

## **BOEMRE ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES**

**Region:** Pacific OCS Region

**Planning Area:** Southern California

**Title:** Regional Importance of Manmade Structures as Rockfish Nurseries (PC-10-01)

**Total Cost:** \$475,000

**Period of Performance:** FY 2010 – 2013

**Conducting Organization:** USGS

**BOEMRE Contact:** Donna Schroeder

**Description:** Background: To obtain an ecosystem-level understanding of the OCS, biological and physical databases must be integrated. With the completion of recent and ongoing BOEMRE region-wide oceanographic and geologic surveys, it is time to link and expand biological surveys to match the spatial scale of these physical databases. Such integration will be important to all aspects of permitting, mitigation and decommissioning decisions concerning the OCS.

For example, future Pacific OCS decommissioning decisions will rely in part on the relative importance of shallow water platform habitat as nurseries to commercially-important rockfish species as compared to natural reefs within the region. The majority of marine species at oil platforms and natural reefs do not reside in these habitats for their entire life. Population connectivity within and among habitats varies according to the life history of each species, oceanographic patterns, and distribution of hard bottom habitats. One consequence of a spatially complex life history is that impacts of a reefed platform may propagate across regions and habitats and affect other populations. Therefore, understanding and integration of physical and biological connectivity processes must precede predictions regarding the environmental consequences of platform decommissioning alternatives. We now have sufficient knowledge to address these large scale questions. BOEMRE information needs thus include establishing how the addition or removal of such habitat will impact regional environments. Additionally, the knowledge gained from this study will allow BOEMRE to address critical concerns raised in the University of California Blue Ribbon Science Panel on Decommissioning about the contribution of oil and gas platforms to regional fish stocks.

This study is one of a series of platform nursery habitat studies in the POCS. The proposed study represents a critical next step in a coordinated program that extrapolates local scale studies across the entire region of interest to OCS activities. BOEMRE-funded studies that will be integrated in this program include those describing oceanographic patterns in the Santa Barbara Channel region as well as the seafloor habitat mapping studies. Previously, BOEMRE funded two local-scale studies on the nursery function of offshore platforms. The first study, *Assessing the Fate of Juvenile Rockfish at Offshore Platforms and Natural Reefs in the Santa Barbara Channel* NSL PC-04-02, performed a longitudinal study on the fate of juvenile rockfish if platforms were not present. During FYs 2008-2011, BOEMRE is supporting the study *Spatial and Seasonal Variation in the Biomass and Size Distribution of Juvenile Fishes Associated with a Petroleum Platform off the California Coast*, which is collecting fine-scale data on the abundance and species composition of juvenile fishes recruiting to OCS facilities.

Objectives: The overall objective of this study is to perform an ecosystem-level synthesis of the POCS using region-wide oceanographic, geologic and biologic data. The initial efforts in applying this synthesis will focus on understanding the regional importance of platform habitat as rockfish nurseries in order to predict consequences of future leasing, production or decommissioning activities to EFH and managed fish species.

Methods: 1) The contractor will update a BOEMRE - USGS geographical information system (GIS) with new seafloor habitat, temperature, and bathymetry information; 2) Using information in the scientific literature on abundance distribution of life history stages (juvenile and adult) in relation to physical parameters, a series of “potential habitat” layers will be generated for each species of interest and incorporated into the GIS; 3) Field surveys will be conducted to assess the absolute biomass/stock of juvenile rockfishes that inhabit shallow water habitats (both natural reefs and platforms) within the Santa Barbara Channel region. The scuba survey will, for the first time on the Pacific coast, use a randomized, stratified, and geo-referenced survey design that allows for statistical inference across large scales; 4) the GIS will use region-wide patterns of surface currents and potential habitat layers for two overfished species, lingcod and Boccaccio, that have pelagic larvae which reside in the upper water column, and generate “connectivity envelopes” across areas of interest (Santa Barbara Channel region and San Pedro Basin) that outline likely pathways of larval transport, and potential juvenile-adult migration patterns. Connectivity envelopes for adult-pelagic larvae stages are constructed using larval duration periods combined with seasonal current vectors and overlaid onto potential habitat layers. Possible juvenile-adult migration patterns will be identified by potential habitat layers of each stage and distance to nearest habitat patches. In both types of analyses, platform-natural reef links will be featured.

Importance to BOEMRE: The BOEMRE will need to make decisions in future years about the fate of decommissioned platforms offshore Southern California. In order to make knowledgeable evaluations and prepare NEPA documents, an understanding of the ecological consequences of different decommissioning options (e.g. complete removal or a reefing option) must be obtained. To this end, this study proposes to assess the relative importance of shallow water platform habitat as nurseries to commercially-important rockfish species by integrating large-scale physical and biological databases. The knowledge gained from this study will allow BOEMRE to address critical concerns raised in the University of California Blue Ribbon Science Panel on Decommissioning about the contribution of oil and gas platforms to regional marine populations. Since this study is region-wide, the cumulative effects of multiple decommissioning events on fish stocks can also be ascertained from this effort.

**Current Status:** Awarded July 1, 2010 and ongoing.

**Final Report Due:** June 30, 2013

**Publications:** None

**Affiliated WWW Sites:** None

**Revised Date:** December, 2010