

## **BOEM ENVIRONMENTAL STUDIES PROGRAM: Ongoing Study**

**Region:** Pacific

**Planning Area(s):** Southern California

**Title:** Analysis of Fish Populations at Platforms off Summerland California (PC-12-07)

**BOEM Information Need(s) to be Addressed:** BOEM regulates oil and gas activities on platforms off the southern California coast. The issue of platform decommissioning and decisions related to decommissioning and possible reefing will be decided on a platform by platform basis with each of the platforms judged on its own merits as far as ecological value is concerned. There are eight platforms, very closely grouped, within the Dos Cuadras oil field, off Summerland, California. Survey of fish at these eight platforms will provide foundational information of regional populations so that BOEM can specify requirements to industry or other interested parties when decommissioning occurs. Additionally, this study will provide a more accurate picture of the ecological importance of this group of platforms than is currently available.

**Total BOEM Cost:** \$625,000      **Period of Performance:** FY 2012-2015

**Conducting Organization:** University of California, Santa Barbara and Occidental College

**Principal Investigator:** Dr. Milton Love

**BOEM Contact:** [Dr. Ann Scarborough Bull](#)

### **Description:**

**Background:** There are 23 platforms in federal waters off southern California. The majority of these platforms have been surveyed multiple times using a manned submersible with a many platforms surveyed annually during the past 14 years of research. However, there are eight platforms in federal waters of the Santa Barbara Channel that have been only incompletely surveyed. The eight platforms off Summerland, California, Platforms C, B, A, Hillhouse, Henry, Houchin, Hogan, and Habitat have been in operation for over four decades and are expected to be some of the first to be in line for decommissioning. Problematically, these structures (located in 47 to 88 m of water) are situated in a depositional, and hence turbid-water, region. In practice, this has meant that, despite a number of attempts over 14 years, water visibility at the bottom of the platform jackets and over the adjacent shell mounds has been too poor to safely allow assessment of fish assemblages using a manned submersible. However, a recent review of segments of a ROV video of one of these platforms, indicates that fish populations at these platform habitats could be adequately surveyed using a combination of SCUBA and a remotely operated vehicle (ROV). The SCUBA and ROV surveys would be run using the same transect protocols of previous manned submersible surveys and thus would produce data that would be compatible and comparable with the manned submersible data.

Among previous findings, using the manned submersible, it is clear that there are three distinct fish assemblages around Pacific platforms: water column, bottom, and shell mound. The water columns within many platforms serve as important fish nursery grounds. Juvenile densities of a number of species around many platforms are greater than those on most natural reefs in southern California. The bottoms around platforms are often the habitat of adult rockfishes and other species, or of older juvenile fishes, densities of which may be larger than at many natural sites. The shell mounds harbor both juveniles and the adult stages of dwarf species. In addition, as with natural reefs, platforms both produce and aggregate fishes and may be regionally important in enhancing the fish populations of some economically important species.

Objectives: The goal of this research is to conduct fish assemblage surveys at and analyze resulting data from eight platforms off Summerland, California (Platforms C, B, A, Hillhouse, Henry, Houchin, Hogan, and Habitat). The primary objectives of this study are to: (1) use the same transect pattern and protocols with SCUBA and ROV that has been used in previous manned submersible work; (2) characterize the fish assemblages around eight platforms; (3) describe the spatial and temporal patterns of fish diversity, density and size distribution among platform habitat types (shell mound, platform bottom, water column; and (4) complete analyses and synthesis documents for the eight platforms themselves and within the context of the manned submersible data from other Pacific platforms.

Methods:

- This is a three-year project with the first two years dedicated to surveys and the final third year dedicated to analysis and report writing.
- Surveys will be performed using SCUBA for water column down to a depth of approximately 30 m and an ROV for the remainder of the water column, bottom, and shell mounds of eight platforms located off Summerland, California (Platforms C, B, A, Hillhouse, Henry, Houchin, Hogan, and Habitat).
- In each of the first two years, the upper portions of the platform (to a depth of about 30 m) will be surveyed with SCUBA, utilizing techniques identical to those used over the past 14 years at other California platforms. Beginning in June, SCUBA surveys will be conducted at each platform in each month for four months. As with the manned submersible work, but in this case using SCUBA, each platform will be circled first at the horizontal structural support closest to 30 m depth and the survey will proceed upward along horizontal structural supports to the sea surface performing belt transects using a high definition video camera.
- In the fall of the first two years, an ROV survey will be conducted to document the fish assemblages around the midwaters and bottom of each platform and on the surrounding shell mound, thus completing a total survey of the shell mounds and platform jackets.
- As with the manned submersible work, but in the case of the ROV, each platform will be circled first on the shell mound away from the jacket and then at the bottom of the jacket and proceed upward along horizontal structural supports to a depth overlapping the depth of 30 m. As the ROV moves forwards, belt transects will be conducted using a high definition video camera that is oriented to look sideways off the starboard side. This is identical to the methodology used in the manned submersible surveys.
- All fish species within belt transects of 2 m off the starboard side of ROV and SCUBA divers will be identified to species and estimates will be made of the lengths of all fishes.

- An analysis and synthesis of the data will be performed to provide a more accurate picture of the ecological importance of this group of platforms than is currently available for the eight platforms themselves and within the context of the manned submersible data from other Pacific platforms.

**Current Status:** The second and final field season was completed in November 2013. Data were analyzed during the early part of 2015. BOEM received the draft report in June 2015 and requested few revisions. Based on very high densities of juveniles, one of the major functions of the Summerland platforms is as a nursery ground for a suite of species, primarily rockfishes but also including lingcod and painted greenling. Adult fishes (e.g., blacksmith, cabezon, garibaldi, and sheephead) are present, sometimes in substantial numbers, but juvenile rockfish dominance relegates these other species to a relatively small fraction of the total fish population. The densities of fishes in the midwaters of most California platforms vary greatly between years, regardless of platform bottom depth, because juvenile rockfish recruitment varies (sometimes dramatically) between years.

**Final Report Due:** September 2015

**Publications Completed:** None

**Affiliated WWW sites:** None

**Revised Date:** July 30, 2015