Environmental Studies Program: Ongoing Study

Title	Net Environmental Benefit Analysis of Pacific Platform Decommissioning Scenarios (NSL #PC-16-x07)
Administered by	Pacific OCS Region
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Procurement Instrument(s)	Cooperative Agreement
Conducting Organizations(s)	University of California, Santa Barbara
Total BOEM Cost	$455,000
Performance Period	FY 2016–2020
Final Report Due	September 30, 2020 (report expected February 2021)
Date Revised	January 22, 2021
PICOC Summary	
Problem	Decision-makers need information regarding the potential ecological fate of spent petroleum platforms offshore California.
Intervention	Using previously collected data, a Net Environmental Benefit Analysis approach will be used to determine the potential impact of various decommissioning options.
Comparison	A Net Environmental Benefit Analysis will be conducted for the following options: leave in place, partial removal, and complete removal.
Outcome	The Analysis will help inform decision-makers and the public about the environmental outcomes of possible decommissioning options.
Context	Southern California

BOEM Information Need(s): The fate of spent petroleum platforms offshore California has been a subject of considerable debate, much of which is focused on the potential importance of the ecosystems at these facilities. California Assembly Bill (AB) 2503 authorizes the State to consider allowing platform owners to leave offshore platforms at least partially in place as artificial reefs. In considering this, the California Ocean Protection Council must determine whether partial removal of the structure would provide a net environmental benefit (NEB) to the marine environment compared to full removal of the structure. Currently, synthesis and modeling of scientific information to make this determination either holistically or on a platform-by-platform basis is lacking. The results of this study will help to define NEB through consideration of possible positive and negative consequences for platform removal scenarios allowed under both federal and state law. Results will be used in NEPA documents for decommissioning and to fulfill consultation and analysis requirements under the Magnuson-Stevens Fisheries Conservation and Management Act, Endangered Species Act, and Marine Mammal Protection Act.

Background: Regulation of federal oil and gas leases requires complete removal of drilling rigs and associated infrastructure upon decommissioning (30 CFR 250. 1700-1754). There may be substantial environmental impact from removal, particularly given the depth of water and the size of the structures offshore California. Vibrant fish and invertebrate communities inhabit the structures and previous

research indicates that these communities can be highly productive biologically, sometimes contributing significant proportions of the populations of certain fish species, for example (Claisse et al. 2014). These considerations have led to discussions regarding alternatives to complete removal, in particular partial removal and conversion to artificial reefs. The State of California formalized this possibility in 2010 with AB 2503, and subsequently the California Ocean Protection Council (OPC) funded a report by the nonprofit California Ocean Science Trust (OST) that studied some of the benefits and costs of partial removal as part of an effort to inform the State on this issue. The report concluded, based on studies showing enhanced productivity of certain marine species near oil platforms, that partial removal could provide significant benefits to marine life (Bernstein et al. 2010). The study did not evaluate thoroughly all the costs and benefits of partial removal or the ecological benefits or harms from partial removal of any particular platform.

Stipulated in AB 2503 are a list of more specific factors that OPC will need to consider when making the determination of net environmental benefit: (1) The contribution of the proposed structure to protection and productivity of fish and other marine life; (2) Any adverse impacts to biological resources or water quality, or any other marine environmental impacts, from the full removal of the facility that would be avoided by partial removal; (3) Any adverse impacts to biological resources or water quality, or any other marine environmental impacts, from partial removal of the structure; (4) Any benefits to the marine environment that would result from the full removal of the structure or from partial removal; and (5) Any identified management requirements and restrictions of the partially removed structure, including, but not limited to, restrictions on fishing or other activities at the site.

Thus, in order to reach conclusions about the environmental consequences of decommissioning platforms, information is needed on the community structure and productivity of the platforms compared with the surrounding soft bottom habitat, and the changes to both of these habitats that would result from alternative decommissioning options. In addition, holistic impacts of the removal process would need to be considered along with longer-term impacts and benefits of alternative scenarios biologically and environmentally. This study focuses on comparing the biological communities and their productivity between different decommissioning options.

Objectives:

1. Estimate the productivity of fish and invertebrate communities and key fish species on offshore California platforms under different decommissioning scenarios and on an individual platform basis, wherever possible.
2. Compare platform productivity and community structure with undisturbed pristine habitat that is replaced by the platform (soft and hard bottom near platforms).
3. Explore how these differences might change over time as decommissioning options alter the conditions for associated biological communities.
4. Model and predict positive and/or negative benefits to the marine environment that could result from partial removal versus full removal of the structure.
5. Provide confidence level interpretation of model results.
6. Synthesize the data, model, and results in a report that defines and determines net environmental benefit of Pacific platform decommissioning scenarios.
7. Publish in peer-reviewed journals.

Methods:

1. Use over 20 years of fish and invertebrate community survey data from past research to evaluate depth-stratified community structure and productivity for California offshore platforms.
2. Use soft/sand bottom survey data from the Southern California Coastal Water Research Project and other sources to estimate soft-bottom habitat community structure and productivity for depths equivalent to platform siting locations in the southern California Bight.
3. Use available data to estimate how different decommissioning options will alter food webs and associated biological communities on platforms and surrounding natural habitat.

Current Status: The BOEM-UCSB cooperative agreement, which is jointly funded by BOEM and BSEE, was awarded September 20, 2016. Completed efforts include, for platform habitats, acquiring and cleaning two datasets of fish species composition, abundance, and length observed adjacent to platform structure for the comparison of fish biomass and secondary production on each of 23 oil and gas platforms in federal waters. Transect depths and lengths were checked and corrected as necessary. Fish species were assigned as pelagic or platform associated. For natural habitats, two additional data sets were acquired regarding fish species composition, abundance, and length from bottom trawl surveys of soft bottom habitat in the Southern California bight. Models have been developed to convert fish data into estimated biomass and secondary production estimates. Platform surveys were analyzed to obtain site-specific structural geometries. The final report is in preparation and is expected in February 2021.

Publications Completed:

Claisse JT, Love MS, Meyer-Gutbrod EL, Williams CM, Pondella DJ II. 2019. Fishes with high reproductive output potential on California offshore oil and gas platforms. Bulletin of Marine Science 95(4):515-34.

Meyer-Gutbrod EL, Kui L, Nishimoto MM, Love MS, Schroeder DM, Miller RJ. 2019. Fish densities associated with structural elements of oil and gas platforms in southern California. Bulletin of Marine Science 95(4):639-656.

Meyer-Gutbrod EL, Love MS, Claisse JT, Page HM, Schroeder DM, Miller RJ. 2019. Decommissioning impacts on biotic assemblages associated with shell mounds beneath southern California offshore oil and gas platforms. Bulletin of Marine Science 95(4):683-702.

Meyer-Gutbrod EL, Love M, Miller R, Claisse J, Schroeder DM. 2018. Forecasting fish community biomass and production on offshore Pacific oil platforms under three decommissioning scenarios. GeoHab 2018: Marine Geological and Biological Habitat Mapping Annual Conference, Santa Barbara, CA.

Meyer-Gutbrod E, Love MS, Schroeder DM, Claisse JT, Kui L, Miller RJ. *In press*. Forecasting the ecological legacy of aging offshore oil and gas platforms by modeling fish community change under decommissioning. Ecological Applications.

Affiliated WWW Sites:

https://marinecadastre.gov/espis/#/search/study/100173

UCSB Press release:
http://www.news.ucsb.edu/2017/018182/decommissioning-platform-holly

References:

Bernstein B, Bressler A, Cantle P, Henrion M, John D, Kruse S, Pondella D, Scholz A, Setnicka T, Swamy S. 2010. Evaluating alternatives for decommissioning California's offshore oil and gas platforms. California Ocean Science Trust, Oakland, CA. http://www.oceansciencetrust.org/wp-content/uploads/2015/04/oil-and-gas-decommissioning.pdf

Claisse JT, Pondella DJ, Love M, Zahn LA, Williams CM, Williams JP, Bull AS. 2014. Oil platforms off California are among the most productive marine fish habitats globally. Proceedings of the National Academy of Sciences. 111(43):15462–7. doi: 10.1073/pnas.1411477111. http://www.pnas.org/content/111/43/15462.full.pdf.