STUDY TITLE: Using nocturnal surveys to monitor the presence of Ashy Storm-Petrels & Xantus's Murrelets at offshore platforms, southern California.

REPORT TITLE: Nocturnal surveys for Ashy Storm-Petrels (*Oceanodroma homochroa*) and Scripps's Murrelets (*Synthliboramphus scrippsi*) at offshore oil production platforms, southern California.

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PROJECT MANAGER(S): Thomas E. Hamer

AFFILIATION (OF PROJECT MANAGER): Hamer Environmental L.P.

ADDRESS: P.O. Box 2561 Mount Vernon, WA, 98273, USA

PRINCIPAL INVESTIGATOR(S)*: David Pereksta and Thomas Hamer

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BACKGROUND: The attraction of seabirds to bright lights and associated light-induced mortality of seabirds has been well-documented (Imber 1975, Reed et al. 1985, Telfer et al. 1987, Le Corre et al. 2002). The extent of this light-induced threat is unknown, but has been recognized for two special-status California seabird species, the Scripps's Murrelet (*Synthliboramphus scrippsi;* previously Xantus's Murrelet [*S. hypoleucus*]) and Ashy Storm-Petrel (*Oceanodroma homochroa*) (Carter et al. 2000, McCrary et al. 2003, U.S. Fish and Wildlife Service [USFWS] 2012, 2013). Dead Ashy Storm-Petrels have been recovered at Platform Hondo in the Santa Barbara Channel and at coastal locations in southern California with bright lights (Carter et al. 2000). The threat of artificial lighting is considered large for Ashy Storm-Petrels, potentially affecting over 35% of the total breeding population (Harvey 2012, USFWS 2013). Light attraction has been reported for the Scripps's Murrelet at a coastal location in central California (Carter et al. 2000, USFWS 2012). In addition, both species have been observed landing on or colliding with brightly lit boats at night off southern California (D. Pereksta, personal observation). Incidental observations like these are the only existing information regarding the effects of artificial lighting on these two species and no directed studies have been conducted to date. The Scripps's and Guadalupe Murrelet Technical Committee of the Pacific Seabird Group has identified lighting studies as a need to fill information gaps for these species. Lighting studies were also recommended for the Ashy Storm-Petrel in recent summaries of its status and threats (Carter et al. in Shuford and Gardali 2008, USFWS 2013).

Offshore oil operations are conducted from 27 platforms along the southern coast of California and all within the ranges of Scripps's Murrelets and Ashy Storm-Petrels (Briggs et al. 1987, McCrary et al. 2003). Twenty three of these platforms are overseen by BOEM and the remaining four are managed by the State of California. Offshore platform lights are used to illuminate work areas and to make the platforms visible to ocean vessels. In the near future, offshore renewable energy production is likely to be proposed along the Pacific Outer Continental Shelf (POCS) including coastal regions of southern California (USFWS 2009, 2013). Marine radar has been used to detect nocturnal seabirds, including Scripps's Murrelets and Ashy Storm-Petrels, near breeding colonies, and in low-light conditions where detections of the seabirds by other methods is difficult and often impossible (Hamer et al. 1995, 2005). Through previous radar studies off southern California, identification of multiple seabird species was determined based on differentiation by radar flight speeds and echo sizes while monitoring Scripps's Murrelet nesting colonies at night (Hamer et al. 2005). Marine radar was determined as a practicable method to employ to detect seabirds that may be attracted to bright lights on offshore oil platforms in the POCS region of southern California.

OBJECTIVES: The observance and monitoring of two special-status, nocturnal seabird species, Scripps's Murrelet and Ashy Storm-Petrel near operating offshore oil platforms in the Santa Barbara Channel of southern California was the primary purpose of this study. Other specific objectives of this study included: (1) evaluating the extent to which Scripps's Murrelets and Ashy Storm-Petrels interact with bright lights of offshore oil platforms off the coast of southern California and; (2) determine if important rafting and foraging areas exist for these birds near offshore platforms.

DESCRIPTION: Ornithological radar was used during the night to measure light attraction rates of seabirds to the offshore oil platforms. The surveillance radar was operated throughout each night from 45 minutes after dusk to 45 minutes before dawn. In addition, audio/visual observers surveyed for birds attracted to the platform lights for 1.5 hours each night, searched for grounded seabirds twice per night, and collected data on rafting and transiting seabirds in the vicinity of the platforms twice per day. Radar was also used to measure the rate of nocturnal avian migration over the Santa Barbara Channel for 1 night in the spring and fall. Light Attraction radar surveys took place between March and November, with the spring surveys (March and April) focused on Scripps's Murrelets, while the summer and fall surveys (July – November) were focused on Ashy Storm–Petrels. Spring surveys consisted of two 10-night radar and audio-visual survey sessions (20 days total), and were conducted on Platform Grace. Spring survey dates were selected to coincide with known peak breeding activities of adult Scripps's Murrelets. Four 10-night radar/visual surveys (40 days total) for Ashy Storm-Petrels were conducted on platforms Grace and Hermosa in the summer and fall. These survey periods were selected to capture the peak in breeding activities of Ashy Storm-Petrels.

SIGNIFICANT CONCLUSIONS: Light attraction events as measured by radar were low over the three seasons on the majority of the 56 nights where successful sampling occurred. However, 40 of the 60 nights (66.7%) of the study were spent on Platforms Grace, which had very low light emittance levels and thus may have affected study results. The average number of light attraction events recorded per night over the 56 nights was 1.23 events per night with the majority of these targets (69.5%) recorded in the spring during an active nocturnal bird migration. Over the three seasons, light attraction events were recorded on 44.5% of the nights sampled. Light attraction events recorded by radar did not appear to increase with poorer visibility conditions or be related to weather conditions associated with fog, rain, or heavy cloud cover. An active spring and fall nocturnal bird migration occurs over the Santa Barbara Channel. In addition, Peregrine Falcons were found to use the oil platforms to hunt from and appeared to be killing significant numbers of Scripps's Murrelets in the spring. Large differences exist in the level of

light emittance between different oil platforms. Future studies of light attraction should take these differences into account.

STUDY RESULTS: In the spring, the average light attraction rate of avian targets recorded flying toward the platform was 0.13 ± 0.07 targets/hr/km. Avian targets recorded flying toward the platform were detected during 9 of 16 (56%) survey nights. The highest light attraction rate was recorded on 7

April with 0.82 ± 0.26 targets/hr/km. The flight directions, flight speeds, and timing of activity of these targets indicated that a proportion of them were likely migrating birds. No birds were observed attracted to the platform lights during the visual observation periods in spring and no grounded birds were found. Multiple rafts of Scripps's Murrelets were observed in the vicinity of Platform Grace in the spring.

During the summer surveys, the average light attraction rate of avian targets recorded flying toward the platform on surveillance radar was 0.02 ± 0.02 targets/hr/km. Avian radar targets flying toward the platform were recorded during 9 of 20 (45%) survey nights. No birds were detected being attracted to the platform lights and no grounded birds were found. Two Ashy Storm-Petrels were observed transiting off the platform, while a number of unidentified storm-petrels were seen rafting and transiting off the platform.

The average fall light attraction rate of avian targets recorded flying toward the platform on surveillance radar was 0.03 ± 0.02 targets/hr/km. Avian targets flying toward the platform were recorded during 7 of 20 (35%) nights. The highest light attraction rate was recorded on 1 October with 0.20 ± 0.15 targets/hr/km detected.

Visual observations of birds being attracted to lights and findings of grounded birds indicated that three species were observed to be most at risk from collisions with offshore oil platforms. These species included the Cassin's Auklet, Leach's Storm-Petrel and Red-necked Phalarope.

Using night sky satellite imagery, an assessment was conducted to quantitatively compare artificial light emittance levels between oil platforms Grace and Hermosa. Based on integrated density values, Hermosa was 125% brighter than Grace. Heritage, the control, was 166% brighter than Hermosa and 207% brighter than Grace. Platform Hermosa may have had higher rates of light attraction and grounded birds due to higher light emittance levels. Future studies of light attraction should take into account the relative differences in the light emittance levels of different platforms.

STUDY PRODUCT(S): Hamer, T., M. Reed, E. Colclazier, K. Turner and N. Denis. 2014. Nocturnal Surveys for Ashy Storm-Petrels (*Oceanodroma homochroa*) and Scripps's Murrelets (*Synthliboramphus scrippsi*) at Offshore Oil Production Platforms, Southern California. US Dept. of the Interior, Bureau of Ocean Energy Management, Pacific OCS Region, Camarillo, CA. OCS Study BOEM 2014-013. 70 pp.

* P.I.’s affiliation may be different than that listed for Project Manager(s).

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Map showing study area.