4.4. POTENTIAL IMPACTS OF OCEAN ENERGY PROJECTS ON MIGRATION AND HABITAT USE OF GREEN STURGEON (*ACIPENSER MEDIROSTRIS*)

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Construction of a wave energy facility is planned for a site off of Reedsport, Oregon. The initial licensed development will consist of ten buoys within a 0.25 mile^2 area at depths of 50 - 69 m and will produce up to 1.5 megawatts (MW; Figure 7)[a]. A proposed project expansion (not currently licensed) could include 100 buoys that may occupy an area of approximately 1 mile x 5 miles and produce 50 MW (Figure 7)[b].

Green sturgeon, currently listed as threatened under the U.S. Endangered Species Act (ESA), commonly migrate in oceanic waters along the U.S. West Coast at depths of 40 – 70 m during winter and spring months, which places the wave energy project directly within this species' migratory corridor (Figure 7). Furthermore, given the proximity to the Umpqua River estuary (designated critical habitat), it is possible that the site selected for this wave energy project may be a concentration area for certain green sturgeon activities, such as feeding. An acoustic telemetry study has recently been funded to determine whether, and how, the proposed wave energy development may affect green sturgeon behavior and migration patterns. Outcomes of the study will include a determination of the potential cumulative impacts of the numerous ocean-energy projects planned for development along the U.S. West Coast. The study will have a Before-After design, with the Phase I "Before" [wave energy buoys] component planned for early 2013 to late spring 2014, encompassing three oceanic migration periods. Phase I will gather baseline information on sex- and age-specific spatial and temporal patterns of habitat use. To these ends, we will deploy three parallel lines of acoustic telemetry receivers, oriented onshore/offshore, with the central line bisecting the wave energy development (Figure 7). The receivers, spaced closely enough in each line to yield a detection rate near 100%, will measure metrics including depth of detection, speed, and minimum transit distance through the array. Phase II, the "After" component of the study, will mirror the design of the "Before" component. Phase II results will be compared with Phase I results in order to determine if the fully operational wave energy installation affects patterns of habitat use. Phase II is unfunded at this time, but funding will be sought once the wave energy installation is more definite and is close to fully operational.

In addition to their relevance for green sturgeon along the U.S. West Coast, results of this study may also be used to evaluate the potential impacts of planned ocean energy projects on threatened or endangered sturgeons in the Atlantic ocean (e.g., Atlantic sturgeon) and in the Gulf of Mexico (e.g., Gulf sturgeon). Furthermore, this study will be useful for identifying potential impacts of this wave energy park to other acoustically-tagged species (e.g., white shark, which is currently under consideration for ESA listing).

Funding for this study will be provided by the Oregon Wave Energy Trust (OWET), NOAA, Southwest Fisheries Science Center, and the Northwest National Marine Renewable Energy Center (NNMREC).

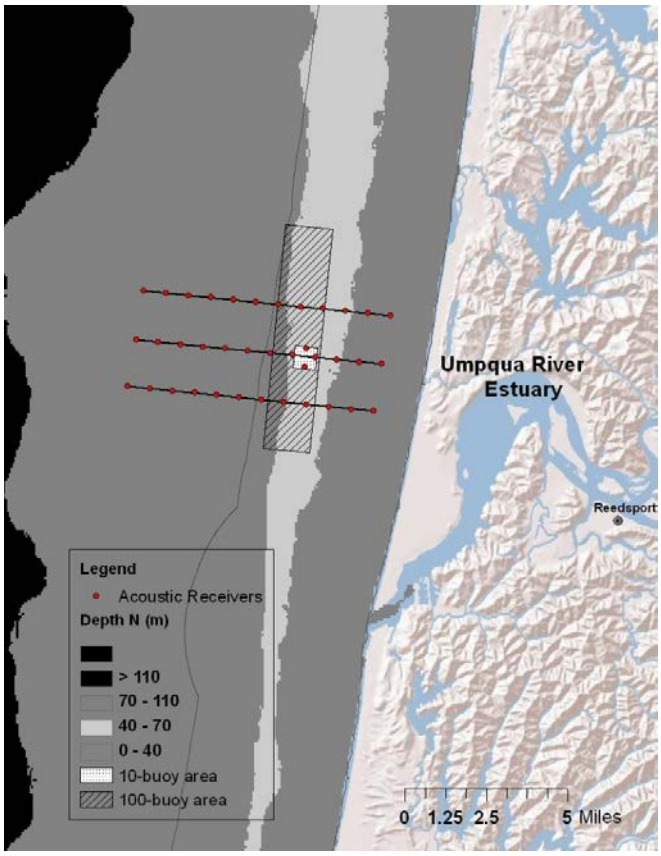

Figure 7: Location of the proposed OPT wave energy developments off of Reedsport, OR near the Umpqua River Estuary (small-dotted box = licensed project, 10 buoy array; large-hashed box = proposed expanded project, 100 buoy array). Green sturgeon critical habitat (to 110 m) is dark gray. Depths most frequently inhabited by green sturgeon during oceanic migration (40 to 70 m) are light gray (= migratory corridor). Black represents depths greater than 110 m (i.e., seaward of green sturgeon critical habitat). The study design, including proposed locations for three lines of receivers extending through the OPT Wave Energy projects, is also shown.

OCS Study
BOEM 2013-0113

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FINAL REPORT

APRIL 2013

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Prepared under BOEM Cooperative Agreement No. M12ACOOOI2
by
Oregon State University
Hatfield Marine Science Center
Newport, OR 97365

Published by

U.S. Department of the Interior
Bureau of Ocean Energy Management
Pacific Region

Cooperative Agreement
Hatfield Marine Science Center
Oregon State University

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This report had been reviewed by the Pacific Outer Continental Shelf Region, Bureau of Ocean Energy Management, U.S. Department of Interior and approved for publication. The opinions, findings, conclusions, or recommendations in this report are those of the authors, and do not necessarily reflect the views and policies of the Bureau of Ocean Energy Management. Mention of trade names or commercial products does not constitute an endorsement or recommendation for use. This report has not been edited for conformity with Bureau of Ocean Energy Management editorial standards.

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CITATION

Suggested citation:

Boehlert, G., C. Braby, A. S. Bull, M. E. Helix, S. Henkel, P. Klarin, and D. Schroeder, eds. 2013. Oregon Marine Renewable Energy Environmental Science Conference Proceedings. U.S. Department of the Interior, Bureau of Ocean Energy Management, Cooperative Agreement with Oregon State University M12AC00012. OCS Report BOEM 2013-0113. 134 pp.

COVER ART ACKNOWLEDGEMENT

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