interaction prior to placing the WEC in the water to determine frequency and duration of

monitoring. This model should be tested once WECs are in place to determine if monitoring is sufficient or should be modified.

18. Page 6: Please address if there is likely prey within the project area that could lead to the conclusion that baleen whales would be feeding in the area, and thus, subject to interacting with the WEC system while feeding. Please address if mooring lines will be slack or taught. Slack will increase the likelihood entanglement could occur.

19. Please describe how the monitoring techniques will detect an increase in entanglement risk.

20. Please describe if entanglement in the WEC system or entanglement in derelict gear is a greater concern. It is not clear how monitoring methods will assess this.

21. NMFS recommends modifications to the monitoring program description as follows: 1) Are marine mammals using the project area; 2) Is there something about the marine mammal behavior or the system that puts marine mammals at risk of entanglement; 3) Is lost fishing gear…

22. Page 6: Based on the information in the last paragraph of page 6, it appears that it is assumed that if a marine mammal is present in the project area, in this case 200 meters around the WEC array, then they are at risk of entanglement. This assumption should be described.

23. Page 7 or 8 Issue 1 flowchart: NMFS recommends changing box 1 to say "Monitoring Question 1. Are marine mammals using the project area? [Remove putting them at risk for entanglement], but with note, if assumption above is true, that presence=entanglement risk.

24. Page 9: Please describe if other fishing gear types is expected. If so, please describe if it is assumed that that lost gear is shorter than the 200 m crab pots. If they are longer, than this 200 meters may not be sufficient.

25. Page 9: Under the current plan, if marine mammals are not seen pre and post- installation (total of 2 years monitoring), monitoring will be discontinued. Please describe the criteria for making this decision, and contingency if marine mammals do interact with the WEC system after monitoring is discontinued. Please address possible take implications under the ESA and/or MMPA. Please address if there will be periodic monitoring to continue to evaluate conditions. Please conditions that would trigger monitoring to resume? Please note that if a permit is issued under the MMPA, monitoring is associated with this permit and would continue.

26. Page 9: Regarding monitoring questions 2 and 3: Mortality is possible if monitoring is restricted to only several times throughout a given year to detect and remove accumulated lost gear. Please address disposition of lost gear once removed. Please address how it is anticipated that gear will be caught in the WECs and if there anything that can be done before putting WECs in the water to decrease the risk of entanglement.

27. Page 9: NMFS recommends determining monitoring triggers before finalizing the monitoring plan. NMFS recommends holding a meeting with experts to determine these triggers specific to the species.

28. Page 9: NMFS suggests that deterring marine mammals (because of risk of entanglement) should be investigated thoroughly as methods could inadvertently impact non-target species. In addition, deterring marine mammals may or may not mitigate for the increased risk of entanglement due to lost gear. Determining an effective method to reduce lost gear interacting with the WEC system should also be investigated.

29. Page 9: Please describe how mortality and injury data collected from the listed sources will be used. Specifically, whether it is to detect marine mammal mortality or injury from entanglement from this project and, if so, what method will be used to determine the origin of the mortality/injury? Please explain if this data is only to be collected for those animals confirmed at the WEC system.

30. Page 9: NMFS suggests one survey/week during peak gray whale migrations is not sufficient, unless in conjunction with other frequent surveys.

31. Page 9: During non-peak gray whale migration periods, NMFS suggests monthly marine mammal surveys are not sufficient to determine marine mammal abundance in the project area.

32. Page 10: Please describe proposed gear removal methodology. Please address whether gear removal could be disruptive to marine mammals. If so, please include this should in the project description.

33. Page 10: Acoustic monitoring is limited to detecting those animals that vocalize. Therefore, NMFS suggests this technique should be used in conjunction with other methods of observation, as well.

34. Page 10: Please describe how the frequency of gear entanglement is going to be measured and reported.

35. Page 10: NMFS recommends that if any animal is detected, the condition of the animal should be recorded, as well.

36. Page 10: Please explain how data from COASST and the Marine Mammal Stranding Network will be assessed within the project area, pre- and post-installation.

37. Page 10: Please reconcile the position that if exposure of a species to the WEC does not necessarily increase entanglement risk, why, as stated on page 6, “Any marine mammal species detected or observed within 200 meters of the WEC array will be considered in the project area” and at risk for entanglement.

38. Page 11: NMFS suggests the following changes to the structure of the text: 1) Are marine mammals using the project area; 2) Are marine mammals at risk for noise effects?; 3) Is WEC noise at a level that could cause auditory injury to marine mammals?; 4) Is WEC noise causing behavioral disturbances (including masking) to marine mammal species in the project area?

39. Page 11: Please explain if autonomous recorders will be operating continuously. If not, please provide the frequency and duration, and whether and how they will be moored, and if there will be an array.

40. Page 11: NMFS recommends pre- and post- installation surveys for ambient noise.

41. Page 11: Please include the 120 dB threshold for continuous noise. The thresholds are correct for impulse noises. NMFS still uses the 190, 180, 160, and 120 dB thresholds, not those described in the Southall *et al.* 2007 paper. NMFS recommends removing the Southall *et al.* 2007 thresholds, as NMFS does not use these values at this time. NMFS recommends that the plan includes that NMFS is in the process of developing new criteria.

42. Page 11: Please explain if "Zone of influence" includes cumulative versus single sources of noise.

43. Page 11: "If noise from WEC regularly exceeds threshold noise levels for injury to hearing," this may influence the permit under the MMPA.

44. Page 11: The noise criteria are not in the MMPA.

45. Page 11: Noise levels should characterize installation, operation, and decommissioning, as well.

46. Page 11: Please clarify what is meant by "Attempts" will be made to characterize sounds from the WECs below Level A amplitudes. Will only noises above Level A be characterized? If so, why will noise levels below Level A levels not be characterized?

47. Page 11: Please clarify what will be accomplished by comparing noise characteristics with the species' hearing sensitivities and vocal repertoires.

48. General Comment: Issues 1 and 3 refer to 200 nm as "in the project area," and it is not clear what "in the project area" may be for Issue 2 or how it may/may not influence the 200 m zone.

49. Issue 2 flowchart: Monitoring question 1: Please clarify if it is the assumption that if animals use the area then they are at risk?

50. Issue 2 flowchart: NMFS recommends Monitoring Question 2 box reads "Does WEC device injure marine mammal hearing?"

51. Issue 2 flowchart: NMFS recommends including language regarding altering ambient noise levels and what impact that may have on normal behavior/hearing, etc.

52. Issue 2 flowchart: NMFS recommends adding to "significantly affect" (*i.e.*, below threshold levels).

53. Page 15: Please describe how the monitoring schedule and frequency under 3.2.2, specifically for acoustic monitoring of marine mammal vocalizations and monitoring of gray whales via boat surveys, monitors for potential noise impacts?

54. Page 16: If the proportion of gray whale migration that passes through HWCP and its immediate vicinity will be calculated from data collected during gray whale boat surveys, the proposed monitoring schedule does not appear to be sufficient, as described. NMFS recommends more frequent surveys and/or in conjunction with daily surveys (not necessarily boat-based).

55. Page 16: Please include whether sound produced by WECs could influence a marine mammal's ability of detection (*i.e.*, masking). If so, please describe what component(s) of the monitoring plan determine this.

56. Page 16: As acknowledged under 3.2.4, several years of data may be necessary. NMFS, therefore, recommends exploring other monitoring to supplement boat surveys for marine mammal abundance surveys, etc.

57. Page 16: NMFS suggests large whales (*i.e.*, baleen whales) would not be of concern for Issue 3. NMFS suggests narrowing statement to those marine mammals groups that may be of concern in issue 3, not just a general statement of "marine mammals."

58. Page 17: The weight of pinnipeds hauled out on devices could also damage devices or monitoring equipment. NMFS recommends working with experts, including NMFS, to modify designs for deterrence, before putting systems in the water.

59. Page 17: NMFS recommends changing to the following 1) …using project area more after WEC installation than before and if so, why?

60. Page 17: Please describe how the use of gray whale boat surveys will provide information regarding haul out behavior and how recorders would assess non-vocalizing species and determine an increase in foraging or haul out behavior.

61. Page 17: NMFS suggests the 200 nm "in the project area" does not apply to hauling out.

62. Page 17: The number of pinnipeds hauled out may change throughout the day. The one week observation frequency of proposed gray whale surveys would not capture this. Please describe methods to detect this behavior. For example, damage to the structure caused by pinnipeds would provide evidence of their presence, but not frequency or duration.

63. Page 17: If motion-activated cameras are to be used, NMFS recommends consideration of a motion-activated sprinkler system to deter animals from hauling out. NMFS is available to assist with non-lethal deterrence measures.

64. Page 17: Please describe if there will there be any study to determine if an increase in both listed fish and marine mammals causes an increase in consumption of listed fish? Please consider an underwater camera to see if pinnipeds are eating the listed fish as well as scat analysis.

65. Page 18: 3.3.2-3.3.3: Please clarify how the monitoring schedule and frequency will analyze Issue 3 (*i.e.*, gray whales don't eat fish and do not haul out).

66. Page 18: NMFS recommends including recordings of age class, if possible (rather than just pups).

67. Page 18: Please clarify how frequency of visits will be determined, including if individuals will be identified or if the measurement will be confined to frequency of hauling out.

68. Page 19-20 Issue 3 flowchart: NMFS recommends including that monitoring will assess effectiveness of the non-lethal deterrence installed on the WEC system, and, if the modifications are not effective, the cycle repeats.

69. Page 19-20: Please explain the assumption that if pinnipeds are hauling out, then they must be consuming prey.

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Pacific Gas & Electric	)	Project No. 12779-0005
Humboldt WaveConnect Pilot Project Application	)	

CERTIFICATE OF SERVICE

I hereby certify that I have this day served, by first class mail or electronic mail, a letter to Secretary Bose, Federal Energy Regulatory Commission, containing NOAA's National Marine Fisheries Service's Comments regarding the Pacific Gas and Electric Company's Draft Pilot License Application for the Humboldt WaveConnect Project, and this Certificate of Service upon each person designated on the official service list compiled by the Commission in the above-captioned proceeding.

Dated April 30, 2010

David White

_____

David K. White
National Marine Fisheries Service