Offshore Oil and Gas Development and Production Activities in the Southern California Planning Area

Biological Assessment

Endangered and Threatened Species

U.S. Department of the Interior
Bureau of Ocean Energy Management
Camarillo, CA

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Prepared for the U.S. Fish and Wildlife Service

In Accordance with Section 7(c) of the Endangered Species Act of 1973,

as Amended

July 2025

U.S. Department of the Interior
Bureau of Ocean Energy Management
Camarillo, CA

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List of Abbreviations and Acronyms

AIS Automatic Identification System
APD Application for Permit to Drill
APM Application for Permit to Modify
BA Biological Assessment
Bbbl Billion(s) barrels of oil
Bbl barrel(s) of oil (1 bbl = 42 gal)
BLM Bureau of Land Management
BOEM Bureau of Ocean Energy Management
BOEMRE Bureau of Ocean Energy Management, Regulation and Enforcement
CH Critical Habitat
CSLC California State Lands Commission
CWA Clean Water Act
dB decibel(s)
DOI Department of Interior
DP Dynamically positioned
DPP Development and production plan
EPA Environmental Protection Agency
ESA Endangered Species Act
G&G Geological and Geophysical
GNOME General NOAA Operational Modeling Environment
HESS High Energy Seismic Survey
HF Hydrofluoric acid
HRG High Resolution Geophysical
ICS Incident Command System
IHA Incidental Harassment Authorization
LAA Likely to be adversely affected
LE Exposure Level
LOA Letter of Authorization
MMPA Marine Mammal Protection Act
MMS Minerals Management Service
MODU Mobile offshore drilling units
MSRC Marine Spill Response Corporation
MWCP Marine Wildlife Contingency Plan
NEPA National Environmental Policy Act
nmi nautical mile(s)
NLAA Not likely to be adversely affected
NMFS National Marine Fisheries Service
NOAA National Oceanic & Atmospheric Administration
NPDES National Pollutant Discharge Elimination System

NWR National Wildlife Refuge
O&G Oil and Gas
OCS Outer Continental Shelf
ONRR Office of Natural Resource Revenues
OPR Office of Protected Resource
OSPR Office of Spill Prevention and Response
OSRO Oil spill removal organization
OSRP Oil Spill Response Plan
PAH Polycyclic aromatic hydrocarbons
PBF Physical or biological features
PK Peak sound level
POCSR Pacific Outer Continental Shelf Region
PSO Protected species observer
PTS Permanent threshold shift
RU Recovery unit
ROMS Regional Ocean Modeling System
ROV Remotely operated vehicle
RMS root mean square
SCPA Southern California Planning Area
SEL Sound exposure level
SPL Sound Pressure Level
SVRA State Vehicular Recreation Area
TAP Trajectory Analysis Planner
TTS Temporary threshold shift
UC Unified Command
USCG U.S. Coast Guard
USFWS U.S. Fish and Wildlife Service
USGS U.S. Geological Survey

U.S. Department of the Interior
Bureau of Ocean Energy Management
Camarillo, CA

BOEM
BUREAU OF OCEAN ENERGY MANAGEMENT

1 Purpose and Background

1.1 Purpose

This programmatic Biological Assessment (BA) describes current and expected activities associated with development and production of oil and gas (O&G) reserves within the Southern California Planning Area (SCPA; Figure 1) of the Pacific Outer Continental Shelf Region (POCSR) and requests Endangered Species Act (ESA), of 1973, as amended (16 U.S.C. 1531 et seq.), section 7 consultation. Specifically, this BA requests consultation for activities authorized, funded, or carried out by the Bureau of Ocean Energy Management (BOEM) and/or Bureau of Safety and Environmental Enforcement (BSEE).

This BA represents our latest comprehensive review of present and future offshore O&G activities in the SCPA and includes our assessment of potential effects on endangered and threatened species and their designated critical habitat (CH) under the U.S. Fish and Wildlife Service (USFWS) jurisdiction.

This assessment is intended to supplement and combine earlier assessments and endangered species consultations for routine O&G development activities currently underway or reasonably certain to occur in the SCPA. This BA also provides background information on activities that BOEM and BSEE do not consider part of the proposed actions and therefore exclude from consultation, in addition to those for which consultation is requested (Table 1). In describing specific activities, this BA may refer to either BOEM or BSEE, or to both BOEM and BSEE together (as BOEM/BSEE, or the Bureaus). However, this BA is intended to represent the activities and analyses of both agencies. Thus, reference to one agency alone should not be interpreted to exclude the actions or analyses of the other.

Table 1. BOEM and BSEE activities and actions for which section 7 ESA consultation is not requested and those for which consultation is requested in this BA.

Consultation NOT Requested	report section	Consultation Requested	report section
Lease sales and issuance	2.1	DPP revisions	3.1
Exploration drilling	2.2.1	Discharges and emissions	3.2
G&G permits (high energy, deep-penetrating 2D or 3D seismic surveys)	2.2.2	Support vessel and aircraft activity	3.3
Well conductor installation	2.3	Applications for Permit to Drill and Permit to Modify (includes well stimulation treatments)	3.4
Decommissioning	2.4	Well conductor removal	3.5
		Pipeline repair and replacement	3.6
		Cable repair and replacement	3.7
		BSEE inspections: helicopter flights	3.8
		BSEE oil spill response equipment exercises	3.9

1.2 History of Federal Management of Pacific O&G Development

Leasing, exploration, development, and production of offshore O&G reserves on the Outer Continental Shelf (OCS) of the Pacific Coast began in the early 1960s. Initially, Department of Interior (DOI)'s Bureau of Land Management (BLM) was responsible for leasing areas of the OCS, and U.S. Geological Survey (USGS) provided oversight for exploration, development, and production of offshore O&G resources. In 1982, the Minerals Management Service (MMS) was formed within DOI to oversee all OCS O&G leasing, exploration, development, and production. In 2010, DOI began a reorganization plan to divide MMS into three new agencies. MMS was first renamed the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), and the revenue functions were spun off at that time into the Office of Natural Resource Revenues (ONRR). The following year, DOI split BOEMRE into the new bureaus of BOEM and BSEE. This step completed the reorganization of MMS into the independent entities of BOEM, BSEE, and ONRR.

With this reorganization, BOEM retained the authority for managing and issuing decisions on O&G leasing on the OCS, as well as approval of exploration, development, and production plans and issuance of geological and geophysical (G&G) permits. BSEE retained the authority to review and approve permits for drilling, rights-of-way, pipeline installations, and decommissioning of offshore structures, as well as day-to-day inspection and enforcement actions associated with offshore O&G production.

BOEM and BSEE have continued to maintain these responsibilities, with close coordination through their shared missions and connected functions with respect to the environment. For example, BOEM assists BSEE with environmental reviews, and BSEE provides enforcement of environmental requirements with feedback to BOEM on the effectiveness of mitigations.

1.3 Southern California Planning Area (SCPA) and O&G Production

The Bureaus' SCPA extends from the Monterey/San Luis Obispo County line southward to the U.S.-Mexico border and includes waters from 3 to 200 mi from shore (Argonne National Laboratory (Argonne) 2019). As of June 2023, there were 30 active leases, 14 of which are producing, in the SCPA, with 23 Federal platforms and 208 mi of pipelines that transport O&G to shore (Figure 1, Table 2). Eight of these 23 platforms are no longer on active leases and are in the planning stages of decommissioning. Since 1963, more than 1,450 exploration and development wells have been drilled in this area with more than 1.3 Bbbl and 1.8 trillion cubic feet of natural gas produced through September 2016.

Oil production rates peaked at more than 200,000 bbl per day in 1996 and declined in subsequent years to a production rate of about 50,000 bbl per day. Due to various operations issues such as a pipeline rupture, the production has since diminished to just over 7,000 bbl per day (as of June 2023). Once operational issues are resolved, the daily production is expected to rebound to no more than 50,000 bbl per day but will continue to diminish through time. Gas production has followed a similar declining trend with a production rate of about 77 million cubic feet per day. Gas production has also been affected by the 2015 onshore pipeline failure, resulting in a temporary rate of just over 6,712 million cubic feet per day during 2022. Overall, O&G production in the SCPA is expected to continue to decline gradually over time, with drilling and production activities continuing if O&G can be produced in paying quantities.

There are fewer than 400 active development wells at any given time, and this number may decrease with the advent of decommissioning. Approximately 260 million bbl and 540 billion cubic feet of natural gas are estimated to remain in O&G fields within reach of existing platforms in the SCPA. For a summary of the environmental setting of the Southern California OCS Planning Area, see Argonne (2019).

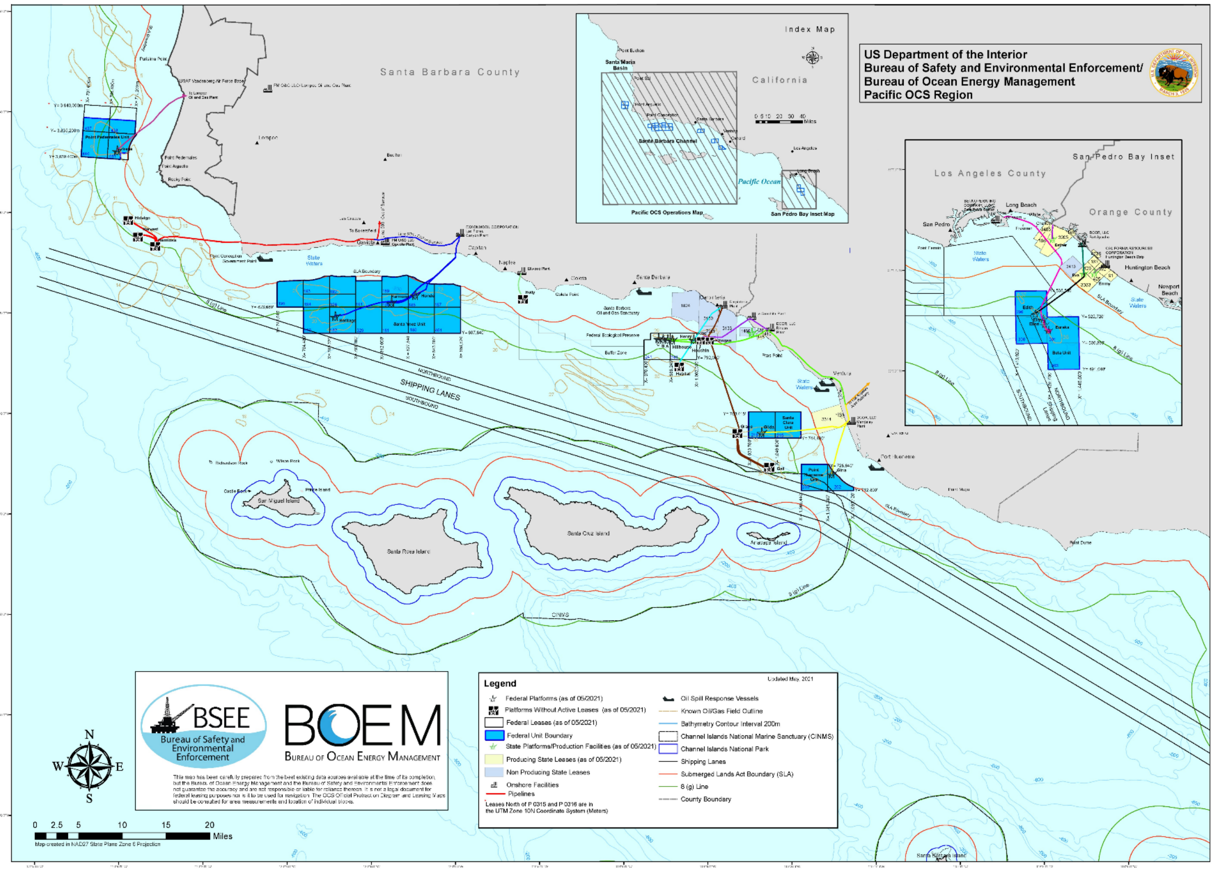

Figure 1. Existing O&G platforms and pipelines in the SCPA.
Additional maps are in Appendix B, and a PDF map is available online.

Table 2. Unit or field names and the names of associated O&G platforms in the SCPA as active or inactive, as of March 2025.
For distances from shore and depths for platforms, see Appendix B.

Unit/Field Name	Active Platforms	Inactive Platforms
Point Pedernales		Irene
Point Arguello		Hidalgo, Harvest, Hermosa
Santa Ynez	Heritage, Harmony, Hondo	
Dos Cuadras	A, B, C, Hillhouse	
Beta	Edith, Elly, Ellen, Eureka	
Carpinteria	Henry	Hogan, Houchin
Pitas Point		Habitat
Santa Clara	Gilda	Grace, Gail
Point Hueneme	Gina	

1.4 Consultation History with USFWS

BOEM and BSEE have formally consulted with the USFWS in accordance with section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 et seq.) on each offshore lease sale and on each development and production plan (DPP) submitted for review and approval to date. BOEM has also informally consulted on actions related to day-to-day management in support of existing O&G production operations.

As for consultation history regarding current and expected activities associated with development and production of O&G reserves within the SCPA of the Pacific OCS, BOEM requested programmatic ESA consultation to USFWS on March 27, 2017. USFWS requested additional information July 28, 2017. BOEM submitted an updated BA on April 8, 2019, along with a further revised BA on December 5, 2019. USFWS initiated consultation the same day. BOEM further clarified in a letter dated July 1, 2020, regarding the effect determinations. A draft Biological Opinion from USFWS was submitted to BOEM on June 1, 2021. On October 8, 2021, Center for Biological Diversity (CBD) submitted a Notice of Intent to sue BOEM for violation of the Outer Continental Shelf Lands Act, 43 U.S.C. 1331 *et seq.* related to O&G activity at the Beta Unit on the Pacific OCS. On May 20th, 2025, BOEM finalized the draft BA requesting programmatic ESA consultation to USFWS.

2 Activities Not Requesting for Consultation

This section describes activities for which consultation is not requested (Table 1). Some activities can only occur following the sale of an O&G lease, and no new lease sales, leases, or subsequent related activities are planned or currently likely to occur.

2.1 O&G Lease Sales and Issuance of Leases

A primary BOEM function is the sale and issuance of OCS leases for energy development; however, in the SCPA no O&G leases have been offered since 1984. From 1984–2008, Congressional and Presidential moratoriums were in effect that prohibited O&G lease sales offshore California. Although these moratoriums were either rescinded or allowed to expire, planning areas offshore California were not included in BOEM's 2017–2022 leasing program. DOI's Proposed Program for the 2023–2028 National Outer Continental Shelf Oil and Gas Leasing Program, published in 2022, did not propose any lease sales for the SCPA. While there is potential for new lease sales in future programs, at this time, it is unknown if they will occur in the Pacific Region.

2.1.1 No Projected Activity

There is no potential for future lease sales in the Southern California Planning Area in the 2023–2028 National OCS Oil and Gas Leasing Program, as they were not included in the Proposed Program published in 2022. Therefore, **BOEM is not considering future leasing actions for the Southern California Planning Area in this Biological Assessment.**

2.2 Approval of O&G Exploration Plans and Geological and Geophysical Permits

2.2.1 Exploration Drilling

Upon issuance of a lease, drilling of exploratory wells and associated activities are subject to BOEM-approved exploration plans [30 CFR 550.201]. Since 1963, 295 exploration wells have been drilled in the SCPA with the last exploratory well completed in 1989 (MMS 1992). These exploratory wells were drilled using jack-up rigs, mobile offshore drilling units (MODUs) or drillships. Currently **there are no active exploration plans or exploratory drilling activities occurring in the SCPA and none are anticipated in the foreseeable future.**

2.2.2 Geological and Geophysical Survey Permits

BOEM requires permits for geological and geophysical (G&G) surveys conducted (pre-lease or off-lease) for the collection of oil, gas, or sulphur data on the OCS [30 CFR 551.4]. G&G surveys are generally exploratory in nature and may include high energy, deep-penetration seismic surveys or High Resolution Geophysical (HRG) surveys.

High energy, deep-penetrating 2D or 3D surveys use high-pressure airguns and receivers to collect information from below the seafloor. Airguns may be mounted aboard or towed behind a ship while receivers are also towed or dropped on the seafloor. These often precede leasing (or are otherwise off lease) and require a permit. G&G activities on an existing lease, to further delineate known O&G production fields, for example, are authorized through the lease instrument or exploration plans rather than through permits. In the SCPA, the most recent G&G permit was issued by MMS in 1995[1]. In 1999, the California State Lands Commission (CSLC), MMS and National Marine Fisheries Service (NMFS) finalized a coordinated process for future review of G&G permit applications in the geographic area extending from the Monterey Bay National Marine Sanctuary south to the Mexican border in State and Federal waters (CSLC and MMS 1999). This High Energy Seismic Survey (HESS) review process was the result of a two-year consensus-building effort among stakeholders including National Marine Fisheries Service. In this process, NMFS was identified as the lead agency for ESA consultations for high energy seismic surveys in recognition of their requirement to issue Incidental Harassment Authorizations (IHAs) under the Marine Mammal Protection Act. USFWS has since adopted most of the NMFS recommendations and procedures for evaluating effects to species under their jurisdiction.

2.2.3 No Projected Activity

BOEM does not anticipate new exploration plans to be submitted in the absence of a leasing program for the SCPA, which is not reasonably foreseeable at this time. Likewise, requests for BOEM to permit high energy, deep-penetrating 2D and 3D G&G surveys in the SCPA are not anticipated. Accordingly, **BOEM is not considering these types of G&G surveys in this BA**. Should a G&G permit be requested, BOEM expects to coordinate and cooperate with USFWS for all survey activities that have the potential to affect listed species or CH.

2.3 Approval of Well Conductor Installation

BSEE may authorize installation of well conductors with an Application for Permit to Drill (APD). Conductors are large pipes that carry O&G from the sea floor to the deck of an offshore platform. They are inserted through “slots” in the platform structure that guide and support this component of a well. The majority of the conductors are installed when a platform is constructed, but some slots may be left empty with a conductor being installed later. Installation of a conductor may require impact, vibratory, or rotary methods to drive the conductor into the sea floor thus making this operation analogous to a pile-driving operation.

The dimensions of the conductors, equipment used, specific location and timing are important variables when considering potential sound impacts. Where sound is expected to affect marine mammals (e.g., sea

[1] A G&G permit was submitted by Beta Offshore in 2017, but requests by BOEM for further information have as of yet been unanswered. Should this permit move forward, BOEM would pursue appropriate permit-specific ESA consultation.

otters), an Incidental Harassment Authorization will be required, and USFWS will conduct an ESA consultation when specific information for a project becomes available.

2.3.1 No Projected Activity

Conductor installation has only occurred once in recent years (at Platform Harmony in 2014; see MacGillivray & Schlesinger 2014). Platforms are moving toward the end of their economic life; there are no applications to install conductors; and none are anticipated in the foreseeable future. Therefore, **BOEM is not considering conductor installation as part of this BA.**

2.4 Decommissioning

Federal offshore platforms and associated pipelines in the SCPA will be decommissioned after O&G reserves have been produced. BSEE approves permanent plugging of wells, full or partial removal of platforms and pipelines, and site clearance activities. Offshore operators are required to submit applications for decommissioning to the BSEE Pacific OCS Region at least 2 years prior to ceasing O&G production.

Detailed hypothetical decommissioning scenarios for individual platforms are described in BSEE's "Decommissioning Cost Update for Pacific OCS Region Facilities" (BSEE 2015). **Environmental impacts of decommissioning are summarized and incorporated by reference**: "Programmatic environmental impact statement for oil and gas decommissioning activities on the Pacific Outer Continental Shelf" (BOEM 2023).

BSEE supports and encourages the reuse of obsolete O&G structures as artificial reefs and is a cooperating agency in the implementation of the National Artificial Reef Plan. In California, any proposed reefing is subject to State legislation that would allow this activity. Structure removal permit applications requesting a departure from decommissioning regulations under the Rigs-to-Reefs Policy (BSEE Interim Policy Document 2013-07) undergo technical and environmental reviews. The policy document details the minimum engineering and environmental standards that operators/lessees must meet to be granted approval to deploy a structure as an artificial reef.

2.4.1 Projected Activity

The permanent abandonment of all the wells on a facility is required for decommissioning. This involves the plugging of the wells according to BSEE regulations [30 CFR 250.1710-1723]. BSEE is entertaining APDs that will assess the permanent abandoning of wells at several offshore facilities, and BOEM will perform National Environmental Policy Act (NEPA) analysis. BOEM will consult with USFWS, as necessary, on these projects.

No decommissioning applications for the SCPA have been submitted. At this time, BOEM is unable to reasonably predict when or where specific decommissioning activities will occur or describe specific activities that have yet to be proposed. BOEM expects to conduct additional consultations with USFWS after decommissioning applications are received and detailed descriptions of proposed activities are available.

3 Proposed Federal Action with Activities Requesting for Consultation

Under the ESA, "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (see 50 CFR 402.02).

This section covers activities for which we are requesting ESA consultation (Table 1). This section also includes avoidance and mitigation measures used for protection of ESA-listed species and designated CH.

3.1 Approval of O&G Development and Production Plans and Revisions

Offshore O&G development and production activities must be conducted in accordance with plans approved by BOEM [30 CFR 550.201]. The content and level of detail for DPPs in the SCPA have varied over time but all describe proposed infrastructure (e.g., platforms, pipelines and power cables), activities and general strategies for production of O&G. Several day-to-day production and development activities, including vessel and aircraft operations, are components of plans.

All major construction activities, under approved DPPs in the SCPA, have either been completed or are no longer being considered. New DPPs are not expected in the absence of a leasing program, but existing plans may be revised or supplemented if substantive changes are made.

Revisions to DPPs are necessary for the following (30 CFR 550.283):

1) Change in the type of drilling, production facility or oil/gas transportation mode
2) Change in the location of a drilling or production facility
3) Change in the type of production or significant increase in production volume or oil storage capacity
4) Increased air emissions exceeding the amount specified in the DPP
5) Significant increase in solid or liquid wastes handled or discharged
6) Request for new hydrogen sulfide area classification
7) Change in location of onshore support base from one State to another or expansion of a support base
8) Change in other activity as specified by the Regional Supervisor.

3.1.1 Projected Activity

Although BOEM cannot predict what revisions or supplements may be necessary, the Bureau is reviewing the effects of the ongoing discharges, emissions, vessel use, and aircraft use taking place under existing DPPs in this assessment, and therefore requests consultation on these DPP-related activities.

3.2 Discharges and Emissions, and Light Emittance

3.2.1 Authorized Discharges and Emissions

BOEM regulations require operators to submit a copy of their application for a National Pollutant Discharge Elimination System (NPDES) permit from the Environmental Protection Agency (EPA) with their DPPs [30 CFR 550.248]. BSEE regulations prohibit unauthorized discharges of pollutants into offshore waters [30 CFR 250.300]. Produced waters from Federal O&G activities are authorized to discharge into the ocean, with limits and conditions, under the National Pollutant Discharge Elimination System (NPDES) permit. This permit has an expiration date stated by the Environmental Protection

Agency of 2013 but is approved as the active permit by EPA, while the new drafted permit awaits finalization (https://www.epa.gov/sites/default/files/2017-08/documents/cag280000-generalpermit.pdf).

The NPDES permit authorizes 22 types of discharges from all Federal offshore platforms in southern California including drilling muds and cuttings; produced water; well treatment, completion and workover fluids (including fluids associated with hydraulic fracturing and acidization); deck drainage; sanitary wastes and domestic wastes; non-contact cooling water; and fire control test water. In 2013, EPA re-evaluated the potential effects of these discharges on ESA listed species and CH for the offshore lease blocks considered active by BOEM. They concluded that readily available evidence supports the conclusion that the discharges would have no effect on endangered or threatened species (EPA 2013a, EPA 2013b).

BOEM air emission information requirements for DPPs are found at 30 CFR 550.249. In the SCPA, responsibility for air quality management is delegated by EPA to local air quality control boards that monitor and enforce air quality requirements for offshore O&G development and production. BOEM and BSEE work with the local air quality control boards to ensure that their requirements are met.

3.2.2 Platform Light Emittance

Offshore platforms have lighting of all decks for safety and support of operations at night. Light emittance measured at three platforms (Grace, Hermosa and Heritage) showed integrated density values from 390 to 806 over a 12 km^2 (4.6 mi^2) area for each platform (Hamer et al. 2014). On a clear night, all California platforms are visible from the nearby coast.

3.3 Support Vessel and Aircraft Activity

Day-to-day offshore O&G development and production operations require routine personnel and equipment transfers. Crew and supply boats depart the coast approximately 30 times per day along pre-determined routes from Seal Beach Pier (public pier, Orange County), Terminal Island (Port of Los Angeles), Port Hueneme, Carpinteria Pier (private pier, Santa Barbara County) and Ellwood Pier (private pier, Santa Barbara County) to nearby offshore platforms. Support vessels for activities in the Santa Barbara Channel and Santa Maria Basin operate out of bases in the Santa Barbara Channel. Support vessels traveling to and from the four platforms in San Pedro Bay operate out of Long Beach. Support vessels in the Pacific Region, including both crew and supply boats, have averaged approximately 16 trips per week per platform (Bornholdt and Lear 1995; 1997). Actual vessel traffic varies among units; as detailed in the analyses below.

Typical vessels used during support activities may include crew vessels, oil spill prevention and response vessels, platform supply vessels, anchor handling or tug supply vessels, diving support vessels, inspection maintenance and repair vessels, and vessels for remotely operated vehicle (ROV) support.

Smaller vessels for spill prevention and response and crew transport may be 15 m (50 ft) in length and are capable of travel at speeds of 25 kn. Larger vessels are 100 m (328 ft) in length, can carry 1,000–2,000 m^3 (6,289–12,579 bbl) of fuel, and are powered by several thrusters, including powerful (~3,000 kW) stern thrusters and smaller 800–1,000 kW thrusters for maneuvering. These vessels travel slower (10–16 kn).

OCS helicopter traffic in the Pacific Region operates primarily out of Santa Maria, Lompoc, and Santa Barbara airports. Approximately 3–4 helicopter trips per day are used to transport personnel from the Santa Maria Airport to platforms north of Point Conception. Most of this traffic is to and from platforms in the western Santa Barbara Channel and Santa Maria Basin. Larger pieces of equipment and certain support services (e.g., commercial dive services) are mobilized from the Port of Long Beach, the Port of Los Angeles, Port Hueneme and, to a limited extent, Santa Barbara Harbor. BSEE inspectors use the

Camarillo airport as a base of operations for their helicopter activities. Helicopter traffic has increased; in the past, helicopters averaged approximately 3 to 5 trips per week per platform (Bornholdt and Lear 1995; 1997).

3.4 Approval of Applications for Permit to Drill and Permit to Modify

3.4.1 Production Drilling

General plans for drilling for O&G are included in exploration plans and DPPs approved by BOEM. However, drilling of individual wells must be reviewed and approved by BSEE [30 CFR 250.410]. An APD is used to approve drilling specifications for new wells, new sidetrack wells, and bypasses or deepening of existing wells. Drilling of new wells may also include the installation of conductors which establish a conduit from the deck of the platform into the sea floor.

An Application for Permit to Modify (APM) is required when an approved APD is revised or materially changed [30 CFR 250 subpart D]. Well completion and workover operations, for example, are conducted to establish, maintain or restore production of a well and are generally approved with an APM [30 CFR 250 subparts E and F]. These operations may include hydraulic fracture treatments and other well stimulation techniques (e.g., acidization) that are designed to enhance recovery of O&G resources. BSEE may also issue well completion or workover field rules to modify specific requirements [30 CFR 250.512 and 30 CFR 250.612].

3.4.2 Well Stimulation Treatments

BSEE may authorize several types of well stimulation treatments through their approval of an APD or APM. These include:

Diagnostic Fracture Injection Test – A diagnostic fracture injection test is used to estimate key reservoir properties and parameters that are needed to optimize a main fracture job. It is a short duration procedure that involves the injection of typically less than 100 bbl of fracturing fluid at pressures high enough to initiate a fracture. Key parameters are estimated from the fluid volume injected and the pressure dissipation profile. The fluid used in a diagnostic fracture injection test is typically the fluid that would be used in the main fracture treatment but with no proppant[2] added, thus allowing the fracture to close naturally as pressure is released.

Hydraulic Fracturing – Hydraulic fracturing involves the injection of a fracturing fluid at a pressure (as typically determined by a diagnostic fracture injection test) needed to induce fractures within the producing formation. The process generally proceeds in three sequential steps: (1) injection of a fracturing fluid without proppant to create fractures which extend out from the well; (2) injection of a slurry of fracturing fluid and proppant; and (3) injection of breakers, chemicals added to reduce the viscosity of the fracturing fluid. Upon release of pressure, the fracturing fluid is allowed to flow back (the flowback fluid) to the surface platform. Key fluid additives include polymer gels which increase the viscosity of the fluid and allow it to more easily carry proppant into the fractures, crosslinker compounds that help further increase the fluid viscosity, and breaker chemicals which break down the crosslinked polymers and allow them to return more readily to the surface after fracturing is completed. Other

[2] A proppant is a solid material, typically sand, treated sand, or man-made ceramic materials, designed to keep an induced fracture open during or following a fracture treatment.

important additives may include pH buffers, clay control additives, microbial biocides, and surfactants to aid in fluid recovery. In offshore applications, the base fracturing fluid is filtered seawater.

Acid Fracturing – Acid fracturing is similar to hydraulic fracturing except that instead of using a proppant to keep fractures open, an acid solution is used to etch channels in the rock walls of the fractures, thereby creating pathways for O&G to flow to the well. As with a hydraulic fracturing well stimulation treatment, a pad fluid is first injected to induce fractures in the formation. Next, the acid fracturing fluid is injected at pressures above the formation fracture pressure and allowed to etch the fracture walls. The acid fracturing fluid is typically gelled, cross-linked, or emulsified to maintain full contact with the fracture walls. Fifteen percent hydrochloric acid (15% HCl) solutions are typically used in carbonate formations such as limestone and dolomite, while hydrofluoric acid (HF) solutions and HCl/HF mixtures are used in sandstone and Monterey shale formations and in other more heterogeneous geologic formations, typically at levels of 12% and 3%, respectively. The fracturing fluid typically also includes a variety of additives at a combined concentration on the order of 1% or less, such as inhibitors to prevent corrosion of the steel well casing, and sequestering agents to prevent formation of gels or iron precipitation which may clog the pores.

Matrix Acidizing – In matrix acidizing, a non-fracturing treatment, an acid solution is injected into a formation where it penetrates pores in the rock to dissolve sediments and muds. By dissolving these materials, existing channels or pathways are opened and new ones are created, allowing formation fluids (oil, gas, and water) to move more freely to the well. Matrix acidizing also removes formation damage around a wellbore, which also aids oil flow into the well. The acid solution is injected at pressures below the formation fracture pressure and is thus a non-fracturing treatment. Three distinct fluids are commonly used sequentially: (1) an HCl acid preflush fluid; (2) a main acidizing fluid generated from mixing HCl and ammonium bifluoride to produce an HCl/HF mud acid at typically 12% and 3%, respectively (some operations use mud acid while some operations primarily use 15% HCl); and (3) an ammonium chloride overflush fluid. The acidizing fluid also includes a variety of additives at a combined concentration of on the order of 1% or less, similar to those used in acid fracturing.

No well stimulation treatments have been approved since 2014. Of the more than 1,630 exploration and development wells drilled in Federal waters on the Pacific OCS between 1982 and 2014, a small percentage were hydraulically fractured completions, occurring on four of the 23 platforms in the Southern California Planning Area. Three of these were in the Santa Barbara Channel, and the fourth was in the Santa Maria Basin. Only three matrix acidizing treatments, defined as well stimulation treatments, occurring in OCS waters during a similar time frame (between 1985 and 2011) have been identified in records, and these were conducted on two of the 23 platforms.

3.4.2.1 Projected Activity

Well stimulation treatments have occurred infrequently, and none have been approved since 2014. Further, BSEE is currently enjoined by court order from approving any well stimulation treatments. Nevertheless, to promote comprehensive analysis of potential future activities, the Bureaus provide analysis of and seek consultation on the well stimulation treatments described in this BA.

3.4.3 Well Conductor Removal

BSEE may authorize removal of well conductors. Conductor removal may occur as a precursor to platform decommissioning.

Removal involves conductor cutting below the mudline (BML) followed by conductor extraction and sectioning (BOEM 2020, 2021). Cutting would use high-pressure abrasive cutting to sever conductor tubing and any internal casing strings at 4.6 m (15 ft) or more BML. Abrasive cutting methods include using hydraulic pressure to pump an abrasive fluid composed of seawater and an abrasive material such as garnet or iron silicate to cut through conductor piping and casings. A typical conductor cut would require about seven hours and use about 1,600 kg (3,500 lb) of iron silicate abrasive (BOEM 2021), which would be discharged to the ocean. In deep water, mechanical cutting methods might be required to sever conductors. Conductor severing, hoisting, and segmenting equipment would be installed on a platform at the time of use. Marine growth would be cleaned off of conductor exteriors using high pressure water, and then discharged into the ocean.

As of April 2020, POCSR production platforms had from 12 to 64 conductors individually and 818 in all; 59 of which were empty conductor tubes through which wells had not been drilled (InterAct 2020). BSEE expects to review and approve conductor removals as additional platforms move toward decommissioning.

3.4.3.1 Projected Activity

BSEE expects to review and approve conductor removals (APMs) when platforms move toward decommissioning.

3.5 Approval of Pipeline Repair and Replacement

Repair, replacement (aka, replacement installation), modification, or removal of offshore O&G pipelines requires approval by BSEE [30 CFR 250.1000]. All planned pipelines in the SCPA have been installed. However, BSEE may receive requests for repair of existing pipelines

No pipeline applications are pending or expected at this time, however, BOEM expects to coordinate and consult with USFWS as pipeline applications are received and when specific information (e.g., location, timing, methods and equipment requirements) for a project proposal becomes available.

BOEMRE (2011) describes activities for a pipeline replacement-installation project and assessed potential environmental impacts in the SCPA. Therefore, we **incorporate by reference** this EA (i.e., BOEMRE 2011). Similar mobilization of vessels is necessary for cable repair projects as with pipelines, so we also **incorporate by reference** two EAs for cable repairs in the SCPA: MMS (2008) and MMS (2009). Based on these EAs, we estimate that the project duration for pipeline repair and replacement installation would be approximately 30 days.

Project phases for pipeline repair/replacement installation may include topside modifications to offshore platforms, pipeline installation (including concrete mattress installation), pipeline tie-in, ITube and clamp installation, and pigging and hydrotesting of the repaired pipeline. The primary vessel planned for the activity would be a dynamically positioned (DP) vessel, assisted by a crew boat and support vessel. The use of a DP vessel reduces impacts to the marine environment compared to a lay barge by eliminating anchoring activities and reducing the number of vessels needed for construction operations (BOEMRE 2011, MMS 2008, MMS 2009).

3.5.1 Projected Activity

While no pipeline applications are pending or expected at this time, BSEE may receive requests for repair, replacement, or removal of existing pipelines.

3.6 Approval of Cable Repair and Replacement

Repair, replacement (aka, replacement installation), modification, removal, or abandonment of offshore O&G cables requires approval by BSEE through right-of-way permits. All planned cables in the SCPA have been installed. However, BSEE may receive requests for repair of existing cables.

Project phases may include use of an ROV to locate areas to replace as well as make cuts to cable, cable lay in the right of way (including concrete mattress installation and/or span supports) and testing of repaired cable before energizing.

While no cable applications are pending or expected at this time, BSEE may receive requests for repair, replacement, or removal of existing cables. If so, the Bureau(s) expect(s) to coordinate and consult with USFWS as cable applications are received and when specific information (e.g., location, timing, methods and equipment requirements) for a project proposal becomes available.

The primary vessel planned for the activity would be a dynamically positioned (DP) vessel, assisted by a crew boat and support vessel. The use of a DP vessel reduces impacts to the marine environment compared to a lay barge by eliminating anchoring activities and reducing the number of vessels needed for construction operations (BOEMRE 2011, MMS 2008, MMS 2009).

Based on BOEMRE (2011) and MMS (2008, 2009), we estimate that project duration for cable repair and replacement installation would be approximately 30 days.

3.6.1 Projected Activity

While no cable applications are pending or expected at this time, BSEE may receive requests for repair, replacement, or removal of existing cables. We previously consulted with NMFS on cable repair and replacement activities in the SCPA as described in two EAs (MMS 2008, 2009) that here we **incorporate by reference**. We conducted informal consultations on ESA, MMPA, and EFH with NMFS for these types of activities (MMS 2008, 2009). NMFS concurred with MMS's determination of no effect on protected species, and temporary and minimal effects to EFH with no conservation measures requested (MMS 2008, 2009).

3.7 BSEE Inspection Program: Helicopter flights

BSEE inspectors are on duty every day of the year to ensure compliance with BOEM and BSEE requirements. BSEE maintains a contract for helicopter services for flights from Camarillo Airport to offshore platforms. A BSEE inspection visit includes the departure of a helicopter from shore, stops at one or more platforms, and then return to shore. BSEE's average flight usage and number of visits to SPCA platforms for 2017–2022 was 45,000 to 50,000 mi per year and about 200 to 300 platform visits per year. For example, there were 194 visits for April 2021 through March 2022 (Table 3).

BSEE minimizes flight time by inspecting platforms in proximity to each other or dropping off inspectors at closer platforms before continuing to outlying platforms. Flight time is divided among all the facilities, but flight time to individual facilities varies depending on activity levels or complexity of the inspection mission and proximity of the platform to Camarillo Airport. Helicopter flight paths generally minimize distance between points and are above 500 feet, but can vary depending on safety needs and weather. BSEE inspectors never use an operator's helicopter to access platforms. Operator air craft and vessels addressed in Support Vessel and Operator Aircraft Activity above.

Table 3. BSEE platform visits in the SCPA tallied by unit, April 2021–March 2022 (1 year, 194 total).

Unit or Field Name	Point Pedernales	Point Arguello	Santa Ynez	Dos Cuadras	Carpinteria	Pitas Point	Santa Clara	Point Hueneme	Beta
# Visits by Helicopter	9	25	20	53	8	8	33	7	31

3.7.1 Projected Activity

BSEE helicopter use for platform visits is expected to continue at about 200 to 300 visits annually.

3.8 BSEE Initiated Oil Spill Response Equipment Exercises

BSEE is expected to ensure that offshore operators have oil spill response plans that they are prepared to implement should an oil spill occur. To meet this expectation, BSEE periodically directs operators to deploy industry-owned oil spill response equipment listed in their response plans. For any given exercise, equipment deployed may include oil spill boom, mechanical skimmers, response vessels, oil storage equipment, aircraft and marker buoys as described below. Equipment deployments during an exercise generally occur for a few hours and rarely longer than a day. BSEE exercises are held during daylight, unless a low-visibility response capability needs to be evaluated.

3.8.1 Oil Spill Boom

Booms are floating, physical barriers to oil, made of plastic, metal, or other materials, which slow the spread of oil and keep it contained. While booms can be seen above the waterline, they may have between 18 and 48 inches of material known as a "skirt" that hangs beneath the surface. The largest booms are used for offshore responses. Containment boom comes in lengths of 500 feet or more that can be connected to reach 1,500 feet. Depending on the cleanup tactic being exercised, boom can be deployed directly from a facility by its assigned small boats[3] or by an oil spill removal organization (OSRO) deployed to the scene. Offshore, boom may be deployed to completely encircle a platform. It may also be deployed in various configurations (i.e., U-shape, V-shape, J-shape) by one to three vessels coordinating their operations to simulate tactics for corralling spilled oil. When boom is deployed in the U-shaped, V-shaped, or J-shaped configurations, it is often done so in conjunction with a deployment of mechanical skimming device(s). Nearshore (defined here as in the ocean outside the surf zone and within 1 mile of shore) boom designed for oil diversion or exclusion from sensitive areas can be of various shapes and lengths. Depending on the environmental conditions (i.e., sheltered harbor, fast currents) different boom sizes, means of floatation, and their means of inter-connection will need to be evaluated and selected. Boom deployed in nearshore and on-shore environments generally are moored in place with the use of anchor and weight systems or onshore staking.

3.8.2 Mechanical Skimmers

Skimmers are mechanical devices that remove free floating or corralled oil from the surface of the water. Depending on the specific model these devices can pump anywhere from 100 to 1,000 gallons per minute (gpm). Two general types are commonly used in the Pacific Region. Weir skimmers come in several configurations and essentially work like a dam. The weir is adjusted to a height when deployed where oil floating on the water is drawn over the top of the dam at a collection inlet and stored in a compartment connected to a pump inside the skimmer. Oleophilic surface skimmers are constructed with materials that attract oil and repel water. The material is incorporated into belts, disks, mop chains, or brushes which are squeezed or scraped in the skimmer to collect oil into various storage devices. Both types of skimmers can be constructed as a permanent part of a vessel's physical design or to float free from a vessel.

[3] Presently, six of the Federal platforms and four platforms in state waters have boom stored onboard. The remaining facilities rely on boom supplied by an oil spill response organization.

For offshore oil cleanup, weir and oleophilic skimmers are generally deployed and maneuvered by vessels through an oil slick to actively collect the oil. For example, a vessel can extend a short length of boom on a fixed arm (side collector) to herd oil to an inlet leading to a skimmer. As the vessel moves forward, oil is forced to accumulate in the apex of the boom where the skimmer is located, thereby concentrating the oil by increasing the amount of oil relative to water at the skimmer. Skimmers can also be deployed at an opening at the apex of two booms being towed between two vessels to recover oil that is forced into the apex. In this configuration, the collected oil is typically pumped to a storage barge or other vessel with containment tanks stationed near the apex. When mechanical skimmers are deployed and operated during an exercise, they are typically done so for approximately ten minutes to ensure that they are working properly.

3.8.3 Oil Spill Response Vessels

Self-propelled vessels stationed specifically at offshore facilities or provided by an oil spill response organization can engage in a variety of spill response activities. They serve as platforms to deploy and maneuver boom and mechanical skimmers, ferry equipment and personnel, conduct spill surveillance, apply dispersants, and to tow temporary oil storage devices and barges. Vessels used for these activities range in size from 3.6-m (12-ft) skiffs to 63-m (207-ft) oil spill response vessels. Some vessels used for spill response can achieve speeds up to 30 kn. They are usually dispatched within the first hour of a deployment exercise and achieve their highest speeds when transiting to the site of the simulated spill. Once on scene, vessels generally transit at very low speeds (0 to 5 kn) to conduct spill response operations.

3.8.4 Oil Storage Equipment

Towable temporary oil storage devices are designed to hold and transport recovered oil from a spill site. They are made of rubber or polymer-coated fabrics of various weights and designs and have capacities that range from a few gallons to more than 300,000 gal (7,143 bbl). There are three types of towable temporary oil storage devices in use today. The first is a towable, rectangular-shaped, pillow tank, similar to those used on land (i.e., emergency potable water storage), but equipped with special tow rigging. The second type is a towable flexible tank, or "bladder," which is long and cylindrical in shape. When full, it is largely submerged and is characterized by flexibility along the length of the device. The third type of device is a towable open tank, an inflatable barge-type vessel with an open-top storage bag suspended inside the main structure. In addition to the temporary oil storage devices, metal or inflatable barges (sometimes called mini-barges) designed for temporary oil storage can be towed or pushed by a vessel during an exercise. These barges generally have a maximum storage capacity of 250 bbl and can be of various lengths.

3.8.5 Oil Spill Response Aircraft

Helicopters are versatile platforms that can be used for a number of spill response activities. During an exercise, they may be deployed from the local Santa Barbara area to demonstrate remote sensing capabilities or simulate dispersant application in a designated offshore area. For the latter activity, helicopters equipped with 32-ft sprayer arms or suspended 946-L (250-gal) buckets would fly over the exercise area and discharge water to simulate dispersant application. Helicopters may also be deployed in an exercise to drop an incendiary device such as a Helitorch to practice in-situ burn operations. However, it is anticipated that the latter exercise activity would be seldom performed and if conducted, would not involve a device that was actually ignited. Similar to rotary wing assets, fixed wing assets may be deployed in exercises to demonstrate remote sensing and dispersant application activities. For exercises in the Pacific Region, a King Air BE90 aircraft in Concord, California and a C-130 aircraft in Mesa, Arizona could be activated to conduct a coordinated simulated dispersant application operation. In such an exercise, BSEE would request the activation of both assets so that the King Air could provide spotter information to the pilots of the C-130 as the latter aircraft sprayed water in simulated dispersant application runs. This type of coordinated air operations would occur during an actual spill response and BSEE would use an exercise to evaluate the response times and effectiveness of the coordinated operations by the Oil Spill Response Plan (OSRP) plan holder. Aerostats are balloon-like systems that are self-contained, compact platforms that can deploy multiple sensor payloads and other devices into the air. They can generally lift payloads less than 22 kg (50 lbs) and up to 152 m (500 ft) into the air using a winch-controlled launch and recovery system from a vessel or platform. They are used to survey the extent of an oil spill and provide responders with real-time data to better guide operations.

3.8.6 Marker Buoys

Buoys may be used to demarcate the location of the simulated oil slick. They usually have a weighted, cone-shaped buoy body with a vertically extending narrow, fiber glass pole topped with a highly visible flag. Response vessels are to “capture the flag” to show success in a drill.

3.8.7 Projected Activity

Normally three BSEE-initiated oil spill exercises involving table-top scenarios and/or equipment deployments are conducted annually. However, more than three exercises may be initiated by BSEE, if an owner/operator needs to be retested or if new oil spill response plans are approved in the Region.

3.9 Mitigation Measures

The Bureaus have developed mitigation measures and best management practices (BMPs) for environmental protection, which operators are expected to follow the measures when conducting actions on or near the OCS. These measures in addition to avoidance and mitigation measures specifically for protecting ESA-listed species and CHs that apply to this BA are listed below.

3.9.1 Artificial Lighting Mitigation

The following measures will be incorporated into proposed projects when potential lighting effects to birds have been identified:

- Lighting on project vessels will be directed inboard and downward, or shielded, to reduce the potential for birds to be attracted to work areas.
- Light from cabin windows will be reduced with shades, blinds or shields that block exiting light.
- A protected species observer (PSO) will routinely inspect lighted work areas for birds that may have been attracted to artificial lighting.
- If an injured bird is discovered on a platform or vessel, the bird will be transported on the next returning work vessel to an approved wildlife care facility.
- A log of all birds found onboard a platform or vessel that may have been attracted by artificial light during a particular project will be maintained with the status and health of birds on retrieval and release. The log will be provided to BOEM when the project has been completed.

3.9.2 Oil Spill Response and Reporting Regulations

BSEE regulations require that each OCS facility have a comprehensive Oil Spill Response Plan. Federal regulations (30 CFR Part 254) specify oil spill response requirements for offshore O&G facilities. Operators of oil handling, storage, or transportation facilities must submit a spill response plan to the BSEE to demonstrate their ability to respond quickly and effectively whenever oil is discharged from their facility. Response plans consist of an emergency response action plan, and supporting information that includes an equipment inventory, contractual agreements with subcontractors, a worst-case discharge scenario, a dispersant use plan, an in-situ burning plan, and details on training and drills. Each response plan must be reviewed by the operator at least every two years and submitted with modifications to the BSEE for review and approval.

Operators must report any spill that is 1 bbl or greater in the SCPA. The development of more stringent regulations, implementation of rigorous inspection programs, imposition of civil and criminal penalties, and changes in equipment and procedures have all contributed to a safer work environment. Also, BSEE has promulgated regulations that require offshore operators to develop safety and environmental management systems, which are intended to foster a corporate culture of environmentally responsible and safe working conditions.

3.9.3 Project Monitoring-related Measures

Projects submitted to BOEM and BSEE have incorporated a Marine Wildlife Contingency Plan (MWCP) and PSOs. An MWCP includes measures designed to reduce the potential impacts on marine wildlife by the proposed operations. An MWCP is implemented in compliance with measures developed in consultation with NMFS and USFWS based on complying with the ESA and the Marine Mammal Protection Act (MMPA).

An MWCP is implemented by a team of experienced PSOs. PSOs are stationed aboard vessels throughout the duration of a project. Reporting of the results of the vessel-based monitoring program will include documentation of compliance with ESA and MMPA-related measures and data on the occurrence, distribution, and activities of marine wildlife in the areas where the survey program is conducted. An MWCP will be developed for projects where appropriate, and the details of the monitoring elements will be identified at the individual project level.

3.9.4 Pre-Activity Environmental Orientation

A biologist will present an environmental orientation for all project personnel prior to conducting work. The purpose of the orientation is to educate project personnel on identification of wildlife in the project area and to provide an overview of minimization and mitigation measures that will be implemented during projects, including any daily reports or project final reports. Specifically, the orientation will include, but not be limited to, the following:

- Identification of wildlife expected to occur in the project area and periods of occurrence in the project area;
- Overview of the ESA and MMPA regulatory agencies responsible for enforcement of the regulations, and penalties associated with violations;
- Procedures to be followed during mobilization and demobilization, transiting of project vessels, and the implementation of shutdowns and ramp-ups throughout the duration of the project; and
- Reporting requirements in the event of an injurious encounter with a listed species, protected marine wildlife, or sensitive habitats.

4 Action Area

The “action area” means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area encompasses the SCPA and the surrounding regions that could be affected by activities associated with continuation of O&G development, and production, (Figure 2). The SCPA extends from the Monterey/San Luis Obispo County line southward to the U.S.-Mexico border, including waters 3–200 mi from shore. The action area’s boundaries are drawn broadly to identify a general region in which activities and effects may occur. Not all areas within the boundaries of the action area will be affected. For example, the boundary includes areas potentially affected by a large oil spill; however, large spills are unlikely, and a large spill of the size estimated for this BA would not affect the entire action area. Similarly, vessel activities and potential impacts associated with the proposed action will not be distributed uniformly throughout the entire action area, as those activities are expected to occur along more specific routes between O&G platforms, infrastructure, and local ports.

This section describes the existing conditions of the action area and stressors unassociated with the proposed action (i.e., environmental conditions) that may impact ESA-listed species or CH within the action area.

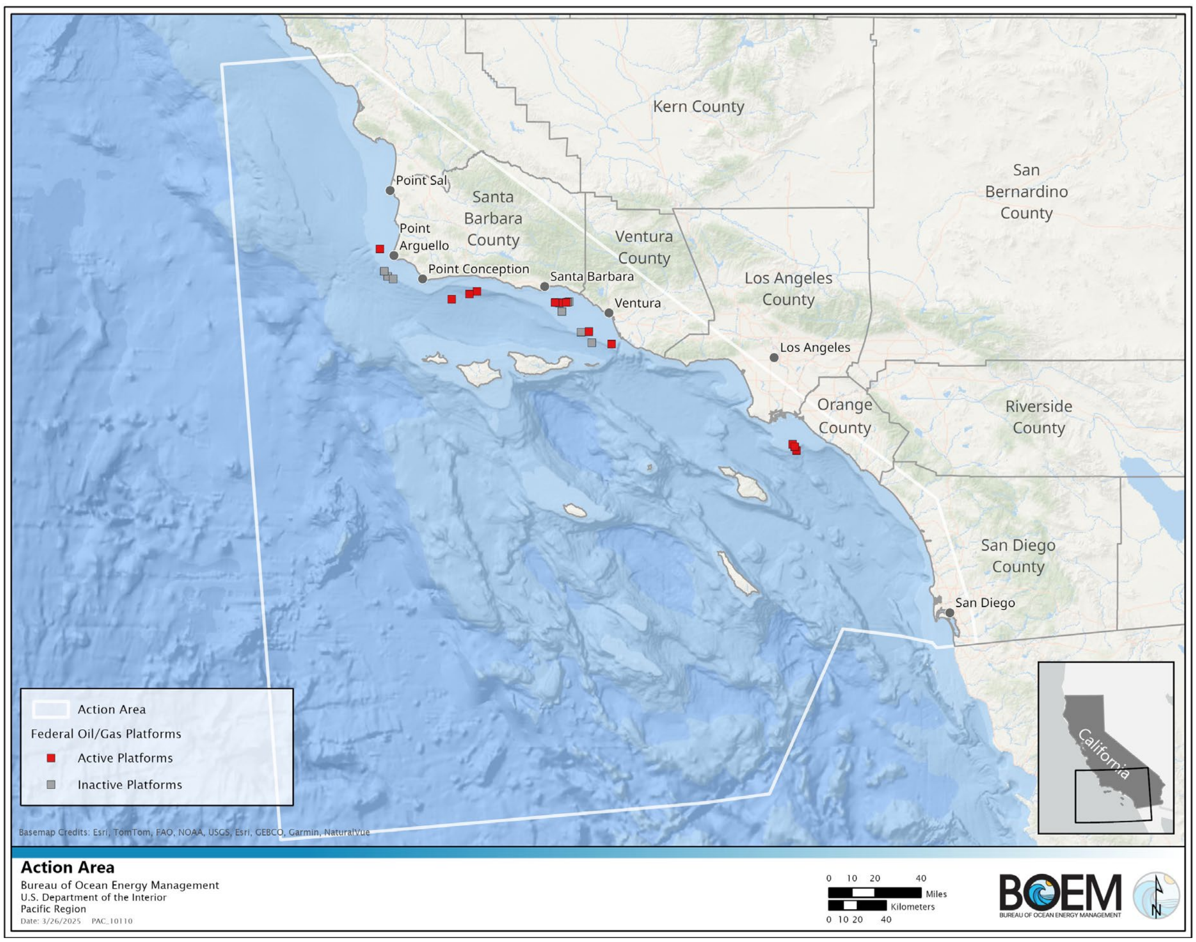

Figure 2. Action area (white outline) for assessment of O&G activities in the SCPA
Federal platforms shown for active (red squares) and inactive (gray squares) platforms.

4.1 Offshore Waters

Much of the offshore waters within the action area remains undeveloped other than structures and pipelines associated with O&G production and development, as well as maritime facilities such as piers and jetties. The offshore waters are a major cargo shipping area, and large container ships and other vessel traffic frequently use the area. The intertidal area within the action area typically contains both rocky intertidal habitat and sandy beach habitat.

4.2 Coastal Areas

Coastal areas within the action area range from completely undeveloped (such as in the southern Big Sur area) to largely developed (such as areas of Los Angeles County). The onshore area contains sandy beach habitat as well as salt marsh and coastal lagoon habitats. The onshore area contains areas of high human use (such as Oceano Dunes State Vehicular Recreation Area) as well as lower-use areas (such as near Jalama Beach Park). Development in coastal areas within the action area will likely continue throughout the time period considered in this BA.

4.3 Vessel Traffic

4.3.1 Noise from Vessel Activities

In this section, we describe the known noise associated with vessel activities within the action area.

The SCPA has near-constant vessel traffic. The Santa Barbara Channel is a part of an international shipping route leading to and from the Ports of Los Angeles and Long Beach, one of the busiest port complexes in the world. Automatic Identification System (AIS) data (Figure 3.) showed more shipping activity in 2021 than in 2020, with 1,159 large vessels (> 300 tons) transiting 714,749 nmi–a 23% increase in the number of ships transiting through this area and a 12.6% increase in the overall number of nautical miles traveled within this zone.

Vessel traffic in the Santa Barbara Channel 2007–2010 increased background noise levels by 10–13 dB in the 71–224 Hz range (Hatch et al. 2012; McKenna et al. 2012; Rolland et al. 2012), and a reduction of 1 ship transit per day decreased noise by 1.2 dB.

Vessel noise is a combination of narrowband tones at specific frequencies and broadband noise is determined by factors such as ship type, load, and speed, and ship hull and propeller design. Broadband noise, caused primarily by propeller cavitation and flow noise, may extend up to 100 kHz, but peaks much lower, at 50–150 Hz. Richardson et al. (1995) give estimated source levels of 156 dB for a 16-m crew boat (with a 90-Hz dominant tone) and 159 dB for a 34-m twin diesel (630 Hz, 1/3 octave). Broadband source levels for small, supply boat-sized ships (55–85 m) are about 170–180 dB.

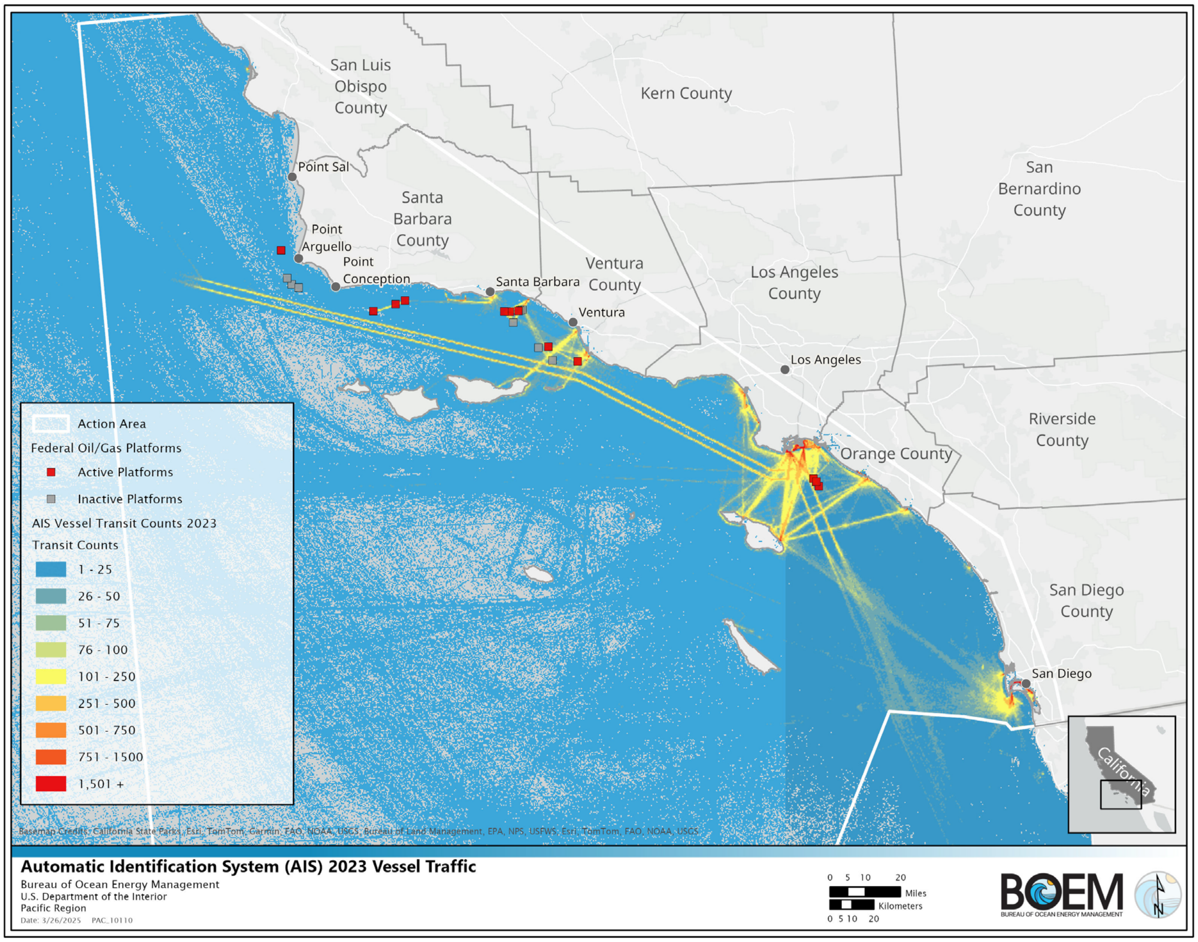

Figure 3. AIS Vessel transit data for 2023.
Numbers of vessel transits shown as a color gradient from blue (lowest) to red (highest); whitish areas had 0 transits recorded. Data are shown relative to the action area (white outline) and O&G platforms (red and gray squares).

4.3.2 Vessel Collision: Strike Risk

Some risk of a vessel strike exists for all vessels in the U.S. West Coast waters, including the action area. However, there is a large amount of uncertainty surrounding what the true number of ship collisions and mortalities are for listed species within the action area. For instance, Garshelis (1987) reported that sea otters in southern Alaska tend to avoid areas with frequent boat traffic but will reoccupy those areas in seasons with less traffic. However, the vessel traffic corridors through the SCPA generally pass 4 km or more offshore. Additionally, the O&G industry contributes only a small fraction to the total vessel traffic in the area (Fig. 6). Thus, the likelihood of vessel collision incidents within the SCPA would be low.

The Pacific Coast Port Access Route Study (USCG 2023) evaluated safe access routes for vessels to or from ports along the western seaboard of the United States. From this, the U.S. Coast Guard (USCG) recommended establishing voluntary vessel traffic fairways, including a coastwide fairway that connects with existing Traffic Separation Schemes (Strait of Juan de Fuca, San Francisco, Santa Barbara, and Los Angeles–Long Beach) and key ports. The study also recommended a Point Mugu Fairway to direct traffic from Los Angeles and Long Beach around Channel Islands National Marine Sanctuary and to make accommodations for Department of Defense training and testing ranges (88 FR 36607). If these fairways are implemented by the Coast Guard in the future, there could be some impact on vessel traffic patterns in the action area, although to what extent is uncertain at this time.

4.4 Oil Spill

During typical day-to day platform operations, accidental discharges of hydrocarbons (i.e., oil spill) may occur within the action area. Such accidents are typically limited to discharges of quantities of less than one barrel (bbl) of crude oil (Appendix A, Table A-1). From 1963 to 2022, 1,451 oil spills were recorded. The total volume of oil spilled in the Pacific Region is dominated by the 1969 Santa Barbara Spill (80,900 bbl) from a loss of well control on Platform A which occurred soon after production began (Van Horn et al. 1988). During 1970–2022, there were 1,449 oil spills with an average volume of 1 bbl/spill and a total volume of 1,508 bbl, which represents less than 2% of the volume spilled in 1969.

The largest spill during 1970–2022 was the 588 bbl Beta Unit spill ("Huntington Beach" spill) in October 2021 from Amplify Energy Corporation's San Pedro pipeline P00547 (Appendix A, Table A-1). In a settlement agreement (Case No. 8:21-cv-01628-DOC-JDE, Document 476-4, U.S. District Court for the Central District of California, 2022), the corporate defendants asserted that the spill was a result of severe damage to pipeline P00547 from two container ships that repeatedly dragged their anchors across it. Without accepting responsibility, the shipping companies agreed to contribute funds to the remediation process. Species affected by the 2021 Huntington Beach spill are listed in Appendix B.

The next 6 largest spills were (in descending order of size; Appendix A, Table A-1): 164 bbl in 1997 due to a pipeline break in the flange metal in State waters due to welding flaws; 150 bbl in 1996 due to equipment failure and error allowing emulsion to flow through flare boom; 101 bbl in 1990 from mineral oil mud released due to incorrectly positioned standpipe and closed valves; 50 bbl in 1994 due to process upset resulting in overflow of oil/water emulsion from tanks into disposal tube; and 50 bbl in 1991 after a pipeline riser ruptured when snagged by grappling hook used by workboat to retrieve a lost anchor. The source of oil spilled in 2012 (35.78 bbl; Appendix A, Table A-1) was primarily from Platform Houchin caused by a burst plate (35 bbl, per USCG).

The SCPA has experienced significant changes in the status of the O&G fields being developed and produced. Reservoir pressures have dropped to near zero in the majority of the fields now in production. In these cases, secondary[4] or tertiary[5] recovery methods are being used to force oil to the surface. The risk of a loss of well control (a blowout) resulting in a spill is exceedingly small under these conditions.

4.5 Discharges to the Action Area

Discharge sources within the action area include publicly owned treatment works, stormwater runoff, shipping, and natural oil seeps. The four largest treatment facilities each discharge over 100 million gallons of wastewater per day (Lyon and Sutula 2011). Three of the large treatment facilities are in Los Angeles and Orange Counties near the San Pedro Bay Basin platforms. The fourth large facility serves San Diego.

[4] Secondary refers to the reinjection of water or gas produced from the reservoir in order to push oil to the surface.

[5] Tertiary refers to the addition of chemicals designed to increase oil flow within a well.

Untreated stormwater runoff from the watersheds into the Southern California Bight represents a large non-point source of pollutant and nutrient loads. Noble et al. (2003) found that 58% of the shoreline failed to water quality standards during wet weather, typically from late fall to early spring. Ackerman and Schiff (2003) compared stormwater runoff and public treatment emissions and found somewhat comparable contributions of heavy metals. The nutrient contributions differed, with stormwater contributing about 1% of the ammonia of treatment facilities, but an order of magnitude more nitrate. Lyon and Sutula (2011) found that regional stormwater runoff loads of suspended solids, nitrate-N, cadmium, chromium, copper, lead, mercury, zinc, and total DDT (a pesticide) estimated earlier by Ackerman and Schiff (2003) exceeded the levels discharged by large publicly-owned treatment works in 2009.

Other minor sources of chemical releases to coastal waters are related to shipping. These include lubricating and hydraulic fluids from ocean vessel machinery, small releases of antifouling paint, interior paint, and exterior paint from vessels. Discharges of kitchen and septic wastes potentially contain treatment chemicals, soaps, solvents, pathogens, and nutrients and most likely represent a negligible to minimal contribution to contamination of water quality in the POCSR (Kaplan et al. 2010).

The largest contributors of hydrocarbons to offshore waters, however, are the naturally occurring oil seeps within the northwestern Santa Barbara Channel near Point Conception. The Santa Barbara Channel contains some of the most productive oil seeps in the world and may contribute 20,000 metric tons of crude oil into the marine environment per year (Kvenolden and Cooper 2003). Southerly winds and currents can carry hydrocarbons from seeps northward into the Santa Maria Basin (Lorenson et al. 2011). These seeps are known to often produce localized, visible sheens on the water and lead to the production of tar balls commonly found on beaches after weathering and oxidation of oil (Hostettler et al. 2004; Farwell et al. 2009).

Beached bird monitoring projects in California in the late 1970s found a substantially higher percentage of dead birds oiled in the Santa Barbara Channel than elsewhere (Stenzel et al. 1988; Henkel et al. 2014). Oiled Wildlife Care Network member organizations throughout California reported 1,472 live oiled birds from 2005 to 2010 that were not associated with any known spill. The annual mean number of birds reported was 245 (±141; all errors shown are SD), with a range of 107–482 (Henkel et al. 2014). Regionally, the number of live oiled birds reported was greatest in Santa Barbara County (69 per year, ±59). Given the geographic distribution of the oiling of live birds, it is assumed that most chronic oiling from 2005–2010 was from oil originating from seeps off southern California (Henkel et al. 2014).

Although we are aware of the presence of oil seeps in the action area and that birds historically may have occasionally been impacted, these incidents are rare and the current knowledge of the geology and understanding of reservoir characteristics in the SCPA are well advanced. Therefore, the likelihood of a naturally occurring oil seep to impact ESA-listed species would be low.

5 Rangewide Status of Species and Critical Habitat (CH)

This section considers the current baseline and status of the USFWS listed species and their CH (if any) are within the action area. To identify species, a list was developed based on geographic overlap with the action area (list generated by IPAC.gov in 2022). This section also examines the condition of the CH throughout the designated area and discusses the function of the physical or biological features (PBF)'s that are essential for the conservation of the species.

5.1 Southern Sea Otter

The southern sea otter (*Enhydra lutris nereis*) was listed as threatened on January 14, 1977 (42 FR 2968). The original recovery plan was finalized in 1982 (USFWS 1982). A revised recovery plan was finalized in 2003 (USFWS 2003). No CH has been identified for this species. The primary reasons for listing the southern sea otter were 1) small population size and limited distribution, and 2) the threat of oil spills, pollution, and competition with humans. The 2021 stock assessment report also identified threats from shark predation, fisheries bycatch, entanglement in marine debris, vessel collisions, climate change, contaminants, and carrying capacity limitations (USFWS 2021).

Southern sea otters occupy nearshore waters with rocky or sandy bottoms supporting large populations of benthic invertebrates (Riedman 1987) along the mainland coastline of California from San Mateo County to Santa Barbara County (Figure 4). In California, otters live in waters less than 18 m deep and rarely move more than 2 km offshore (Riedman 1987). A subpopulation of southern sea otters also exists at San Nicolas Island (SNI), Ventura County, located 90 km (61 mi) from the nearest point of the mainland as a result of translocation efforts initiated in 1987 and terminated in 2012 (77 FR 75266; December 19, 2012).

As recommended in the Final Revised Recovery Plan for the Southern Sea Otter (USFWS 2003), 3-year running averages are used to characterize trends to dampen the effects of anomalous counts in any given year. Based on 3-year running averages of the annual spring counts, the rangewide (combined mainland and SNI) population growth trend over the 5-year period from 2015 to 2019 was flat at 0.12% per year (Figure 5; Hatfield et al. 2019). In 2019, the range-wide index of the southern sea otter abundance was 2,962 with 2,863 along the mainland and 99 at SNI (Figure 5, Hatfield et al. 2019). Population counts were well below the candidate value proposed by Tinker et al. (2021) for California: 10,236.

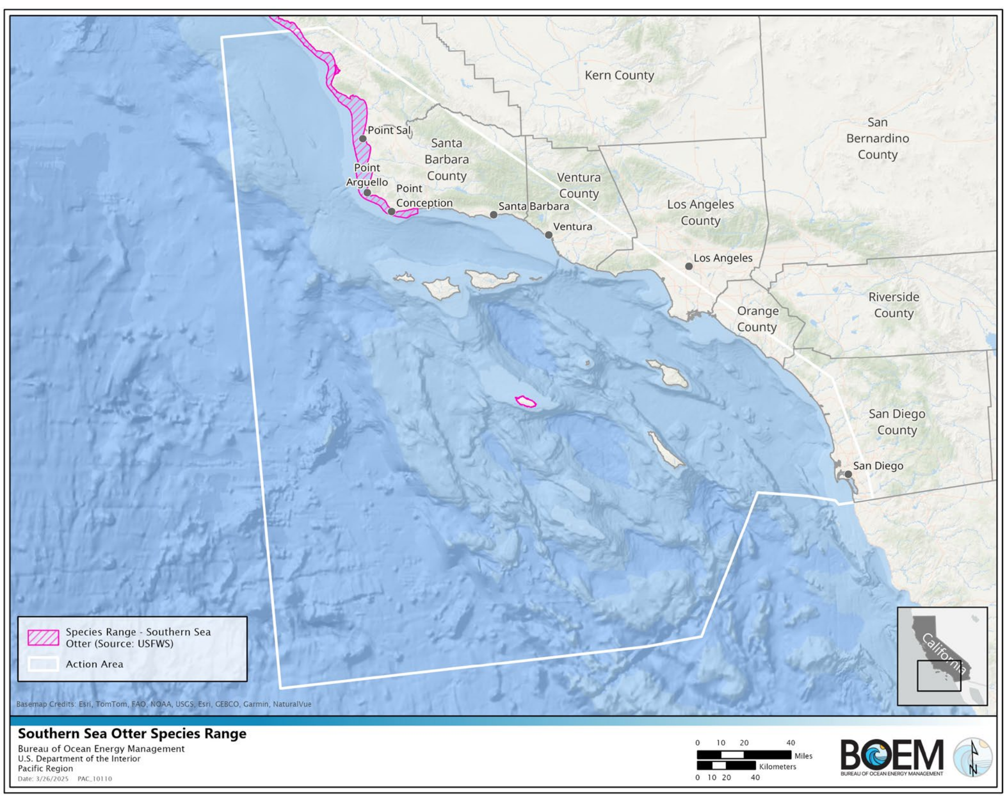

Figure 4. Southern portion of the southern sea otter species range relative to the action area.

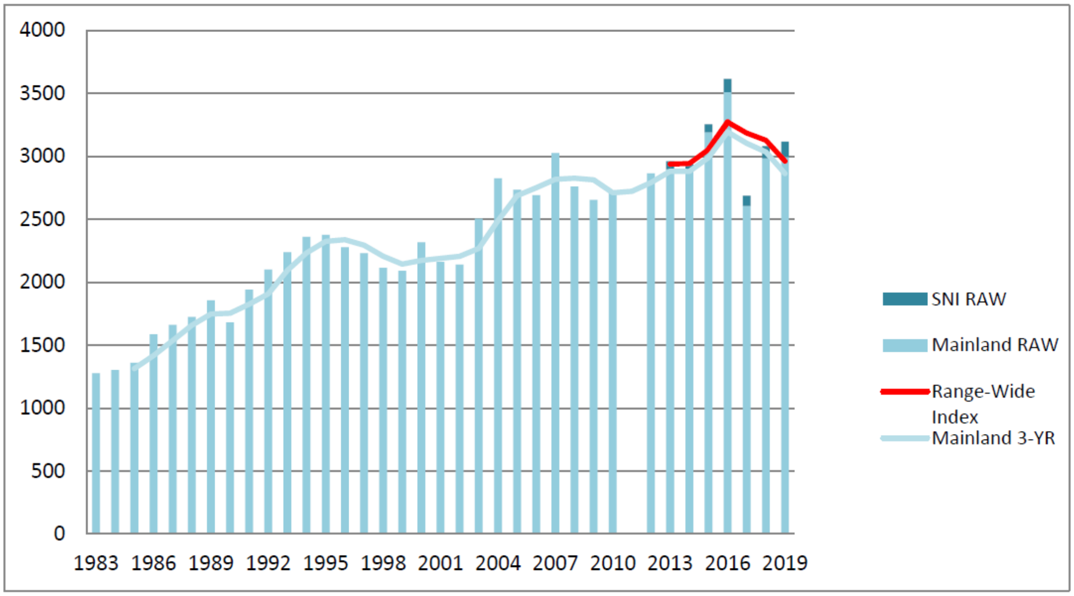

Figure 5. Southern sea otter counts (y-axis), 1983-2019 (Hatfield et al. 2019).
Bars show raw counts for each year, and lines represent 3-year running averages. The annual census was not completed in 2011 (due to weather) or 2020 (due to COVID-19 restrictions).
SNI = San Nicolas Island.

5.2 California Least Tern

The California Least Tern (*Sterna antillarum browni*) was listed as endangered on October 13, 1970 (35 FR 16047). The recovery plan for the species was published in 1980 (USFWS 1980b) and a revised recovery plan was later published in 1985 (USFWS 1985). CH has not been designated. The primary reasons for listing this taxon were loss of habitat, human disturbance, and predation. On October 2, 2006, the USFWS announced the completion of a 5-year review of the status of the California Least Tern, wherein they recommended it for downlisting from endangered to threatened (USFWS 2006a). However, a proposed rule to downlist the taxon has not been published to date, and the previously-increasing population trend was not sustained beyond 2008, so the status of the taxa remains endangered throughout its range. The latest 5-year review was published July 7, 2020. No change in listing status was recommended (USFWS 2020a).

The California Least Tern is a summer visitor to California that breeds on sandy beaches close to estuaries and embayments discontinuously along the California coast from San Francisco Bay south to San Diego County and south into Baja California. The earliest spring migrants arrive in the San Diego area after the first week in April and reach the greater San Francisco Bay area by late April (Small 1994). Nesting colonies are usually located on open expanses of sand, dirt, or dried mud, typically in areas with sparse or no vegetation. Colonies are also usually near a lagoon or estuary where they obtain most of the small fish they consume, although they may also forage up to 3-5 km (23 miles) offshore. Nests consist of a shallow scrape in the sand, sometimes surrounded by shell fragments. Eggs (usually two per clutch) are laid from mid-May to early August. Incubation takes 20-28 days, and young fledge in about 20 days (USFWS 1980b). Least Terns are faithful to breeding sites and return year after year regardless of past nesting success. In the Southern California Planning Area, California Least Terns breed along the coasts of San Luis Obispo, Santa Barbara, Ventura, Los Angeles, and Orange Counties from Oceano Dunes in San Luis Obispo County to the Tijuana River Estuary in San Diego County. Fall migration begins the last week of July and first week of August (USFWS 2006a) when the subspecies departs for its wintering grounds in Central and South America. Most individuals are gone from southern California by mid-September.

In 1970, when the California Least Tern was listed as endangered by the federal government and California, its population in California was estimated at 600 breeding pairs. Population growth rates have increased, especially since the mid-1980s, when active management was initiated at breeding colonies. Although the increase in the breeding population has not been consistent from year to year, the long-term trends have shown steady population growth. Population growth peaked between 2003-2009 when approximately 7,000 breeding pairs were nesting in California. The number of breeding pairs dropped in 2011, and numbers have stabilized at a lower level since that time with an average minimum breeding population of 3,294 pairs from 2018-2022. Fluctuations in the California Least Tern population are thought to be attributable to a combination of high levels of predation and low prey availability.

In the general area of the Southern California Planning Area, as many as 30sites were used for nesting by California Least Terns in 2022. Rangewide survey results from 2022 reported a minimum of 2,758 breeding pairs, maximum of 3,095 breeding pairs, and 3,431 nests in this region, which is approximately 83% of the nesting population and effort in California . Significant breeding areas within this stretch of coastline include Oceano Dunes, Vandenberg Air Force Base, McGrath State Beach, Hollywood Beach, Point Mugu, Venice Beach, Los Angeles Harbor, Seal Beach National Wildlife Refuge (NWR), Bolsa Chica Ecological Reserve, Huntington State Beach, Upper Newport Bay, Camp Pendleton, Batiquitos Lagoon, Mission Bay, Naval Base Coronado, Sweetwater Marsh NWR, and Tijuana River Estuary.

Studies conducted at some of the larger colonies in southern California show that at least 75% of all foraging activity during breeding occurs in the ocean (Atwood and Minsky 1983). Approximately 90-95% of ocean feeding occurred within 1 mile of shore in water depths of 60 feet or less. California Least Terns were rarely seen foraging at distances between 1-2 miles from shore and were never encountered farther than 2 miles offshore (Atwood and Minsky 1983). However, there is evidence of some foraging and migration off California that occurs as far as 20 miles offshore or more based on observations off southern California (Pereksta, pers obs.). Further evidence offshore Mexico possibly corroborates these observations (Howell and Engel 1993; Ryan and Kluza 1999).

5.3 Western Snowy Plover and CH

The Pacific Coast population of the Western Snowy Plover (*Charadrius nivosus nivosus*) was listed as threatened on March 5, 1993 (58 FR 12864). Primary reasons for listing were loss and degradation of habitat, and human disturbance. A final recovery plan was signed August 13, 2007. CH for the species was originally designated in 1999 (64 FR 68507), revised in 2005 (70 FR 56970) and revised again in 2012 (77 FR 36727).

The Pacific Coast population of the Western Snowy Plover breeds on the Pacific Coast from southern Washington to southern Baja California, Mexico. The bird is found on beaches, open mudflats, salt pans and alkaline flats, and sandy margins of rivers, lakes, and ponds. It nests in depressions in the sand above the drift zone on coastal beaches, sand spits, dune-backed beaches, sparsely vegetated dunes, beaches at creeks and river mouths, and salt pans at lagoons and estuaries. The breeding season extends from early March to late September, with birds at more southerly locations beginning to nest earlier in the season than birds at more northerly locations (64 FR 68507). In most years, the earliest nests on the California coast generally occur during the first to third week of March. Peak nesting in California occurs from mid-April to mid-June, while hatching lasts from early April through mid-August.

Snowy plover chicks are precocial, leaving the nest within hours after hatching to search for food. Adult plovers do not feed their chicks but lead them to suitable feeding areas. The chicks reach fledging age approximately one month after hatching; however, broods rarely remain in the nesting area throughout this time. Plover broods may travel along the beach as far as 6.4 kilometers (4 miles) from their natal area.

Snowy plovers are primarily visual foragers. They forage for invertebrates across sandy beaches from the swash zone to the macrophyte wrack line of the dry upper beach. They also forage in dry sandy areas above the high tide, on salt flats, and along the edges of salt marshes and salt ponds (58 FR 12864).

In winter, the taxon is found on many of the beaches used for nesting, as well as on beaches where they do not nest, in man-made salt ponds, and on estuarine sand and mud flats. The winter range is somewhat broader and may extend to Central America (Page et al. 1995). The majority of birds along the coast winter south of Bodega Bay, California (Page et al. 1986).

This species was formerly found on quiet beaches the length of the state, but it has declined in abundance and become discontinuous in its distribution. Habitat degradation caused by human disturbance, urban development, introduced beachgrass (*Ammophila* spp.), and expanding predator populations have led to declines in nesting areas and the size of breeding and wintering populations (USFWS 2007a). In the United States, Western Snowy Plover populations are indexed through twice-yearly window surveys (winter and breeding), in which plovers are counted at all sites across the coastal range of the subspecies. Winter window surveys are conducted in January and show larger Western Snowy Plover numbers because birds from the unlisted interior breeding population also overwinter on the coast (Page et al. 1995). Breeding window surveys are conducted in May and count the breeding population of Western Snowy Plovers. Breeding populations have increased since 2007 and have remained stable (USFWS 2024). The summer window survey conducted in 2024 found 2,676 birds throughout Washington, Oregon, and California.

In the Southern California Planning Area, Western Snowy Plovers breed or winter along the coasts of San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego Counties from San Carpoforo Creek in northern San Luis Obispo County to Border Field State Park in San Diego County. They also occur on several of the Channel Islands including San Miguel, Santa Rosa, Santa Cruz, San Nicolas, and San Clemente Islands. From 2020-2025, an average of 1,532 breeding adults occurred in this area, which is 64% of breeding adults in the range of the listed population. Significant breeding areas within this stretch of coast include the Morro Bay Sandspit, Oceano Dunes State Vehicular Recreation Area, the Guadalupe Dunes, Vandenberg Air Force Base beaches, Coal Oil Point, Ventura Beaches (McGrath, Mandalay, and Hollywood), Ormond Beach, Naval Base Ventura County, San Nicolas Island, the Bolsa Chica Ecological Reserve, and Camp Pendleton. The average number of wintering Western Snowy Plovers in this area from 2020-2024 was 3,396; approximately 74% of the wintering population along the Pacific coast.

A revised designation of critical habitat for the Western Snowy Plover (Figure 6) was published on June 19, 2012. This designation includes 60 units totaling 24,526 acres. Thirty-five of these units occur along the coast of the Southern California Planning Area, comprising 6,117 acres. This acreage is 25% of the total critical habitat designation.

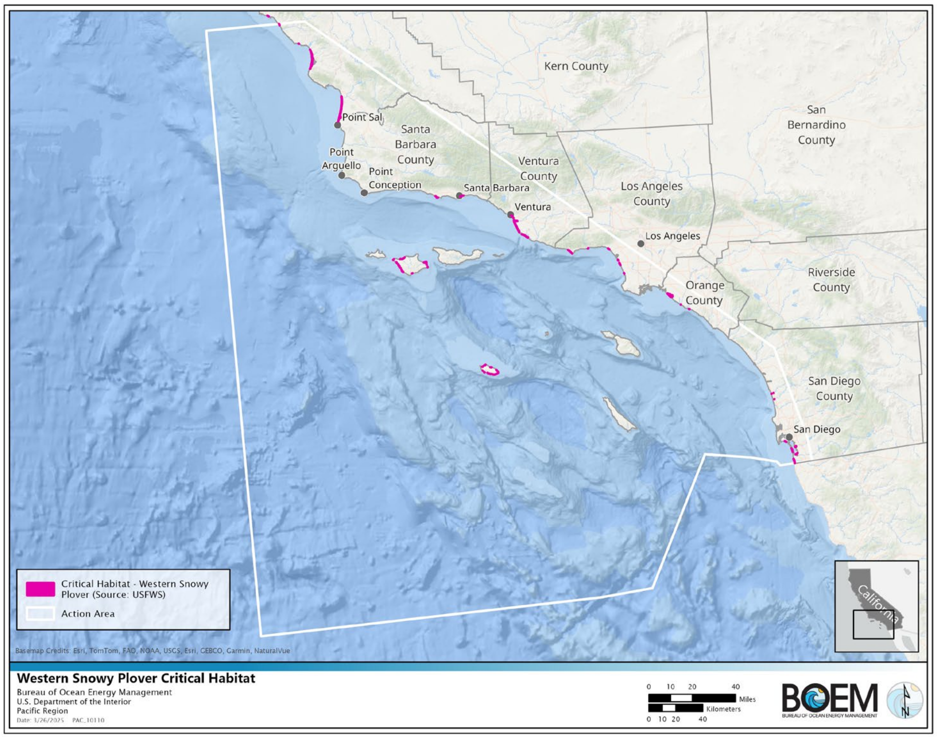

Figure 6. Western Snowy Plover critical habitat relative to the action area.

5.4 Light-footed Ridgway's Rail

The Light-footed Ridgway's Rail (*Rallus obsoletus levipes*) (formerly Light-footed Clapper Rail [*Rallus longirostris levipes*]) was listed as endangered on October 13, 1970 (35 FR 8320). A recovery plan was approved in 1979 (USFWS 1979) and amended in 2019 (USFWS 2019). CH has not been designated for this subspecies. Habitat loss and degradation were the primary reason for ESA listing.

Light-footed Ridgway's Rails inhabit coastal salt marshes from the Carpinteria Marsh in Santa Barbara County, California, to Bahia de San Quintin, Baja California, Mexico (Zembal et al. 1989, Zembal et al. 1998). The Light-footed Ridgway's Rail is normally found in estuarine habitats, particularly salt marshes with well-developed tidal channels. Dense growths of cordgrass (*Spartina foliosa*) and pickleweed (*Salicornia* sp.) are conspicuous components of rail habitat, and nests are located most frequently in cordgrass. Light-footed Ridgway's Rails construct loose nests of plant stems, either directly on the ground when in pickleweed or somewhat elevated when in cordgrass (USFWS 1979). Although nests are usually located in the higher portions of the marsh, they are buoyant and will float up with the tide. Eggs are laid from mid-March to the end of June, but most are laid from early April to early May. The incubation period is about 23 days, and young can swim soon after hatching.

In recent decades, Light-footed Ridgway's Rails have been consistently detected in only four marsh habitats across the range, all of which are in the two southernmost coastal counties (Orange and San Diego; Figure 7). Most breeding birds are found in Upper Newport Bay, Seal Beach, and the Tijuana Marsh. In most of the remaining marshes, rails are found intermittently, with populations "blinking" on and off over time (Zembal et al. 2017). Though smaller, these marsh habitats serve not only as stopover habitat for dispersal, but also as life-long territories for a smaller number of pairs. Historically, most of the salt marshes in this region were probably occupied by rails, with no more than 24 marshes occupied since about 1980 (Zembal and Hoffman 1999). Currently, Light-footed Ridgway's Rails are extant or presumed extant in various numbers at 19 surveyed marshes along the California coast.

The vast majority (more than 95%) of the remaining Light-footed Ridgway's Rails are in Orange and San Diego Counties. The California population of the Light-footed Ridgway's Rail dropped 142 breeding pairs from the all-time high of 656 pairs in 2016 to 514 pairs in 2017, then to 266 pairs in 19 wetlands in 2023 (Zembal et al. 2023). The 2019 count of 308 pairs was the lowest tallied since a population crash in 2008 and followed 6 consecutive years of population totals over 500 pairs. The status of the Light-footed Ridgway's Rail in Mexico is not well-documented, but it is believed that a large population of Light-footed Ridgway's Rails resides there.

In the general area of the Southern California Planning Area that could be impacted by oil spills, there are presently only two marshes that are, or have the potential to be, occupied by Light-footed Ridgway's Rails. These are Carpinteria Marsh in Santa Barbara County and Mugu Lagoon in Ventura County. The next closest occupied location is the Seal Beach NWR in Orange County. These locations represent the northern extent of the subspecies range along the California coast. The Light-footed Ridgway's Rail subpopulation at Mugu Lagoon fluctuated between 3 and 7 pairs for nearly 20 years until recent augmentations with translocated birds from Newport Bay fostered its growth. During 2010 through 2014 there was an average of 18 pairs and 5 unmated males in Mugu Lagoon on Naval Base Ventura County (Navy 2015). The increased population at this location appears to have led to an expansion of habitat use within the lagoon. For example, in 2004, a pair of rails was observed attempting to breed in the eastern arm of the lagoon for the first time in many years (Zembal et al. 2006). However, the population started to decline there in 2018 and only four pairs were present in 2022 and 2023 (Zembal et al. 2023). In Santa Barbara County, the taxon was formerly more widespread, but the loss of habitat and other factors restricted it to the Carpinteria Salt Marsh during the later 1900s (Lehman 2014). Approximately 20 pairs were there in the early 1980s dropping to just one individual by 2004. None were recorded after 2004 until a single individual was heard vocalizing there in 2011.

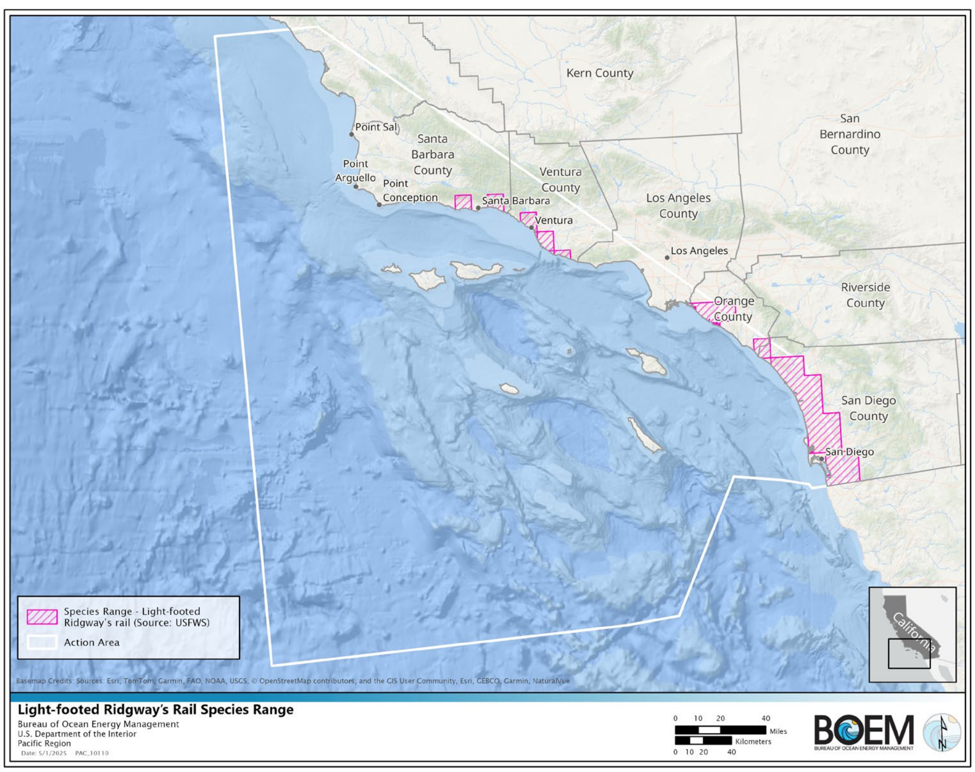

Figure 7. Light-footed Ridgway's Rail species range relative to the action area.

5.5 Marbled Murrelet

The Marbled Murrelet (*Brachyramphus marmoratus marmoratus*) (Figure 8) was federally listed as threatened on October 1, 1992, within the states of Washington, Oregon, and California (57 FR 45328). Populations in Alaska and British Columbia were not listed under the ESA.

The Marbled Murrelet is a small seabird that spends most of its life in the nearshore marine environment (within 5 km; Ainley et al. 1995), but nests and roosts inland in low-elevation old growth forests, or other forests with remnant large trees. CH for the species was designated on May 24, 1996 (61 FR 26256) and was later revised in a final rule published on October 5, 2011 (76 FR 61599). A final determination published on August 4, 2016 (81 FR 51348) determined that the CH for the Marbled Murrelet, as designated in 1996 and revised in 2011, meets the statutory definition of CH under the ESA. No marine areas were designated as CH and none of the terrestrial units are south of the Santa Cruz Mountains (the southern extent of known breeding along the Pacific coast).

While the species does not nest in the vicinity of the project area, individuals from the population nesting in the Santa Cruz Mountains (and perhaps from more northerly populations) do disperse to the coast and offshore waters of San Luis Obispo and Santa Barbara Counties. Marantz (1986) characterized them as a rare transient and winter visitant offshore, but possibly regular in late summer in San Luis Obispo County. Lehman (2014) described the species as a very rare late-summer, fall, and winter visitor along the coast of Santa Barbara County, but somewhat regular in late summer in the Point Sal/north Vandenberg Air Force Base area.

In a study where Marbled Murrelets nesting in the Santa Cruz Mountains were radiomarked (Peery et al. 2008), 3 of 46 birds (7%) radiomarked during the breeding season dispersed considerable distances (138-220 km) to the San Luis Obispo County coast. Nine of the 20 murrelets radiomarked in the postbreeding season dispersed long distances, 8 of which were relocated along the San Luis Obispo County coast after traveling 192-288 km. Their results indicate that the San Luis Obispo coast extending south to Point Sal in Santa Barbara County is an important wintering area for the species in central California (Peery et al. 2008).

A review of records in eBird (February 2015) shows observations along the coast from Arroyo de la Cruz in northern San Luis Obispo County to the Purisima Point area on Vandenberg Air Force Base. Areas with concentrations of Marbled Murrelet observations include San Simeon Bay, offshore of San Simeon State Park, Cayucos, Morro Bay, San Luis Obispo Bay, and off the Santa Maria River mouth. These records show peaks of occurrence along this stretch of coast in mid-January, May-early June, and mid-August-early November. Marbled Murrelets occur less frequently south of Point Conception; however, they are observed occasionally off Ventura, along the Malibu coastline, and in Santa Monica Bay.

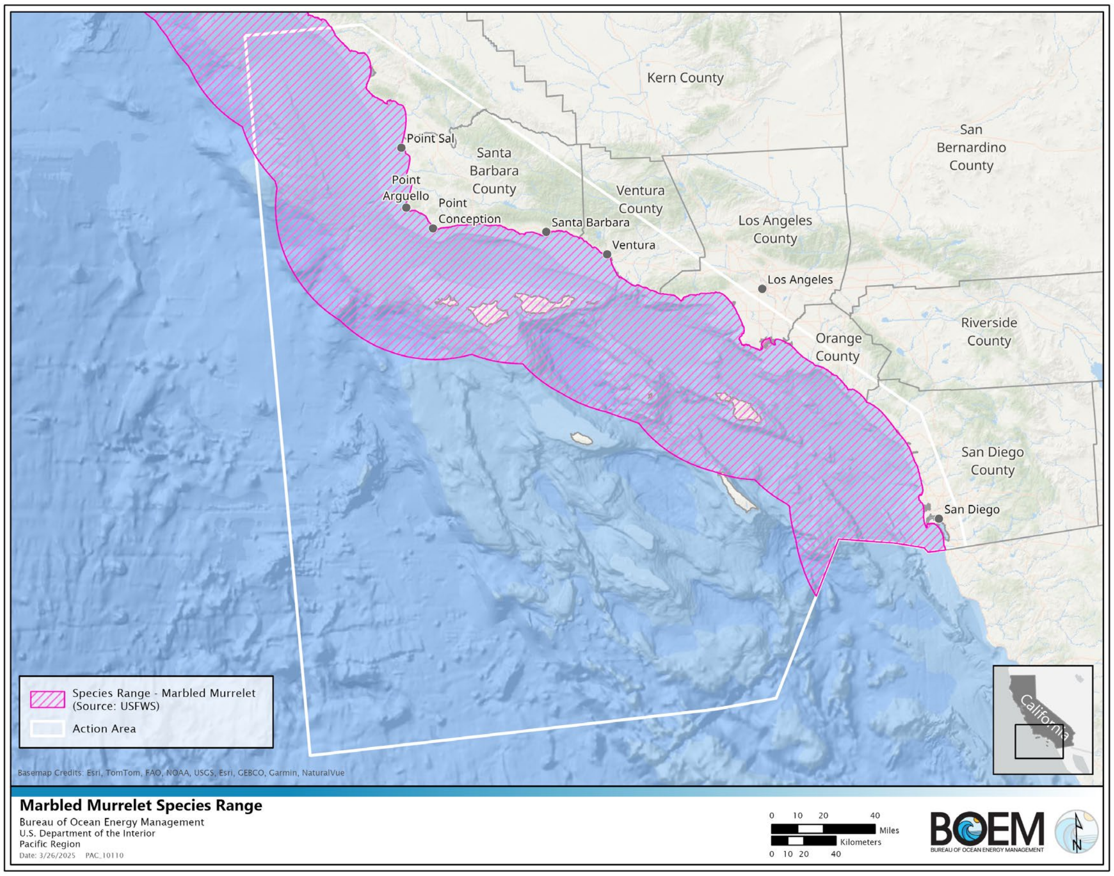

Figure 8. Marbled Murrelet species range relative to the action area.

5.6 Short-tailed Albatross

The Short-tailed Albatross (*Phoebastria albatrus*) was listed as endangered on June 2, 1970 (35 FR 8491). It is also a California species of special concern. This species is a large pelagic bird with long narrow wings adapted for soaring just above the water surface. As of 2020, 84% of the known breeding population uses a single colony, Tsubamezaki, on Torishima Island off Japan (USFWS 2020b). The majority of the remaining population nests on other islands surrounding Japan. During the non-breeding season, the Short-tailed Albatross regularly ranges along the Pacific Rim from southern Japan to the Gulf of Alaska, primarily along continental shelf margins. It is rare to casual but increasing offshore from British Columbia to southern California (Howell 2012). Most records along the West Coast have been stage 1 immatures (Howell 2012), which travel more broadly throughout the north Pacific than adults (USFWS 2020b). Most individuals found off California have been during the fall and early winter with a few records in late winter and early spring (California Birds Record Committee 2007). The diet of this species is not well studied; however, research suggests that squid, crustaceans, and fish are important prey while birds are at sea during the non-breeding season (USFWS 2008).

The global population was most recently estimated to be 7,365 birds (USFWS 2020b); population growth rate was estimated at 8.9% per year for a recent 3-year running average (USFWS 2020b).

There were 55 records of the species off California between 1977 and 2024 with 51 records between 1998 and 2024. Eleven of the 55 records were in the SCPA off the coast of San Luis Obispo and Santa Barbara Counties, and around and beyond the Channel Islands. Most individuals found off California have been during the fall and early winter with a few records in late winter and early spring (California Birds Record Committee 2007). Some of their known threats include fishing interactions (e.g., entanglement in longline fishing gear), environmental contaminants (e.g., toxic metals, pesticides, polychlorinated biphenyls), debris (ingestion of plastics), and oil spills. Although they have been documented in the action area, they are not known to be present in the action area on a regular basis.

5.7 Hawaiian Petrel

The Hawaiian Petrel (*Pterodroma sandwichensis*) was federally listed as endangered on March 11, 1967 (32 FR 4001). The species breeds on larger islands in the Hawaiian chain where they nest in burrows on vegetated cliffs, volcanic slopes, and lava flows. The global population was approximately 19,000 as of 1994 (USFWS 2011; Lebbin et al 2010) but an analysis of at-sea surveys conducted between 1998 and 2011 estimated the Hawaiian Petrel population to be 52,186 individuals (95% CI 39,823–67,379; Joyce et al. 2013).

The species is absent from Hawaiian waters from November-April when it disperses to the eastern tropical Pacific. Individuals have been recorded off of Oregon and California from April-October (Onley and Scofield 2007) with the California records occurring from April-early September. The first of California's 66 accepted records occurred in May 1992. Of the 66 accepted records, 12 occurred in the vicinity of the SCPA; 1 was nearshore and the other 11 were 24–100 mi offshore. Hawaiian Petrels with satellite transmitters have been tracked making regular foraging excursions to areas off northern California. The species is also now seen regularly from boats and repositioning cruise ships off California in the spring and summer (eBird 2025). Their threats are habitat loss due to land development and predation by mongooses, feral cats and dogs.

5.8 California Red-legged Frog and CH

The California red-legged frog (*Rana draytonii*) was federally listed as threatened on May 23, 1996 (61 FR 25813). A recovery plan for the species was finalized in 2002 (USFWS 2002). CH was designated in 2006 (71 FR 19244) and revised in 2010 (75 FR 12816)(Figure 9). A 5-year review was published in 2022 (USFWS 2022). The California red-legged frog has been extirpated from 70% of its former range and is threatened in its remaining range by human impacts, including urban encroachment, construction of reservoirs and water diversions, introduction of exotic predators and competitors, livestock grazing, and habitat fragmentation.

The California red-legged frog occupies a fairly distinct habitat, combining both specific aquatic and riparian components (Jennings and Hayes 1988; Jennings 1988). Adults require dense, shrubby or emergent riparian vegetation closely associated with deep (> 0.7 m) still or slow-moving water (Jennings and Hayes 1988). The largest densities of California red-legged frogs are associated with deepwater pools with dense stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha latifolia*) (Jennings 1988). Well-vegetated terrestrial areas within the riparian corridor may provide important sheltering habitat during winter. Adult frogs may be found seasonally in the coastal lagoons of the central California coast. They move upstream to freshwater when sand berms are breached by seawater from storms or high tides.

California red-legged frogs breed from November through March, with earlier breeding records occurring in southern localities (Storer 1925). Egg masses that contain about 2,000-5,000 eggs are typically attached to vertical emergent vegetation, such as bulrushes or cattails. California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Eggs hatch in 6-14 days (Jennings 1988). Larvae undergo metamorphosis 3.5 to 7 months after hatching (Storer 1925; Wright and Wright 1949).

Sheltering habitat for the California red-legged frog is potentially all aquatic and riparian areas within the range of the species and includes any landscape features that provide cover and moisture during the dry season within 300 feet of a riparian area. This could include boulders or rocks and organic debris such as downed trees or logs; industrial debris; and agricultural features, such as drains, watering troughs, spring boxes, abandoned sheds, or hayricks. Incised stream channels with portions narrower than 18 inches and depths greater than 18 inches may also provide sheltering habitat.

California red-legged frogs are sensitive to high salinity (USFWS 2002). When eggs are exposed to salinity levels greater than 4.5 parts per thousand, 100 percent mortality occurs, and larvae die when exposed to salinities greater than 7.5 parts per thousand (Jennings and Hayes 1990). Nussbaum et al. (1983) stated that early-stage northern red-legged frog *(R. a. aurora)* embryos were tolerant of temperatures only between 48 and 70 degrees Fahrenheit; both the lower and upper lethal temperatures are the most extreme known for any North American ranid frog. Reis (1999) found that water temperature in a coastal marsh was the most important of three variables in differentiating between sites with egg masses and sites without. Salinity was not as critical in differentiating between sites with egg masses and without; however, salinity levels of 6.5 ppt or less was an important predictor for the presence of California red-legged frog tadpoles.

California red-legged frogs are known to occur in 243 streams or drainages in 22 counties, primarily in the central coastal region of California. The term “drainage” is used to describe named streams, creeks, and tributaries from which California red-legged frogs have been observed. A single occurrence of California red-legged frog is sufficient to designate a drainage as occupied by or supporting California red-legged frogs. Monterey, San Luis Obispo, and Santa Barbara counties support the greatest number of currently occupied drainages. Historically the California red-legged frog was known to occur in 46 counties but is now extirpated from 24 of those counties (a 52-percent reduction in county occurrences).

There are five critical habitat units that include coastal areas that have a boundary with the coastline in the Southern California Planning Area (SLO-2, SLO-3, STB-4, STB-5, STB-6) and include watersheds that flow into the ocean or coastal lagoons (Figure 9). The physical and biological features essential to the conservation of the species (primary constituent elements) that are encompassed within these units include aquatic breeding habitat, aquatic non-breeding habitat, upland habitat, and dispersal habitat. The Piedras Blancas to Cayucos Creek Unit (SLO-2) is comprised of 82,673 acres along the coast in northwestern San Luis Obispo County, the Willow and Toro Creeks to San Luis Obispo Unit (SLO-3) is comprised of 116,517 acres near the coast in central San Luis Obispo County, the Jalama Creek Unit (STB-4) is comprised of 7,685 acres along the coast in southwestern Santa Barbara County south of the City of Lompoc, the Gaviota Creek Unit (STB-5) is comprised of 12,888 acres along the coast in southern Santa Barbara County, and the Arroyo Quemado to Refugio Creek Unit (STB-6) is comprised of 11,985 acres along the coast in southern Santa Barbara County (75 FR 12816).

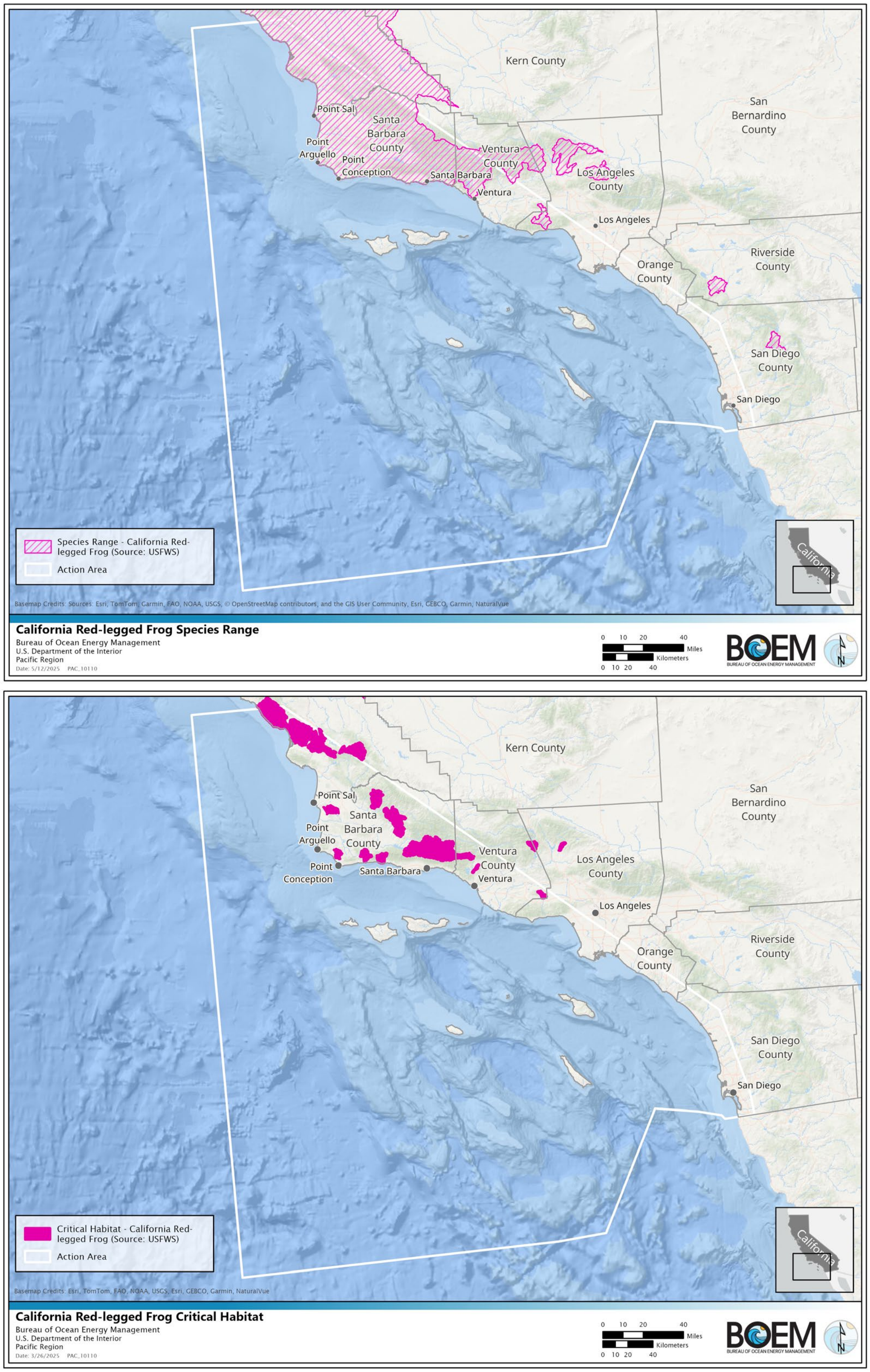

Figure 9. California red-legged frog species range (upper panel) and critical habitat (lower panel) relative to the action area.

5.9 Tidewater Goby and CH

The tidewater goby (*Eucyclogobius newberryi*) was listed by the USFWS as endangered on February 4, 1994 (59 FR 5498). On June 24, 1999, the USFWS published a proposed rule to remove the northern populations of the tidewater goby from the endangered species list; the proposed rule was withdrawn on November 7, 2002. A recovery plan for the species was completed on December 7, 2005 (USFWS 2005). USFWS has proposed reclassifying the species as threatened (USFWS 2014). CH for this species was designated on November 20, 2000 (65 FR 69693) revised on January 31, 2008 (73 FR 5920) and revised again on February 6, 2013 (78 FR 8746). Several estuarine rivers and lagoons in San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego Counties have been designated as critical habitat (USFWS 2013).

The tidewater goby is found only in California, on the coast from Del Norte County south to northern San Diego County. Tidewater gobies are typically found in shallow (< 1 m deep) brackish water in coastal wetlands, lagoons, and lower stream reaches (Lafferty et al. 1999; USFWS 2005). They are absent from areas where the coastline is steep and streams do not form lagoons or estuaries. Adults are benthic, and larvae are pelagic for less than 2 weeks (Love 1996; Spies 2014). The tidewater goby is threatened primarily by habitat loss from coastal development, channelization, diversions and alteration of water flows.

As of 2006, tidewater gobies were presumed present in 106 localities, with 64 of these sites in San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego Counties (USFWS 2007b). The action area contains the Central Coast, Conception, LA/Ventura, and South Coast Recovery Units, with population trends varying across these (USFWS 2005).

The action area contains all of the 34 CH units designated by the USFWS's 2013 critical habitat rule for the species (78 FR 8745; Figure 10). These units range from Arroyo de la Cruz near San Simeon (Unit SLO-1) to the San Luis Rey River near Oceanside (Unit SAN-1). These units contain all of the PBFs of designated CH of the species and comprise 14.3% of all CH for the species (1,732 of 12,156 total acres). The threats to CH within the action area are similar to the threats to all CH of the species: development, over drafting of water, channelization of habitat, and pollution. While there are no BOEM/BSEE regulated activities in these units, there is a potential for spilled oil to impact these areas under conditions that allow oil to enter any of these coastal lagoons.

Tidewater goby CH units have been designated along the coast adjacent to the SCPA including 12 units in San Luis Obispo County, 12 units in Santa Barbara County, 4 in Ventura County, 4 in Los Angeles County, 1 in Orange County, and 1 in San Diego County (Figure 10).

The PBF of the tidewater goby CH include the following:

- **PBF**: Persistent, shallow (in the range of approximately 0.3 to 6.6 feet (0.1 to 2 m)), still-to-slow-moving water in lagoons, estuaries, and coastal streams with salinity up to 12 ppt, which provide adequate space for normal behavior and individual and population growth that contain one or more of the following:
  a. Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction;
  b. Submerged and emergent aquatic vegetation, such as *Potamogeton pectinatus*, *Ruppia maritima*, *Typha latifola*, and *Scirpus* spp., that provides protection from predators and high flow events; or
  c. Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity.

CH includes areas outside the geographical area occupied at the time of listing that contain suitable aquatic habitat in coastal lagoons or estuaries, provide connectivity between source populations or may provide connectivity in the future, or may be more isolated but represent unique adaptations to local features (habitat variability, hydrology, microclimate). Overall, the CH for this species has remained stable but is still threatened by coastal development.

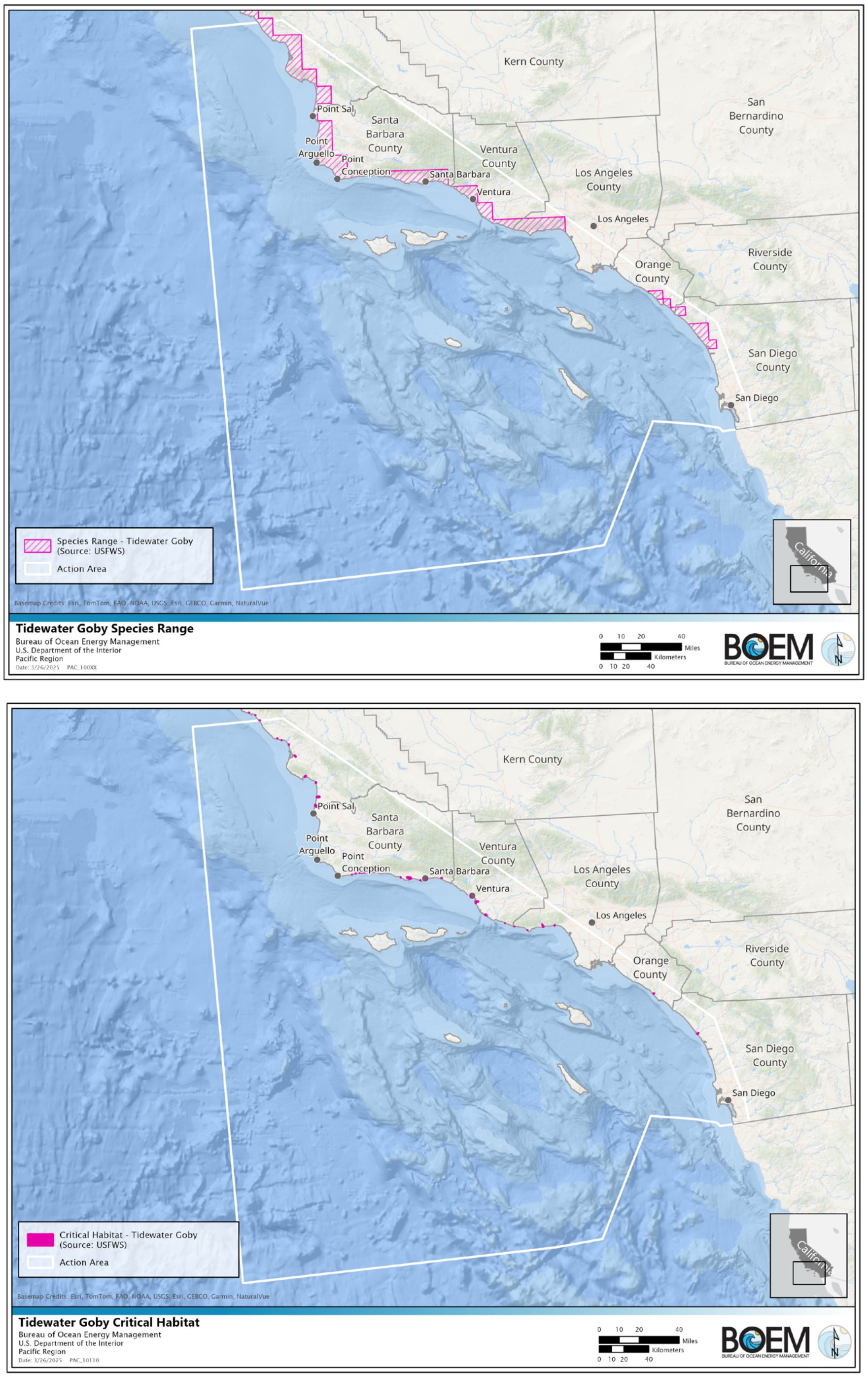

Figure 10. Tidewater goby species range (top) and CH (lower panel) in the action area.
CH:12 units in San Luis Obispo County, 12 units in Santa Barbara County, 4 in Ventura County, 4 in Los Angeles County, 1 in Orange County, and 1 in San Diego County

5.10 Salt Marsh Bird's Beak

The salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *maritimus*) was listed as an endangered plant on September 28, 1978 (43 FR 44812). A recovery plan for this species was approved in 2013. CH has not been designated.

It is a diffusely branched annual herb in the figwort family (Scrophulariaceae). These plants are hemiparasitic, sometimes obtaining moisture and nutrients from the roots of their host plants. This plant is generally restricted to coastal salt marshes where its primary habitat is the upper salt marsh above areas that receive daily salt flooding. Plants may also occur behind barrier dunes, on dunes, mounds, and occasionally in areas with no tidal influence.

This plant occurs in seven salt marshes from Morro Bay in San Luis Obispo County to San Diego County and Northern Baja California, Mexico. Destruction and modification of the coastal marshes is the primary reason for decline. Even minor alterations of the marsh that result in permanent changes in the natural tidal dynamics can make previously suitable habitat unsuitable. Changes in tidal inundation can make habitat unsuitable by: smothering plants with debris, encouraging other marsh vegetation which shades out plants, or decreasing germination of seeds (USFWS 1984).

The salt marsh bird's-beak is known to occur at four locations within the action area: Morro Bay, Carpinteria Salt Marsh, Point Mugu, and Upper Newport Bay. To date, some habitat protection and restoration work has occurred, and large-scale restoration planning is underway in areas such as Ormond Beach adjacent to Point Mugu; however, these actions only fulfill a small portion of the recovery goals identified for the species within the action area or rangewide. Threats to the species within the action area include encroachment by invasive non-native plants and trampling.

6 Effects of the Action on Species and Habitat

Under the ESA, "effects of the action" are all consequences to listed species or CH that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action (see 50 CFR 402.02). A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17).

6.1 Noise

Transportation, drilling and production activities typically produce multi-spectral sound that may be detected by endangered and threatened species. The source level of a sound produced by activities such as these is described as the amount of radiated sound at a particular frequency and distance, usually 1 m from the source, and is commonly expressed in dB re 1 μPa for underwater sound. Much of the following discussion is derived from the detailed review of the sounds produced by offshore activities in Richardson et al. (1995).

Exposure of marine animals to very loud noise can lead to the onset of temporary threshold shifts (TTS) or auditory injury. TTS is a temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individuals' hearing range above a previously established reference level (NMFS 2024a). Auditory injury refers to the damage to inner ear that can result in destruction of tissue, such as the loss of cochlear neuron synapses or auditory neuropathy (NMFS 2024a). NMFS (2024a) published an updated guidance on assessing effects of anthropogenic sound on marine mammal hearing, and hearing thresholds for sea otters (included with the guidance for Otariids) were also updated. Sea otter hearing range under water is 60 Hz–68 kHz and in air is 90 Hz–40 kHz.

The following recommended thresholds are used for predicting auditory injury for sea otters:

Sea otters (based on NMFS 2024a)

- Impulsive (underwater)
  - Lpk,flat: 230 dB
  - LE, ,24h: 185 dB
- Impulsive (in air)
  - Lpk,flat: 177 dB
  - LE, ,24h:163 dB
- Non-impulsive (underwater)
  - LE, ,24h: 199 dB
- Non-impulsive (in air)
  - LE, ,24h: 177 dB

Diving Birds: Underwater (SAIC 2011)

- Auditory injury threshold
  - 202 dB SEL
  - 206 dB_{PK}
  - 183 dB 24-hr cumulative SEL
- Non-auditory injury (barotrauma)
  - 208 dB SEL re: 1µPa2-sec

Behavioral reactions are assumed to reflect stress or cueing responses and result in take when they significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Multiple behavioral responses can overlap; for example, a flight response is likely to be coupled with cessation of feeding. Individuals of the same species may react differently to the same, or similar, stressor.

The following conservative thresholds are used as guidance for predicting TTS in sea otters (Table A.E-2; NMFS 2024a) and behavioral disturbance for birds from broadband sounds.[6] Sound pressure levels throughout this document are expressed in dB re: 1 μPa_{RMS} unless otherwise indicated[7]:Units for TTS values for marine mammals are represented as SEL thresholds in dB re 1 µPa2s underwater and dB re (20 µPa)2s in air.

Marine Mammals (sea otters) Underwater:

- Non-impulsive: 179
- Impulsive sound: 170

Marine Mammals (sea otters) In air:

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[6] Sound pressure is the sound force per unit micropascals (µPa), where 1 pascal (Pa) is the pressure resulting from a force of one newton exerted over an area of one square meter. Sound pressure level is expressed as the ratio of a measured sound pressure and a reference level. The commonly used reference pressure level in acoustics is 1 µPa, and the units for underwater sound pressure levels are decibels (dB) re 1 µPa.

[7] Root mean square (rms) is the square root of the arithmetic average of the squared instantaneous pressure values. Values in this document are expressed in RMS unless otherwise specified.

- Non-impulsive: 157
- Impulsive or continuous sound: 148

Diving Birds Underwater:

- Non-injurious TTS of 187 dB SEL TS (SAIC 2012)

Birds Airborne sound:

- 92 dB(A)$_{SEL}$ (Teachout 2015, USFWS)

The proposed action does not include sound levels that would cause TTS or auditory injury to listed species.

The following subsections describe the effects to listed species and CH from noise produced by ongoing O&G activities (e.g., drilling, vessel work, aircraft travel).

6.1.1 Sound from Drilling and Production

Production drilling may be conducted in the SCPA, but exploratory drilling is not a component of the proposed action. Noise produced by production activities on platforms is relatively weak, because a small surface area of a platform is actually in contact with the water and because machinery is placed on decks well above the water line (Richardson et al. 1995). Gales (1982) found that sounds from production activities on platforms were low frequency (about 4.5–38 Hz measured at 9–61 m), with the strongest received tones (119–127 dB) only about 5 Hz. The highest frequencies recorded were about 1.2 kHz. NMFS (2020) reported source levels for drilling from platforms up to 137 dB at 405 m and estimated this to equal 185 dB at the source (167–192 dB$_{PK}$).

Noise production levels and characteristics depend on whether a drilling unit is fixed to the sea floor. Drilling from a fixed production platform is quieter than from modules that rely on positioning thrusters, which produce additional underwater noise from propeller cavitation (Spence 2007). See Serintel SRL (2021) for a description of types of offshore drilling rigs. Nedwell and Edwards (2004) measured noise levels for a semisubmersible drill rig with thrusters operating and found a 20+ dB increase between 1 and 1,000 Hz compared to production only activities.

Underwater broadcasts (playbacks) of drillship, semi-submersible, and production platform sounds to sea otters did not result in detectable changes in sea otter behavior or use of the area (Riedman 1983; 1984). Although sea otters at the surface were probably receiving little or no underwater noise, some otters continued to dive and feed below the surface during the playbacks. At 1.2 km, the received sound levels of the strongest sounds were usually at least 10 dB above the ambient noise level (Malme et al. 1983; 1984).

Medium to large construction equipment (crane, large pumps, and generators) used occasionally throughout offshore facilities would emit noise of approximately 73 to 84-dB at 50 ft. While this approaches the 90-dB level that resource agencies consider potentially significant for many bird species, noise associated with temporary construction activities on platforms are localized and not expected to interfere with birds above the water.

Although drilling sound may contribute to a localized increase in ambient sound levels, it will not produce sound levels over great enough distances to cause disturbance. Due to the stationary and localized effects of platform-associated sounds, animals would encounter platform sounds only briefly as they swim by, and potential effects of disturbance are temporary and insignificant. Any bird approaching the platform would be fully aware of its presence before approaching close enough to experience harassment.

Noise resulting from operation of construction equipment below surface will result in an increase in underwater noise levels, and these temporary increases could result in significant sound pressure levels. However, noise-generating activities associated with the proposed action would originate more than 11 km (7 mi) offshore which is an unlikely location for sea otters to be present and for birds, if present, impacts would be expected to be temporary and insignificant. Thus, sound produced by drilling and production **may affect, but not likely to adversely affect** ESA-listed species.

6.1.2 Sound from Well Conductor Removal (Mechanical Cutting)

In 2021, 55 conductors were removed from three oil platforms off southern California. The conductors were cut 6 to 8 m (20 to 25 ft) below the mudline and the cutter revolutions per minute ranged from 60 to 72 RPM. BOEM consulted with NMFS prior to project approval, focusing on sound as the primary potential impact. Based on the best available information, NMFS concurred with BOEM's finding that the conductor removal was **not likely to adversely affect** listed species.

A study to collect empirical source level data during the cutting of wellbores and empty conductors found that the duration of cuts depended on the number of casing strings that needed to be cut (Fowler et al. 2022). Wellbores containing more casing strings took much longer to cut compared to the conductors that were empty. The broadband sound pressure levels (SPLs) generated by cutting either wellbore or empty conductors produced similar levels and, based on the spectrums observed, consisted of maximum broadband levels of approximately 150 dB re 1 µPa-m for frequencies of 500–1,000 Hz and 155 dB re 1 µPa-m for the band of 25–3,000 Hz.

Since the cutting occurred below the mudline and the conductors themselves acted at least partially as sound radiators, transmission loss was complex, but an examination of the received levels from multiple receivers indicates that a 15 Log(range) approximation was reasonable. During the field survey ambient sound levels were typically found to be in the 110 to 122 dB RMS SPL range for a broadband frequency band of approximately 25–3,000 Hz, with short periods (tens of minutes) where the ambient noise levels rose to 125 dB as local shipping passed near the survey. Thus, the distance to the marine mammal behavioral threshold for continuous sound of 120 dB is 205 m. However, marine mammals would have to remain in the ensonification zone (i.e., within 205 m of the structure) for a protracted period of time in order to experience the cutting sound levels, while simultaneously being exposed to ambient noise which would likely be masking the cutting noise. This masking would effectively reduce the ensonified radius. The overall result is that it is highly unlikely that a marine mammal (e.g., sea otters) would remain within the Level B radius for long and that Level B impacts are not likely to occur.

Airborne noise produced from well conductor removal activities could also affect birds. Birds on the water surface, perched on the platform or flying in the vicinity of the platform may be harassed, depending on their distance from the activities. If noise levels reach certain thresholds, it is expected that most birds will leave the area before any injury occurs. Based on an analysis conducted by the USFWS that assessed the potential for noise effects to Marbled Murrelets in terrestrial habitats, virtually all birds (any species) are harassed by sounds at a level of 82db and are flushed by sounds ≥92dB. In addition, sounds 15dB above the ambient background have been defined as a minimum sound threshold that could result in harassment to birds. A 15-dB increase represents a 34-fold increase of sound energy and is interpreted by humans as roughly "three times as loud." Although there is potential for birds to be impacted by the noise associated with well conductor removal, the action area is not near any marine bird breeding colonies where nesting birds could suffer greater noise-related effects than those foraging or transiting through any project area near the platforms. Therefore, noise impacts associated with well conductor removal to listed bird species are expected to be discountable.

Mechanical cutting activities associated with O&G platform conductor removal produces underwater sound pressure levels that contribute to the existing underwater ambient acoustic environment; however, sound pressure levels are well below the marine mammal onset for permanent threshold shift and generally lower for marine mammal temporary threshold shift onset (Fowler et al. 2022). Moreover, the action area is not near any marine bird breeding colonies where nesting birds could suffer greater noise-related effects than those foraging or transiting through any project area near the platforms. Therefore, sound produced during conductor removal **may affect but is not likely to adversely affect** ESA-listed species.

6.1.3 Vessel Sound

Crew and supply boats are used daily to transport personnel and supplies to platforms offshore southern California. Platform supply vessels range from 160 to 330 ft (50 to 100 m) in length and provide logistic support and transportation of goods, tools, equipment and personnel to and from offshore oil platforms and other offshore structures. Crew vessels are often between 24 and 60 m and ferry crew members to and from platforms.

With regards to effects to sea otters, their hearing is less sensitive than in other amphibious marine carnivores such as seals and sea lions (Reichmuth et al. 2013). Additionally, exposure and response to vessel noise and activities depend primarily on how close in proximity the vessel is to an individual animal. Brief interruptions in sheltering or communication via masking are possible, but unlikely given the ability of sea otters to move away from vessel disturbances and to quickly resume normal behaviors. Garshelis (1987) reported that sea otters in southern Alaska tend to avoid areas with frequent boat traffic. Additionally, the vessel traffic corridors within the action area are generally offshore which is not the area most sea otters are located. Since the sea otters typically reside within 1.2 miles of shore and the vessel sound associated with the proposed action would be at least 3 miles offshore, impacts from vessel sound related to O&G operations to sea otters is expected to be extremely unlikely (i.e., discountable).

With regards to effects to birds, noise produced from transiting vessels may exceed the threshold of potential effect for most birds, resulting in the potential for a flight response. However, vessel noise at a specific location is transitory; slowly increasing as a vessel approaches and decreasing as it passes. Because of the transitory nature of this noise and the mobility of marine birds it is unlikely that a marine bird would suffer an injury or death from vessel noise. In addition, no potential project area would be near any marine bird breeding colonies where nesting birds could suffer greater noise-related effects than those foraging or transiting through any project area near the platforms. Moreover, it is expected that the visual presence of the vessels will most likely elicit a response to move/fly away from the vessels before noise does (USFWS 2006b). Thus, although vessel noise may elicit some response to birds, it is expected that impacts from vessel sound related to O&G operations would be temporary and insignificant.

Tidewater gobies are unlikely to be exposed to vessel sound because most of the vessel activities associated with the proposed action will be three miles offshore and the habitat of the tidewater gobies located in brackish water coast lagoons, estuaries, and marshes do not overlap with the majority of the proposed action.

Moreover, BOEM expects that the O&G vessels will not substantially add to the local noise environment in their operating area due to the vessel size, propulsion, and other noise characteristics of typical support vessel machinery. The limited amount of project-related vessel traffic relative to existing vessel traffic in the Santa Barbara Channel area would contribute a negligible amount to the overall noise levels in the area. Therefore, vessel noise could result, at most, in a localized minor and temporary impact. Any contribution is likely small in the overall environment of regional ambient sound levels. A vessel’s transit past an individual animal will be brief and is not likely to impact any individual’s ability to feed, reproduce, or avoid predators. Vessel noise related to ongoing O&G activity in the POCSR **may affect but not likely to adversely affect** ESA-listed species.

6.1.4 Aircraft (Helicopter) Sound

Other than vessels, helicopters are an alternative means of crew transport on and off platforms in the POCSR. Helicopter noise has the potential to propagate underwater at levels that could be detected by marine animals (e.g., sea otters) and birds. Air-to-water transmission depends on 1) the receiver depth, and 2) the altitude, aspect, and strength of the source (Richardson et al. 1995). The angle of incidence at the water surface, water depth, and bottom conditions also strongly influence the propagation and levels of underwater sound from passing aircraft; propagation is attenuated in shallow water, especially when the bottom is reflective (Richardson et al. 1995). Richardson et al. (1995) presented an estimated source level for a Bell 212 helicopter of about 150 dB at altitudes of 150–600 m, with the dominant frequency a 22-Hz tone with harmonics. The rotors are the primary sources of sound from helicopters (Richardson et al. 1995). Duration is variable. For example, a Bell 214 was audible in air for 4 minutes before passing, for 38 seconds at 3-m (9-ft) depth, and for 11 seconds at 18 m (59 ft).

Further, helicopter noise at a specific location is transitory, slowly increasing as a vessel approaches and decreasing as it passes. Because of the transitory nature of this noise and the mobility of marine birds, it is unlikely that a marine bird would suffer an injury or death from helicopter noise. In addition, it is expected that the visual presence of the helicopters will only elicit a temporary response from birds in the area before noise does (USFWS 2006b).

As for sea otters, no systematic studies have been made of the reaction of sea otters to aircraft and helicopters (Richardson et al. 1995). During aerial surveys of the southern sea otter range conducted at an altitude of about 90 m (Bonnell et al. 1983), no reactions to the two-engine survey aircraft were observed. The helicopter trips supporting the SCPA will all be out of the Santa Barbara, Lompoc, and Santa Maria airports are expected to pass to the south of the main southern sea otter range. However, since no responses of sea otters were observed from the two-engine survey aircraft, we expected that impacts from noise associated with the helicopter traffic are expected to be discountable to southern sea otters.

Aircraft traffic may travel over occupied habitat of tidewater gobies when traveling to and from platforms; however, any effect on tidewater gobies is expected to be temporary and insignificant because aircraft traffic noise and other sources of noise would be indistinguishable and would be similar to the baseline conditions.

Routine OCS helicopter traffic would not be expected to disturb animals for extended periods. Helicopters, while flying offshore, generally maintain altitudes above 213 m (700 ft) during transit to and from a working area, and at an altitude of about 152 m (500 ft) between platforms. The duration of the helicopter activity is expected to be short-term, and the resulting potential effects will be also be temporary and insignificant. Therefore, impacts from helicopter flights **may affect but not likely to adversely affect** ESA-listed species.

6.2 Vessel Collision

Two types of boats transport personnel and supplies to platforms: platform supply vessels and crew vessels. Platform supply vessels range in length from 160 to 330 ft (50 to 100 m) and provide logistic support and transportation of goods, tools, equipment, and personnel to and from offshore oil platforms and other offshore structures. Crew vessels are often 15 m (50 ft) in length and are capable of travel at speeds of 25 kn and ferry crew members to and from platforms. Vessel trips to each platform group occur almost daily, ranging from an estimated 26 roundtrips/mo (from the city of Goleta to Santa Ynez Unit platforms) to 134 roundtrips/mo (from Port of Los Angeles to Beta Unit platforms) (Table 4).

Support vessels for activities in the Santa Barbara Channel and Santa Maria Basin operate out of bases in the Santa Barbara Channel. Support vessels traveling to and from the four platforms in San Pedro Bay operate out of Long Beach. Support vessels for O&G operations in SCPA, including both crew and supply boats, have averaged approximately 16 trips per week per platform (Bornholdt and Lear 1995; 1997). However, actual vessel traffic in the region varies among units. The Point Arguello platforms average as few as six supply trips per month, while crew and supply boat trips in the eastern Santa Barbara Channel are more frequent. The SCPA contains large ports and marinas that support numerous and diverse vessels.

Table 4. Estimated numbers of operator vessel trips per month to groups of platforms.

Platforms or groups of platforms visited	Departure location from shore	Estimated # trips per month
Heritage, Hondo, Harmony (Santa Ynez Unit)	Goleta	26
A, B, C, Hillhouse, Habitat, Henry	Santa Barbara	87
A, B, C, Hillhouse, Habitat, Henry	Port Hueneme	30
Gina, Gilda	Port Hueneme	87
Hogan, Houchin	Carpinteria	43
Gail, Grace	Carpinteria	43
Edith, Ellen, Elly (Beta Unit)	Port of Los Angles	134

The risk of collisions is reduced through O&G industry use of established travel corridors. O&G vessels will generally transit to the work location and remain in the area until work is complete, which decreases the potential for vessel strikes. The Santa Barbara Channel/Santa Maria Basin Oil Service Vessel Traffic Corridor Program is intended to minimize interactions between O&G operations and reduce potential for wildlife strikes. It was developed cooperatively by the two industries through the Joint Oil/Fisheries Liaison Office. In addition to providing transit corridors in and out of area ports, the program routes support traffic along the channel seaward of an outer boundary line. East of Gaviota, the outer boundary is defined by the 30-fathom line; west of Gaviota, and north of Point Conception as far as Pedernales Point, it follows the 50-fathom line. In the area west of Gaviota, the 50-fathom line is 4 km (2 nm) or more offshore. Additionally, all project related crews are provided the approved OCS operations training program which includes information regarding marine mammal species present in the area.

Vessel collisions represent a key hazard to marine mammals (Byrnes and Dunn 2020). Although collisions most frequently involve larger marine mammals, smaller species have also been reported. For example, USFWS (2021) documented that boat strikes typically cause several deaths of southern sea otters each year. In 2015-2019, total of 12 sea otters were struck by boats. Sea otters in southern Alaska tend to avoid areas with frequent boat traffic and will reoccupy those areas at times with less traffic (Garshelis and Garshelis 1984). Additionally, the vessel traffic corridors within the action area are generally offshore which is not the area most sea otters are located. Furthermore, The Port of Long Beach, Draft Master Plan Air Emission Inventory (Starcrest Consulting Group 2020) states that 7,000 vessel transits occur annually amounting to 19 transits per day. The number of vessel trips for ongoing operations compared to overall vessel transits in the area, as well as the fact that there have been no reports of vessel strikes of marine mammals related to offshore O&G operations over the last 30+ years, suggests that the likelihood that sea otters would be struck as a result of vessel activity associated with ongoing operations is extremely low and discountable.

As discussed above in section 3.10.3, we are adopting vessel speed restrictions and PSOs as part of the proposed action of conductor removals. As ongoing O&G operations will employ a relatively low number of work vessels and barges traveling along a limited number of routes between ports and the platforms, considering the nearshore location of the sea otters as well as the mitigations measures in place for marine birds and mammals, vessels for O&G operations **may affect but are not likely to adversely affect** ESA-listed species.

6.3 Authorized Liquid Waste Discharges

Produced water discharges from offshore O&G development activities, including discharges that may contain well stimulation treatment chemicals, may affect listed species through direct contact or ingestion of contaminated food. The Bureaus prepared an environmental assessment of the occasional use of well stimulation treatments in the Pacific Region, and we incorporate that analysis by reference (Argonne 2016).

The Clean Water Act (CWA) protects water resources in the United States. Section 402 of the CWA authorizes the EPA to issue NPDES permits to regulate the discharges of pollutants to waters of the United States, the territorial sea, contiguous zone, and ocean. Discharges are regulated to maintain levels that will not cause exceedance of water quality criteria established under the CWA (EPA 1976) as updated in 2003, based on revised EPA guidance (EPA 2002).

EPA regulates discharges from offshore O&G exploration, development, and production facilities in Federal waters off the southern California coast under an NPDES General Permit (as described in section 3.2.1). The General Permit issued by EPA regulates 22 identified discharges from O&G facilities, including drilling fluids and cuttings, produced water, well treatment, completion, and workover fluids, deck drainage, domestic and sanitary wastes, and miscellaneous routine discharges. The General Permit sets forth effluent limitations and monitoring and reporting requirements, including pollutant monitoring and toxicity testing of effluents. The point of compliance for effluents is the edge of the mixing zone, which extends laterally 100 m (328 ft) in all directions from the discharge point and vertically from the ocean surface to the seabed. Calculated concentrations of the constituents must meet the permit limits at the edge of the mixing zone, after accounting for dilution. The permit covers all 23 platforms (22 production and one processing) in the SCPA. All ocean discharges are tracked through quarterly discharge monitoring reports required by the NPDES permits (Kaplan et al. 2010).

Other discharges are regulated by the U.S. Coast Guard (USCG) or State of California. The USCG regulates vessel discharges, and the State of California regulates ocean discharges into State waters that extend 3 nmi from the coast under the California Ocean Plan, (California EPA 2012). This plan includes effluent limitations for 84 pollutants, which apply to any facility which discharges into State waters (AEG 2005). Oil platforms in State waters do not discharge into the ocean.

Volumes of drill cuttings and muds reflect the level of well drilling in a given year and a declining trend overall. Steinberger et al. (2004) reviewed NPDES discharge monitoring reports for the platforms operating in POCSR waters to quantify discharges to the Southern California Bight. Lyon and Stein (2010) performed a similar review of platform discharges for 2005. presents a comparison of major discharges by platform group for 1996, 2000, and 2005 drawn from these two studies, the most recent available compilations of such data.

From drilling operations, POCSR oil platforms discharged 12,127 metric tons in 1996, 2,956 in 2000, and 2,314 metric tons in 2005 of drill cuttings. Drilling mud discharge volumes followed a similar pattern. In 1996, platform operators drilled 31 new wells on the POCSR, but only 13 new wells in 2000. Platforms discharging drilling fluids and cuttings dropped from six in 2000 to 4 in 2005 (Lyon and Stein 2010). As of December 31, 2022, lessees have drilled a total of 370 exploration wells and 1,266 development wells, or 1,636 wells in all, on the POCSR. Based on data from 1996, 2000, and 2005, the vast majority of drilling waste discharges in the selected years occurred in the Santa Barbara Basin where the majority of platforms lie.

Operators treat produced water to separate oil and other impurities prior to discharge under the NPDES permit or reinjection below the seafloor. Treatment methods include the use of heat, corrugated plate coalescers, electrostatic precipitation, bubbling, and chemical treatment. After treatment, the remaining produced water is mostly brine, but may include trace metals and dissolved hydrocarbons, including benzene, toluene, ethylbenzene, and xylene. Dissolved metals may include arsenic, barium, chromium, cadmium, copper, zinc, mercury, lead, and nickel. Inorganic constituents may include cyanides and sulfides (Kaplan et al. 2010). Table 5 lists “end of the pipe” concentrations of chemical constituents measured in produced water samples (MRS 2005).

Table 5. Comparison of volumes of platform discharges for years 1996, 2000, and 2005.
Discharge volumes in millions of liters (L x 106)
Data for 1996 and 2000 from Steinberger et al. (2004); data for 2005 from Lyon and Stein (2010).

Discharge Type and Year	Santa Maria Basin (4 Platforms)	Santa Barbara Channel Basin (15 Platforms)	San Pedro Bay Basin (4 Platforms)	Totals for all Basins (23 Platforms)
Produced Water				
1996	1,689	3,638	47.0	5,374
2000	1,092	4,512	9.4	5,613
2005	4,264	5,153	30.7	9,448
Drilling Muds				
1996	2.10	45.10	6.9	54.1
2000	1.81	8.85	-	10.7
2005	2.43	4.59	-	7.0
Drill Cuttings (in Metric Tons)				
1996	114	10,466	1,547	12,127
2000	250	2,706	-	2,956
2005	475	1,839	-	2,314
Cooling Water				
1996	399	39,560	6,092	46,051
2000	-	34,272	4,778	39,050
2005	21,442	37,697	367	59,506

For direct impact from discharges, a variety of accidents could occur during use of well stimulation treatments on the OCS that could potentially affect marine wildlife. These are associated primarily with accidental releases of well stimulation treatment chemicals and fluids, and crude oil. Impacts from an accident depend on the magnitude, frequency, location, and timing of the accident; characteristics of the spilled material; spill-response capabilities and timing; and various meteorological and hydrological factors. Impacts could include decreased health, reproductive fitness, and longevity; increased vulnerability to disease; and increased mortality. A spill could also lead to the localized reduction, disappearance, or contamination of prey species. Most accidental releases limited to well stimulation treatment -related chemicals and produced water would quickly dissipate and would only affect a small amount of habitat and relatively few individuals and only for a short time after the release.

Birds may be indirectly affected if discharges containing well stimulation-related chemicals contaminate or reduce abundance of their prey. However, discharged fluids are highly diluted in the ocean, and concentrations of trace metals and hydrocarbons in the tissues of fishes around production platforms are within background levels (CSA 1997). Acute or chronic effects of produced water discharges on fish species have not been observed. Furthermore, ESA-listed birds spend little to no time near platforms. Thus, **food chain uptake is not expected to be a major exposure pathway for birds at offshore facilities where well stimulation treatments are used.**

Birds may also be affected by the proposed action involving gaseous, liquid, and solid discharges associated with day-to-day production activities or fluids associated with well completion and workover operations. They may fly over close to the discharged areas, but due to the implementation of the NPDES discharge permit and the rapid dilution of any discharges from releases on or near the platforms, we determine that contaminants from effluent discharges associated with activities including well stimulation related discharges should not be measurable in habitats relevant to the ESA-listed birds. Thus, **impacts to ESA-listed birds from discharges related to O&G operations is expected to be discountable.**

Adult California red-legged frogs inhabit brackish coastal lagoons formed seasonally behind sand berms that close the mouths of rivers and streams along the Central Coast of California. The California red-legged frog breeds in lagoons where salinity and water temperature levels are within suitable levels for egg and tadpole development. Storms or tides may breach these natural berms, at which point the frogs move upstream to freshwater. However, due to NPDES discharge permit requirements and the rapid dilution of the discharges, contaminants from effluent discharges associated with OCS activities including well stimulation-related discharges would not be measurable in the coastal waters and sediments that enter these lagoons. Thus, **impacts from discharges related to O&G operations to the California red-legged frogs are expected to be insignificant.**

Tidewater gobies are found in shallow coastal lagoons, stream mouths, and shallow areas of bays which are far from any of the source of potential areas of effluent discharges associated with OCS activities. Additionally, NPDES discharge permit requirements are implemented and the rapid dilution of the discharges from releases near the platforms, contaminants from effluent discharges associated with OCS activities including well stimulation-related discharges would not be measurable in the coastal waters and sediments that enter these lagoons. Thus, **impacting the tidewater gobies from discharges related to O&G operations would be extremely unlikely (i.e., discountable)**.

The proposed authorizations may contaminate **sea otter habitat** with gaseous, liquid, and solid discharges associated with day-to-day production activities or fluids associated with well completion and workover operations. However, the likelihood of such discharges and fluids exposing sea otter habitat or sea otter prey is extremely low because southern sea otters typically reside within 1.2 miles of shore and the project facilities are at least 3 miles offshore. Additionally, BOEM expects any contamination from fluids to be rapidly diluted by mixing with ocean water (BOEM 2019). Thus, **impacts from discharges related to O&G operations to sea otters and their habitat is expected to be extremely unlikely (i.e., discountable)**.

Like the ESA-listed species, the regulation of discharges of harmful substances from O&G operations in the POCSR make effects to the CHs unlikely. The EPA's NPDES permits are subject to the requirements of the ESA and are prohibited from adversely modifying ESA-listed CHs. Additionally, the reinjection of drilling fluids, limited quantity of releases, application of mixing zone monitoring requirements, and dilution by natural ocean currents reduce the concentrations of contaminants. Moreover, drilling techniques and equipment have improved and drilling into these mature fields is generally considered to be low risk. Therefore, discharges related to O&G operations **may affect but not likely to adversely affect ESA-listed species and their CHs.**

6.4 Platform Lights

Studies suggest that artificial light effects include disorientation, mortality due to collisions with lighted structures, and interruption of natural behaviors. Birds that spend most of their lives at sea are often highly influenced by artificial lighting in coastal areas and dark ocean environments. For example, artificial lighting appears to "confuse" seabirds, particularly during their migration between urbanized nesting sites and their offshore feeding grounds. Podolsky (2002). Fledgling storm-petrels, shearwaters, and some alcids are more attracted to artificial lights than are adults (Montevecchi 2006).

Direct effects to seabirds include collisions with lighted structures or the light fixtures (Montevecchi 2006). Mass collisions of birds with lighted structures can result in high levels of mortality. Seabirds are attracted to the flares of offshore O&G platforms and can be killed by intense heat, collisions with structures, and by oil on and around the platforms (Wiese et al. 2001, Burke et al. 2005). Both the intensity and oceanographic novelty of these light sources could have a cumulative effect on the attraction and mortality of seabirds.

Indirect effects associated with artificial lighting such as the holding or trapping of migrating birds at intense light sources can deplete their energy reserves (Montevecchi 2006). Lighting could also attract predators (e.g., gulls and Peregrine Falcons) to the vicinity of offshore platforms, which in turn could predate upon nocturnal seabirds attracted by artificial lights.

The Pacific OCS platforms are currently and will continue to be lit for compliance with the U.S. Coast Guard (USCG) navigational hazard requirements during routine operations. Lighting on the platforms will be sufficient to assure safe operations and to be in compliance with USCG navigation hazard requirements but are not expected to result in significant impacts to the marine wildlife found in the region if the recommended mitigations are implemented. Recent observations from platforms Irene, Hermosa, Gail, Gina, and Edith by Reitherman and Gaede (2010) in the fall of 2010 indicated that bird species observed during 20 night-monitoring events showed no signs of being attracted to or confused by the lit platforms they were monitoring.

Nighttime marine construction is anticipated for some of the proposed action, and therefore lit project vessels are expected to be present at project sites or while transiting between the port and the project sites for these temporary activities. USCG-required vessel lighting is expected to be onboard all vessels. The potential effects of lighting on marine wildlife, particularly birds, are expected to be minimal if deck lighting is shielded and directed inward to avoid over-water lighting.

Although lights associated with the offshore oil platforms off southern California do appear to attract seabirds, it is not known whether or to what extent such attraction disrupts migration or foraging behavior. Specifically, although the Point Arguello platforms have been operating for 20 years or longer, there has been no indication that platform lighting has significantly affected any seabird species.

Artificial night lighting on the platforms and project vessels may have an effect on individual sea birds and potentially on nocturnal bird species such as the Marbled Murrelet. Marbled Murrelets are known to occur in the vicinity of the project area during both the breeding and non-breeding seasons, and are nocturnal foragers known to be attracted to artificial lighting. However, there is limited evidence of seabirds being attracted to Pacific OCS platforms or other project lighting in the area, and many projects on the Pacific OCS incorporate minimization measures to reduce effects of work vessel lighting to birds (e.g., lighting on vessels directed inboard and downward, PSOs inspect lighted work areas where birds may be attracted to, etc.). Due to limited documentation of birds attracted to the OCS platforms and minimizations in place to reduce potential impacts if they came in the vicinity of the action area at night, we have determined that these elements of the proposed actions are discountable and **may affect, but are not likely to adversely affect** ESA-listed species.

6.5 Assessment of Oil Spill Risk and Impacts

For the purposes of this consultation request, BOEM does not consider oil spills to be a *direct* effect of the action, given they are neither authorized nor intended to occur. BOEM does, however, concur that certain smaller oil spills could be an *indirect* effect of the action, as defined under ESA regulations, given they could be caused by the proposed action and are later in time, but still are reasonably certain to occur. This Biological Assessment therefore provides scenario and other information related to smaller accidental oil spills in Appendix A.

Furthermore, BOEM does not consider a catastrophic spill, such as 2010 Deepwater Horizon blowout and oil spill, to be an effect of the action, as defined under the ESA implementing regulations at 50 CFR §402.02. Such a large spill is (1) not an anticipated result of the proposed action, and (2) not reasonably certain to occur. Given the advanced state of knowledge of SCPA's geology and reservoirs, and given improvements in drilling techniques and equipment, drilling into these mature fields is considered to be low risk. The majority of SCPA reservoirs have low to no pressure and require artificial lift to access the oil.

Sections 6.5 and 6.6 of this BA provide scenarios and other information related to accidental oil spills (see Appendix A for further details). Section 6.5 covers oil spill risk, starting with subsection 6.5.1 on pipelines and the potential of increased risk associated with aging infrastructure. Section 6.6 analyzes the effects of oil spills on species.

6.5.1 Pipeline Infrastructure

There are four leak-detection and inspection systems for pipelines and other infrastructure.

6.5.1.1 Pipeline leak detection system

A leak detection system is required on all oil pipelines in the POCSR. The authority for the requirement is based on 30 CFR 250.1004(b)(5). The system consists of equipment at both the production end of the pipeline (the offshore platform) and at the onshore delivery point. The system uses instrumentation to compare the volume of material sent from the platform to the volume of material received onshore. If there is no difference in the two volumes, this indicates that there is no leak. Note that a leak detection system does not prevent a leak from occurring; but it plays a crucial role in limiting the impact of a leak. The system is required to include an alarm so that operators are notified when there is a discrepancy between the input and output volumes. The system is also required to have adequate sensitivity to detect variations between the input and output volumes. In lieu of the foregoing system description, the BSEE can approve an alternate method of a system capable of detecting leaks in the pipeline. Prior to a leak detection system's installation, a BSEE engineer reviews the system. The engineer is also notified at least 72 hours prior to the system's initial testing to allow BSEE the opportunity to witness the test.

6.5.1.2 Pipeline internal inspection

Permittees of pipelines are required to perform internal inspections in alternating years by a third party, within an interval not to exceed 13 months. Inspection plans must be submitted to BSEE for review a minimum of 30 days before the surveys are conducted. The survey results must be received by BSEE within 60 days after inspection completion. The internal surveys are done to identify corrosion and/or damage using methods approved by BSEE. BSEE reviews the inspection results for indications of characteristic "red flags" that would shut in a pipeline, i.e., wall loss of 80% or greater (ASME B 31G); dents over 6% or with a gouge, stress riser, or corrosion; or dents over 2% at girth or seam welds (ASME B 31.3 and 31.8). If a pipeline has a wall loss in the 70–79% range or a significant increase of wall loss from the prior internal inspection, BSEE will consider a verification inspection. If the inspection indicates that the pipeline does not provide safe and pollution-free transportation of fluids, the pipeline will be shut in.

6.5.1.3 Pipeline external inspection

Permittees of pipelines are required to perform external inspections in alternating years by a third party, within an interval not to exceed 13 months. Inspection plans must be submitted to BSEE for review a minimum of 30 days before the surveys are conducted. The survey results must be received by BSEE within 60 days after inspection completion. External inspections are to be conducted by a remotely operated vehicle (ROV) with video and sonar, a high- or ultra-high resolution side scan sonar, or another method approved by BSEE. Inspection points include pipeline risers and riser clamps; any grout bags, spans, debris or other object which might constitute a pipeline safety concern or hazard to commercial fishermen or other users; identification of any weight or other coating damage; identification of third-party damage, such as anchor scars; observations of rectifiers and anodes; and visual inspection of the splash zone.

6.5.1.4 Structure inspection

Title 30 CFR Part 250 Subpart I contains requirements for the maintenance, inspection, and assessment of platforms and related structures on the POCSR. Lessees and operators must ensure the structural integrity of all platforms and related structures on the POCSR for the safe conduct of drilling, workover, and production operations. Lessees and operators must implement a comprehensive in-service inspection plan for all POCSR platforms and structures. They must submit an inspection report to BSEE annually. The report must include the following:

- A list of fixed and floating platforms inspected in the preceding 12 months;
- The extent and area of inspection for both the above-water and underwater portions of the platform and the pertinent components of the mooring system for floating platforms;
- The type of inspection employed (e.g., visual, magnetic particle, ultrasonic testing);
- The overall structural condition of each platform, including a corrosion protection evaluation; and
- A summary of the inspection results indicating what repairs, if any, were needed.

During platform visits, BSEE inspectors visually inspect platforms and the pipelines and conductors that descend from them for structure issues. BSEE inspectors also respond to accidents and other hazardous incidents that are reported by the lessee/operator.

BOEM asserts these systems help support the conclusion that the age of the infrastructure is not a major factor in oil spill risk. Further, BOEM asserts there is no indication that age of infrastructure has contributed to recent large oil spills in the region. BOEM highlights that the investigation into the 2021 Huntington Beach oil spill by the National Transportation Safety Board determined that the spill resulted not due to age of infrastructure, but from contact of cargo ship anchors with the underwater pipeline (https://data.ntsb.gov/Docket/?NTSBNumber=DCA22FM001).

6.5.2 Oil Spill History and Causes

In day-to-day platform operations, accidental discharges of hydrocarbons (aka, oil) may occur. Such accidents are typically limited to discharges of quantities of less than one barrel (bbl) of crude oil. From 1963 to 2022, 1,451 oil spills were recorded.

The total volume of oil spilled in the Pacific Region is dominated by the 1969 Santa Barbara Spill (80,900 bbl) which occurred soon after production began. During 1970–2022, there were 1,449 oil spills with a total volume of 1,508 bbl, which represents less than 2% of the volume spilled in 1969. Most of the spills were less than 1 bbl each.

The largest spill during 1970–2022 was the 588 bbl Beta Unit spill (“Huntington Beach” spill) in October 2021 from Amplify Energy Corporation’s San Pedro pipeline P00547 (Appendix, Table A-1). In a settlement agreement (Case No. 8:21-cv-01628-DOC-JDE, Document 476-4, U.S. District Court for the

Central District of California, 2022), the corporate defendants asserted that the spill was a result of severe damage to pipeline P00547 from two container ships that repeatedly dragged their anchors across it. Without accepting responsibility, the shipping companies agreed to contribute funds to the remediation process. The next 6 largest spills were (in descending order of size; Appendix A, Table A-1): 164 bbl in 1997 due to a pipeline break in the flange metal in State waters due to welding flaws; 150 bbl in 1996 due to equipment failure and error allowing emulsion to flow through flare boom; 101 bbl in 1990 from mineral oil mud released due to incorrectly positioned standpipe and closed valves; 50 bbl in 1994 due to process upset resulting in overflow of oil/water emulsion from tanks into disposal tube; and 50 bbl in 1991 after a pipeline riser ruptured when snagged by grappling hook used by workboat to retrieve a lost anchor. The source of oil spilled in 2012 (35.78 bbl; Appendix, Table A-1) was primarily from Platform Houchin caused by a burst plate (35 bbl, per USCG).

BSEE oil spill reporting requirements, along with development of more stringent regulations, implementation of rigorous inspection programs, imposition of civil and criminal penalties, and changes in equipment and procedures have all contributed to a safer work environment. Most recently, BSEE has promulgated regulations that require offshore operators to develop safety and environmental management systems which are intended to foster a corporate culture of environmentally responsible and safe working conditions.

6.5.3 Oil Spill Probability and Rate

BOEM calculated oil spill rates for the Pacific Region using oil spill data (1963–2022) and cumulative production from the Pacific Region (Appendix A: Table A-1). BOEM estimated the number of oil spills and the probability of one or more spills that could occur as a result of ongoing activities in the SCPA in the “50 to 1,000 bbl” size range using Pacific Region oil spill rates. Oil spill occurrence is calculated as a function of the total amount of oil that could be economically produced in the SCPA. The probability is based on the exposure to oil. There is 0.226 Bbbl of oil remaining that could be economically produced (exposed to a potential oil spill). BOEM estimates, in the “50 to 1,000 bbl” size range, there will be 1 spill with a 63% probability of occurrence (Appendix A: Table A-2).

For comparison, BOEM calculated oil spill probabilities using oil spill rates derived from all U.S. OCS operations (1996–2010) and the total amount of oil that could be economically produced in the SCPA (Appendix A: Table A-2). Using spill rates based on all U.S. OCS Operations (1996–2010), the probability of one or more spills occurring in the Pacific Region for the “50 to 1,000 bbl” size range is 95% (Appendix A: Table A-2). The lower probability (63%) of spills in the “50 to 1,000 bbl” size range using POCSR oil spill data is reflective of the lower number of oil spills throughout POCSR production history. Using spill rates based on all U.S. OCS operations (1996–2010), the probability of one or more spills occurring in the greater than 1,000 bbl size range is 7% (Appendix A: Table A-2). This is a conservative estimate based on overall U.S. OCS operations. For the greater than 1,000 bbl size range, BOEM did not calculate oil spill rates with only POCSR data due to the limited dataset (2 spills > 1,000 bbl occurred in 1969). A spill of this size would be an unlikely event in the POCSR, because most reservoirs have low to no pressure due to the maturity of the oil fields.

Taking into account these factors, the overall risk of an oil spill has declined in the SCPA. Oil production has continued over the decades, so there is now less oil to be produced and therefore less oil that could be accidentally spilled. However, other factors such as human error or equipment failure play a role in the risk of an oil spill, and small spills are likely to continue as long as oil is produced.

In summary, oil spill probability estimates are conservative given POCSR’s:

- oil spill history,
- long established drilling program,

- producing from mature fields with lower pressure,
- no floating drilling rigs,
- no new platforms being installed, and
- all oil is transported via pipelines.

6.5.4 Oil Spill Trajectory Analysis

Oil spill trajectory modeling was conducted to determine the movement and fate of spilled oil if a spill occurred in the Southern California Planning Area from existing offshore O&G operations. BOEM collaborated with the National Oceanic & Atmospheric Administration (NOAA) Office of Response & Restoration to create a Trajectory Analysis Planner (TAP) for the Southern California Planning Area (Righi et al. 2024). A regional TAP involves the development of a database created by analyzing statistics from a large number of simulated spill trajectories. These trajectories were run using the General NOAA Operational Modeling Environment (GNOME) with forcing from a high-resolution (1 km) Regional Ocean Modeling System (ROMS, Shchepetkin and McWilliams 2005) hindcast (Appendix A). This extensive model output allows modeling of realistic oil spill scenarios over a range of different regional oceanographic regimes (such as upwelling, relaxation, and eddy-driven flow).

Modeled spills were started at the locations of the 23 Federal offshore O&G platforms in southern California and four pipeline locations, where oil is brought to shore, and represent the geographic range of the Southern California Planning Area. A maximum hypothetical spill of 1,000 bbl was simulated from each location using a spill rate of 200 bbl per day for 5 days. These numbers are conservative. It is highly unlikely that 200 bbl per day could spill from existing facilities over a 5-day period. Hypothetically spilling this large volume within the modeling environment allows analysts to better visualize where oil may travel if a spill occurred with no containment. The visualizations of the modeled spills can be accessed online through the web-based TAP viewer (https://tap.orr.noaa.gov/#locations/south-california/impact_analysis).

6.5.5 Oil Characteristics and Spill Risk

The American Petroleum Institute (API) number is a unique number assigned to every O&G well and is used by agencies to identify and track O&G wells. Oil in the SCPA ranges from very heavy (API 12) to very light (API 39). Crude oil contains different compounds of toxic aromatic chemicals that have at least one benzene ring. When crude oil is released, it immediately begins the degradation process, or weathering. Some oil compounds will weather by evaporation, dispersion into water, or bacterial degradation, while others will not, such as polycyclic aromatic hydrocarbons (PAHs). Different crude oils have different chemical compositions that are governed primarily by the geologic conditions under which they were formed, migrated, and accumulated. These conditions can result in oil from a given location or geologic formation having a unique chemical composition, including specific compounds that help experts distinguish one crude oil from another.

After a spill, oil may sink, become entrained in the water column, or surface. Light crude oils can lose up to 75% of their initial volume within a few days of a spill (NRC 2003), while heavy oil (API < 22) has a negligible evaporation rate and solubility in water. The moment oil reaches the surface, it begins to evaporate the aromatic compounds, and the remaining heavier compounds react to other environmental conditions (i.e., sun, wind, waves, currents). Natural gas may remain submerged and be degraded by bacteria prior to reaching the surface, depending on the depth of the spill. The same bacteria produce mucus that may form with oil droplets and cause marine oil snow that then settles to the seafloor.

Oil spills associated with the proposed action can occur for a number of reasons including equipment failure, human error, natural forces such as hurricanes, or a combination of causal factors. Sources of spills include drilling platforms, well-heads, vessels, pipelines, and oil barges. When spills do occur, the size of the spill depends on the volume (in a container or within the earth), the flow rate (a low-pressure/low-flow leak up to a high-pressure/high-flow event), and responses to contain, control, and clean up the spill. An oil release will continue until the reservoir is depleted or until the release is brought under control.

Oil spills are accidental and unpredictable events but are a direct consequence of O&G development and production from federally regulated O&G activities in the SCPA. Oil releases can occur at any number of points during the exploration, development, production, and transport of oil. Any discharge of hydrocarbons into the environment is prohibited under U.S. law. Consequently, there are stringent regulatory mechanisms, industry best practices, and BOEM/BSEE-required spill response plans in place to reduce the risks associated with oil spills.

6.5.6 Oil Spill Response

BSEE regulations at 30 CFR Part 254 require that each OCS facility have a comprehensive Oil Spill Response Plan (OSRP). These plans are not subject to Federal approval and thus not included as part of this consultation (Alaska Wilderness League v. Jewell, 788 F.3d 1212, 1224-25; 9th Cir. 2015). Response plans consist of an emergency response action plan and supporting information that includes an equipment inventory, contractual agreements with subcontractors and oil spill response cooperatives, worst-case discharge scenario, dispersant use plan, in-situ burning plan and details on training and drills. The Coast Guard is the lead response agency for oil spills in the coastal zone and coordinate the response using a Unified Command (UC), consisting of the affected state and the Responsible Party (i.e., the company responsible for spilling the oil) in implementing the Incident Command System (ICS) if an oil spill occurs. Oil spill drills, either agency-lead or self-lead by a company, also use the UC/ICS. California's Office of Spill Prevention and Response (OSPR) assumes the role of the State on-scene coordinator and plays a significant role in managing wildlife operations in the Southern California Planning Area as the State's Natural Resource Agency.

BSEE requires companies that operate in the OCS have the means to respond to a worst-case discharge from their facilities Appendix A, section A-1,). Companies meet this requirement by becoming members of Oil Spill Removal Organizations (OSRO). The Marine Spill Response Corporation (MSRC) is the U.S. Coast Guard-classified OSRO based in Long Beach (www.msrc.org). MSRC is a nation-wide OSRO with multiple responder-class oil spill response vessels and oil spill response barges. They are also equipped to respond to an oil spill 24 hours a day. MSRC is equipped and prepared to respond to oil spill threats to sensitive shoreline areas through the detailed and up-to-date information on sensitive areas and response strategies from the Los Angeles/Long Beach Area Contingency Plan (https://www.wildlife.ca.gov/OSPR/Preparedness/LA-LB-Spill-Contingency-Plan) and the California OSPR (https://www.wildlife.ca.gov/OSPR).

6.5.7 Fate and Effects of Oil

When an oil spill occurs, factors including the type, rate, and volume of oil spilled, geographic location, and oceanographic and meteorological conditions determine the quantity of oil spilled, the degree of weathering, evaporation, and dispersion of the oil, and composition and toxicity of the oil as it disperses. The level of oil spill preparedness, rapidity of response, and the cleanup methods influence the overall impact levels of an oil spill and reduce the chances that a spill contacts a shoreline.

In an oil spill at sea, a slick forms and part of the slick begins evaporating while the action of breaking waves forms oil droplets that are dispersed into the water column. Oil in the SCPA ranges from very heavy (API 12) to very light (API 39). Light oil has a rapid evaporation rate and is soluble in water. Light crude oils can lose up to 75% of their initial volume within a few days of a spill (NRC 2003). In contrast, heavy oil (API < 22) has a negligible evaporation rate and solubility in water.

Depending on the weight of the oil spilled and the environmental conditions (i.e., sea state) at the time of a spill, six to 60% of oil during an oil spill would sink and be in the water column or on the seafloor in the vicinity of the spill. This is supported by a recent study of natural oil seeps at Coal Oil Point in the Santa Barbara Channel that range in depth from 6–67 m offshore of Goleta, California (Leifer et al. 2006) and are assumed to release 100 bbl/day (Farwell et al. 2009). The distribution of heavy oil in a surface slick in the Santa Barbara Channel is primarily influenced by surface currents, and oil falls out of the slick over a period of 0.4 to 5 days (Leifer et al. 2006).

The likely result of a 1,000-bbl spill would be patches of light to heavy tarring of the intertidal zone and localized effects to contacted biological communities. Within several months, natural processes will remove the oil from the rocks and beaches in these high energy rocky coasts, while low energy lagoons and soft-sediment embayments can retain stranded oil residue for several years.

The Santa Barbara Channel contains some of the most active oil seeps in the world and may contribute 20,000 metric tons (173,200 bbl) of crude oil into the marine environment per year (Kvenolden and Cooper 2003; Henkel et al. 2014).

The field observations of oil spill effects on the marine environment are taken mostly from very large oil spills that have occurred throughout the world over the past three decades. This Biological Assessment assumes the very unlikely scenario of one large spill of 1,000 bbl occurring as a result of the proposed action. In perspective, the *Exxon Valdez* spilled about 36,600 metric tons (~270,000 bbl) of crude oil into Prince William Sound in 1989, and the *Sea Empress* released 73,000 metric tons (~540,000 bbl) of crude oil off southwest Wales in 1996. The *American Trader* spilled about 416,000 gallons (~10,000 bbl) of crude oil offshore Huntington Beach, California in 1990.

6.6 Effects of Oil Spills on Listed Species

Oil from spills can affect ESA-listed species through various pathways and often animals may be exposed in all pathways at the same time. Depending on the species, exposure pathways include external contact (through the skin and eyes), inhalation, aspiration, and oil ingestion (through oiled prey or accidental oil ingestion). Disruption of other essential behaviors, such as breeding, communication, and feeding may also occur.

Oil spills can pose a significant threat to marine and shore birds. Because of the migratory nature of many bird species in the region, the significance of any impacts from a spill will depend on the habitats affected, the time of year, species present, and the numbers of birds in the area at the time of the spill. The immediate danger of oil to most birds is to clog or mat feathers which can lead to hypothermia, loss of buoyancy, impaired ability to fly and forage, and birds may ingest oil through preening. Oiling can kill bird embryos (Albers 1978; Szaro et al. 1978), and birds may leave an area that has been affected by a spill (Hope et al. 1978; Chapman 1981; Albers, 1984). Birds and their habitats are also subject to long-term effects from oil that remains in the environment (Laffon et al. 2006; Alonso-Alvarez and Ferrer 2001).

The following subsections consider effects of oil spills on ESA-listed species (and CH in section 6.7). We compare predictions for oil spill coverages (Figure 11) to species ranges (Figure 12, Figure 13, Figure 14: range figures also in section 5). These spatial comparisons were based on TAP output (https://tap.orr.noaa.gov/#locations/south-california/impact_analysis) using the following settings: maximum hypothetical spill of 1,000 bbl from each location (using a spill rate of 200 bbl/day for 5 days with a level of concern of 5 bbls per cell), and a trajectory based on 21 days duration (i.e., 3-week period) without containment or other response efforts following a spill (details of the TAP modeling are in Appendix A-4). These parameters were used to calculate the percentage of 1,000-barrel spills for which at least 5 bbl of oil may reach any specific cell (i.e., locations) associated with the area of interest/concern over a simulated 3-week period following a spill. These percentage represents our estimates of “risk” described in our analysis.

Each TAP image is a statistical composite of 200 individual modeled spills using the given parameters for a spill from a specified platform, pipeline, or complex (Figure 11). These screen shots indicate modeled predictions for where oil will disperse as it weathers. The colors indicate the percentage of modeled spills that resulted in a volume of oil greater than the Level of Concern (LOC; here 5 bbl) occurring in a particular grid cell, at least once within the 21 days since the start of the spill. The green middle values of the color gradient represent oil dispersion in 40 to 60% of modeled spills. Red values are at the high end of the gradient, with blue cells at the low end representing > 0% to 30% of scenarios. Colors do not provide information about amounts of oil, beyond indicating that the LOC is predicted to be exceeded at least once during one or more of the modeled spills (Righi et al. 2024).

Furthermore, based on OCS spill data for California, the most likely oil spill scenario for the SCPA, is that about 1 spill (0.99 spills) between 50 and 1,000 bbl has a 63% probability of occurrence during the life of the project (Section 6.5.3, Appendix A). Although the level of impact would depend on the size of the spill, the success of containment efforts, and the length of time for the spill to reach the mainland or island coasts, this OCS data will be discussed in the subsequent sections (Section 6.6 and 6.7).

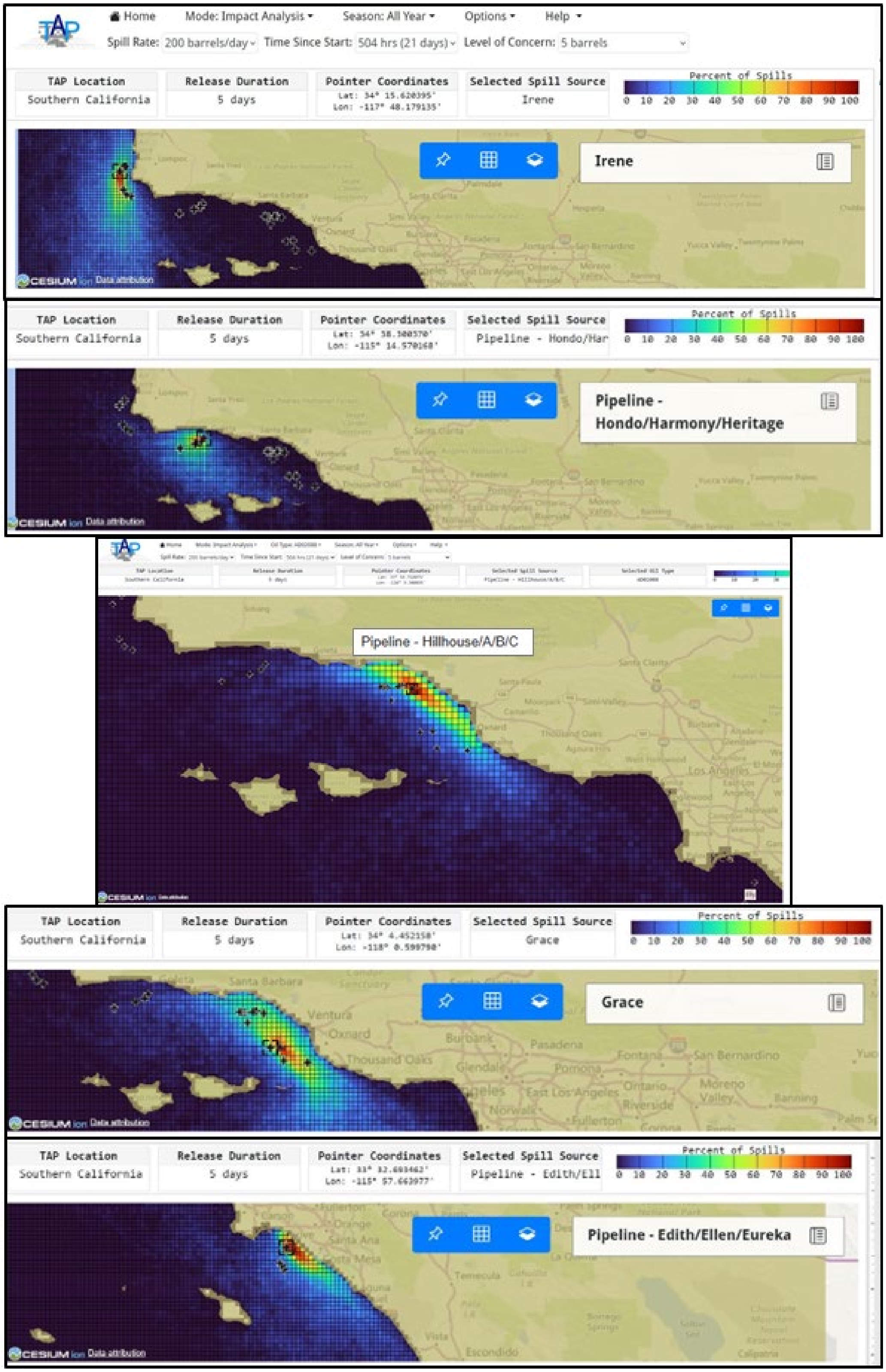

Figure 11. Spill trajectory results for accidental spill from infrastructure in the SCPA.
Modeled trajectory of oil 21 days after the start of a spill with a concern level of 5 bbl from a spill lasting 5 days, spilling 200 bbl/day from a platform or pipeline. Panels ordered top to bottom from north to south. Panel for Pipeline Hillhouse/A/B/C screenshot from TAP on May 7, 2025; all other panels from NMFS (2024b).

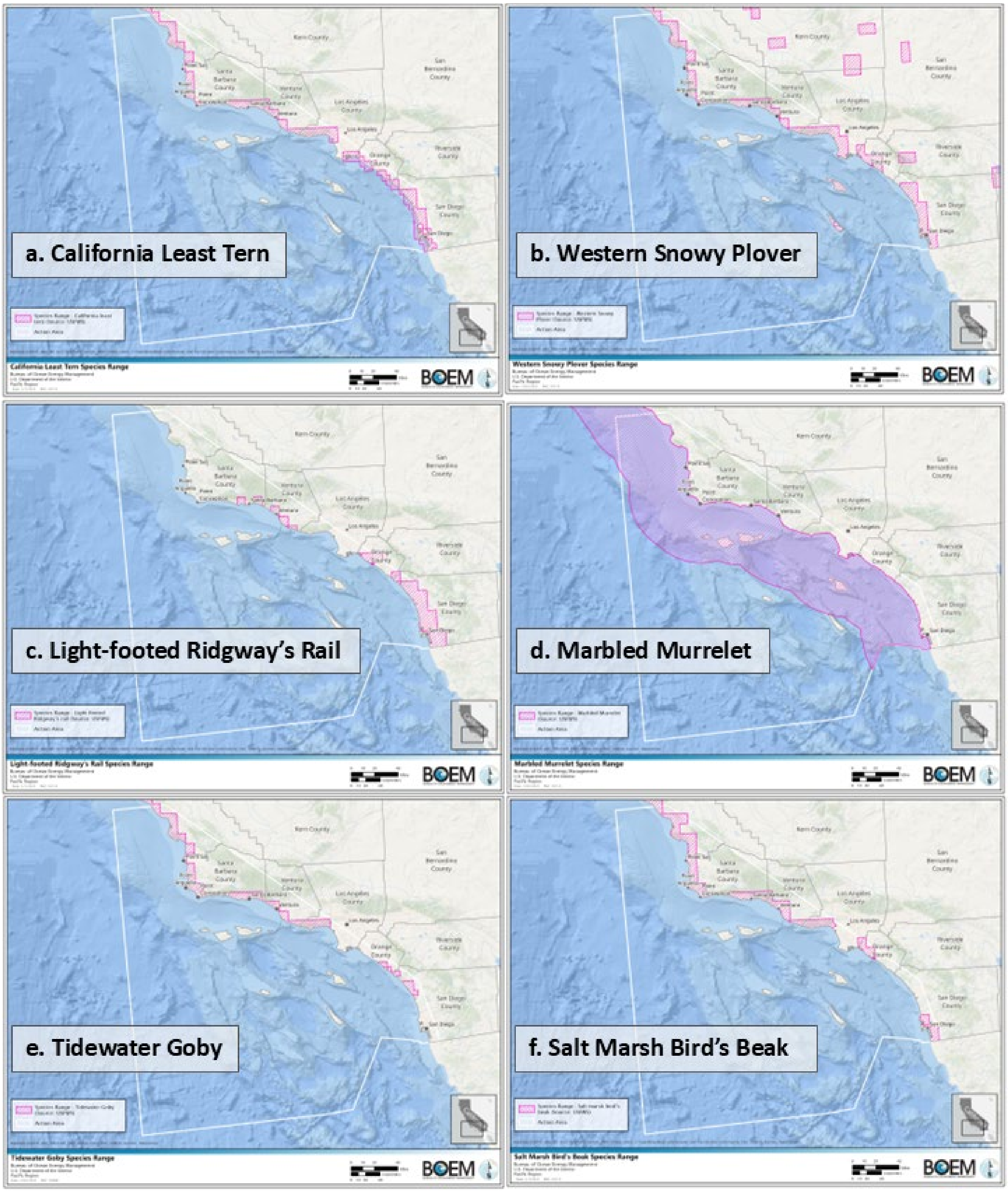

Figure 12. Species ranges for six of the listed species analyzed in this BA relative to the action area (a) California least tern, (b) Western snowy plover, (c)light footed Ridgway's rail, (d) marbled murrelet, (e) tidewater goby and (f) salt marsh's bird's beak.

6.6.1 Southern Sea Otter

Southern sea otters are particularly vulnerable to oil contamination which compromises the insulative properties of their fur (Geraci and Williams 1990; Williams and Davis 1995), and oil spill risk from large vessels that transit the California coast remains a primary threat to the southern sea otters (USFWS 2015). The species' vulnerability to oil spills has been exacerbated by the historically slow pace of natural range expansion (resulting from the spatial configuration of available habitat along the mainland California coast and the limited mobility of reproductive females) and by curtailment of range expansion caused by high levels of shark bite mortality at the range ends (Tinker et al. 2016; Hartfield et al. 2019). Fouling of 30% of an otter's body surface can cause death (Kooyman and Costa 1979). Several thousand sea otters died within months of the *Exxon Valdez* oil spill, and chronic effects occurred for at least three years (Ballachey et al. 1994). In addition to hypothermia, otters died from pulmonary emphysema and lesions to internal organs. Potential indirect effects on southern sea otters resulting from an oil spill include a reduction in available food resources due to mortality or unpalatability of prey organisms and the loss of appropriate habitat available to sea otters as kelp forest communities become contaminated (Riedman 1987).

Within the SCPA, southern sea otters are regularly found along the entire coast of San Luis Obispo County, along the Santa Barbara County coastline from the Santa Maria River mouth to Gaviota, and around San Nicolas Island (Figure 13). These areas are within the TAP outputs that represent oil spill scenarios if a platform or a pipeline (or series of pipelines) resulted in an oil spill (Figure 11, Figure 13). For example, the TAP model of oil spill trajectories with higher densities of sea otters includes the San Luis Bay vicinity (approx. 3.5–10 otters/500 m of shoreline) and either side of Point Conception (2.3–3.5 otters/500 m of shoreline). Additionally, another TAP output displays areas of the coastline from the Santa Maria River mouth to Gaviota and the northern Channel Islands were most likely to be affected by an oil spill from Platform Irene pipeline (Figure 11). The TAP analysis for the Irene pipeline displays the highest probability (36%) of oil contacting land at Point Arguello. Spilled oil traveling from Irene pipeline to as far north as Cambria (1%). A spill from the pipeline for Platforms Hondo/Harmony/Heritage has a 19–28.5 % chance of hitting land at Gaviota. Thus, there is a reasonable chance that a spill would contact the shoreline at the southern end of the present southern sea otter range from San Luis Bay to Goleta and a lower probability (1%) of oil contacting San Nicolas Island from Platform Heritage, Hondo, or Harmony. Predicting the length of coastline affected by an oil spill that comes ashore is extremely difficult due to the complexity of the process, which depends on factors such as nearshore wind patterns and currents, coastal bathymetry, tidal movements, and turbulent flow processes. However, there is a reasonable probability of southern sea otter contacts occurring as a result of a spill within the SCPA.

Based on the TAP output mentioned above with probability of 1-36% of oil contacting the shoreline within the sea otter range and OCS data indicating 63% of probability of an oil spill occurring within the SCPA (Section 6.5.3, Appendix A), there is a reasonable probability of sea otter contacts occurring as a result of an oil spill leading to an impact of sea otters, including mortality. These impacts could be more severe if a spill occurred during spring months when seasonal migration brings large rafts of (predominately male) sea otters to the southern extent of their current range, off Point Conception. Additionally, if southward range expansion by the southern sea otter continues, increasing numbers of otters will be expected to occur east of Point Conception to Gaviota that could be affected in the event of an oil spill. Although oil spill prevention, detection, and response measures limit impacts to otters, we expect reasonable probability of an oil spill within their species range that leads to impacting the sea otter population. Therefore, we have determined that indirectly, the proposed action **may affect and are likely to adversely affect** the southern sea otter.

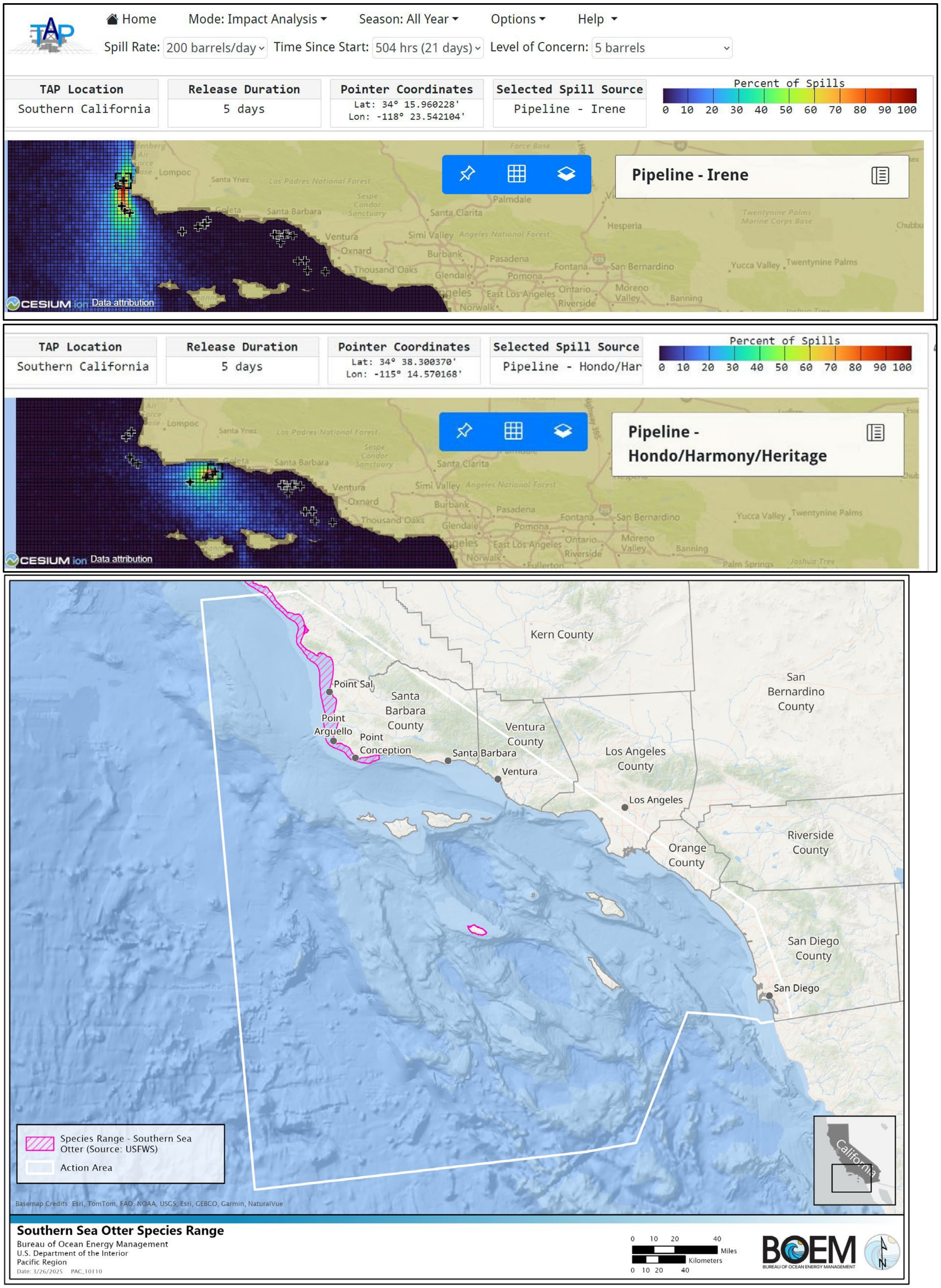

Figure 13. Two TAP outputs in the vicinity of the southern sea otter range.
Top 2 panels: Spill trajectory model for two pipelines (NMFS 2024b).
Lower panel: Southern portion of the southern sea otter species range relative to the action area.

6.6.2 California Least Tern

The California Least Tern is highly susceptible to oiling, because they nest and roost on beaches and mud flats that may be contacted by an oil spill or are in close proximity to the ocean or an estuary. They can experience direct mortality from oiling of birds and eggs and could also experience loss of prey availability due to contamination. They could also be exposed directly to oil if they were feeding in waters affected by a spill because they dive into the water to catch their fish prey. Moreover,, the California Least Tern would be adversely affected if cleanup activities were to occur on nesting beaches.

California Least Terns breed along the coasts of San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego Counties from Oceano Dunes in San Luis Obispo County to the Tijuana River Estuary in San Diego County (Figure 12). These areas are within the TAP outputs that represent oil spill scenarios if a platform or a pipeline (or series of pipelines) resulted in an oil spill (Figure 11). For example, e one of the TAP outputs display areas of the coastline that overlaps with the tern's breeding areas including the Santa Maria River mouth to Gaviota and the northern Channel Islands. These areas will most likely be affected by an oil spill from Platform Irene pipeline (Figure 11). Other TAP outputs that overlap with the tern's range include the TAP analysis for the Irene pipeline which displays the highest probability (36%) of oil contacting land at Point Arguello. Spilled oil traveling from Irene pipeline to as far north as Cambria (1%). A spill from the pipeline for Platforms Hondo/Harmony/Heritage has a 19–28.5 % chance of hitting land at Gaviota. A spill from the pipeline for Platforms Hillhouse/A/B/C would have a 13–63.5% chance of hitting the shoreline from Santa Barbara to Port Hueneme. A spill from Platform Grace has a 13–26% chance of hitting the mainland from Santa Barbara to Port Hueneme and an 18.5% chance of landing on the eastern end of Anacapa Island. A spill from the pipeline for Edith/Ellen/Eureka has a 14.5–71% chance of hitting the shoreline between the port of LA/Long Beach and Dana Point and a 1% chance of landing on the eastern side of Catalina Island. Predicting the length of coastline affected by an oil spill that comes ashore is extremely difficult due to the complexity of the process, which depends on factors such as nearshore wind patterns and currents, coastal bathymetry, tidal movements, and turbulent flow processes. However, there is a reasonable probability of California least tern contacts occurring as a result of a spill within the SCPA.

Based on the TAP output mentioned above with the probability of 1-71% of oil contacting the shoreline within the California least tern range and OCS data indicating 63% of probability of an oil spill occurring within the SCPA (Section 6.5.3, Appendix A), there is a reasonable probability of California least tern contacts occurring as a result of an oil spill leading to an impact of California least tern, including mortality. Additionally, there are 18 breeding localities of the terns that are in or directly adjacent to the areas modeled as being impacted by oil spills in the SCPA; thus, we expect that from an oil spill in their ranges, reproduction will be impacted which would lead to a decreased population of terns. The severity of these reproductive impacts would depend on the size of the spill, the length of shoreline contacted, and the number of terns present in the area. Although oil spill prevention, detection, and response measures limit impacts to California least terns, we expect reasonable probability of an oil spill within their species range that leads to impacting their breeding and population levels. Therefore, we have determined that indirectly, the proposed action **may affect and are likely to adversely affect** the California least tern.

6.6.3 Western Snowy Plover

The Western Snowy Plover population has been declining almost since surveys for the taxa were first conducted. Due to their small population, snowy plovers more vulnerable to an oil spill. Western Snowy Plovers primary habitat is on the sandy beaches and forage along the shoreline and in sea wrack (seaweed and other natural wave-cast organic debris) at the high-tide line; thus, they are at risk of direct exposure to oil during spills. They can experience direct mortality from oiling of birds and eggs and could also experience loss of prey availability due to contamination. The Western Snowy Plover could also be adversely affected if cleanup activities were to occur on nesting or wintering beaches.

The Western Snowy Plover occurs along the West Coast and forages for invertebrates on beaches, salt flats, and edges of salt marshes and salt ponds (58 FR 12864). This species breeds from southern Washington to Baja California, Mexico, March to September (64 FR 68507). In the SCPA, Western Snowy Plovers breed or winter along the coasts of San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego Counties in addition to the Channel Islands (Figure 12). These areas are within the TAP outputs that represent oil spill scenarios if a platform or a pipeline (or series of pipelines) resulted in an oil spill (Figure 11). For example, areas of the coastline from the Santa Maria River mouth to Gaviota and the northern Channel Islands, based on TAP outputs, will most likely be affected by an oil spill from Platform Irene pipeline (Figure 11). Another TAP analysis that overlaps with the Western Snowy Plover includes one for the Irene pipeline which displays the highest probability (36%) of oil contacting land at Point Arguello and spilled oil may travel as far north as Cambria (1%) . The Western Snowy Plover's range also includes areas where oil may hit their ranges if the following pipelines and/or platforms lead to an oil spill: platforms Hondo/Harmony/Heritage, platforms Hillhouse/A/B/C, Platform Grace, and pipeline Edith/Ellen/Eureka. A spill from the pipeline for Hondo/Harmony/Heritage has a 19–28.5 % chance of hitting land at Gaviota. A spill from the pipeline for Platforms Hillhouse/A/B/C would have a 13–63.5% chance of hitting the shoreline from Santa Barbara to Port Hueneme. A spill from Platform Grace has a 13–26% chance of hitting the mainland from Santa Barbara to Port Hueneme and an 18.5% chance of landing on the eastern end of Anacapa Island. A spill from the pipeline for Edith/Ellen/Eureka has a 14.5–71% chance of hitting the shoreline between the port of LA/Long Beach and Dana Point and a 1% chance of landing on the eastern side of Catalina Island.

Based on the TAP output mentioned above, with a probability of 1-71% of oil contacting the shoreline within the plover range and OCS data indicating 63% of probability of an oil spill occurring within the SCPA (Section 6.5.3, Appendix A), there is a reasonable probability of plover contacts occurring as a result of an oil spill which can impact plovers. Since Western Snowy Plovers nest and forage in the areas where an oil spill could occur, we expect that their nesting and foraging behaviors would be impacted from an oil spill. Impacts to the nesting populations could include loss of adults, disruption of nesting activity, and abandonment of eggs and nesting beaches. Additionally, impacts to the Western Snowy Plovers could be exacerbated by beach cleanup efforts by having human activity interacting with their habitat. Although oil spill prevention, detection, and response measures limit impacts to plovers, we expect reasonable probability of an oil spill within their species range that leads to impacting the plover population. Therefore, we have determined that indirectly, the proposed action **may affect and are likely to adversely affect** the Western Snowy Plover.

6.6.4 Light-footed Ridgway's Rail

Light-footed Ridgway's Rails are at risk from an oil spill, because 1) they are confined to coastal salt marshes that could be contacted by oil and 2) only two marshes are left within the SPCA that could potentially be used for nests (i.e., if these marshes are oiled, fewer nesting areas available for the rails) . Additionally, individual rails, eggs, nests, and sheltering habitat could suffer from the exposure to oil. The oil spill cleanup process, if not conducted in accordance with federal and state regulations, could also exacerbate the effects of an oil spill on the Light-footed Ridgway's Rail's habitat.

Light-footed Ridgway's Rails inhabit coastal salt marshes from the Carpinteria Marsh in Santa Barbara County, California, to Bahia de San Quintin, Baja California, Mexico (Figure 12). These areas are within the TAP outputs that represent oil spill scenarios if a platform or a pipeline (or series of pipelines) resulted in an oil spill (Figure 11). For example, one of the TAP outputs displays areas of the coastline from the Santa Maria River mouth to Gaviota and the northern Channel Islands were most likely to be affected by an oil spill from Platform Irene pipeline (Figure 11). Another TAP output within the rail's range shows that and oil spill from the Irene pipeline displays the highest probability (36%) of oil contacting land at Point Arguello. Spilled oil is predicted to travel from Irene pipeline to as far north as Cambria (1%). Another TAP output shows that a spill from the pipeline for Platforms

Hondo/Harmony/Heritage has a 19–28.5 % chance of hitting land at Gaviota. Other outputs include a spill from the pipeline for Platforms Hillhouse/A/B/C that would have a 13–63.5% chance of hitting the shoreline from Santa Barbara to Port Hueneme. A spill from Platform Grace has a 13–26% chance of hitting the mainland from Santa Barbara to Port Hueneme and an 18.5% chance of landing on the eastern end of Anacapa Island. A spill from the pipeline for Edith/Ellen/Eureka has a 14.5–71% chance of hitting the shoreline between the port of LA/Long Beach and Dana Point and a 1% chance of landing on the eastern side of Catalina Island.

Based on the TAP output mentioned above with probability of 1-71% of oil contacting the shoreline within the rail range and OCS data indicating 63% of probability of an oil spill occurring within the SCPA (Section 6.5.3, Appendix A), there is a reasonable probability of rail contacts occurring as a result of an oil spill leading to an impact of rails. Since rails nest and shelter in the areas the oil spill could occur, we expect that their nesting behavior and eggs from those nests would be impacted from an oil spill. Impacts to the nesting populations could include loss of adults (i.e., high mortality of oiled birds), disruption of nesting activity, and abandonment of eggs and nesting beaches. Additionally, impacts to the Light-footed Ridgway's Rail could be exacerbated by beach cleanup efforts by having human activity interacting with their habitat. Although oil spill prevention, detection, and response measures limit impacts to rails, we expect reasonable probability of an oil spill within their species range that leads to impacting the rail population. Therefore, we have determined that indirectly the proposed actions **may affect and are likely to adversely affect** the Light-footed Ridgway's Rail.

6.6.5 Marbled Murrelet

The threatened Marbled Murrelet is exceedingly vulnerable to oil spills due to the action area overlapping to their predominately at-sea existence. Mortality due to oil pollution is one of the major threats to Marbled Murrelet populations. Although poorly documented, mortality from large spills and chronic oil pollution has been occurring for decades throughout the species range (Carter and Kuletz 1995). Marbled Murrelets have been impacted by oil pollution in Prince William Sound, central California, and western Washington (Carter and Kuletz 1995). The Exxon Valdez oil spill in Alaska caused the largest single mortality of murrelets (about 8,400 birds) in the world, most of which were Marbled Murrelets, and contributed to the decline of murrelet populations in Prince William Sound.

The Marbled Murrelet spends most of its life in the nearshore marine environment and forage at sea by pursuit diving in relatively shallow waters, usually between 20 and 80 m in depth and 300–2,000 m from shore (Strachan et al. 1995). While the species does not nest in the action area, individuals from the population nesting in the Santa Cruz Mountains are known to disperse to the coast of San Luis Obispo and Santa Barbara Counties which appears to be an important wintering area for the species in central California (Peery et al. 2008; Figure 12). Marbled Murrelets occur less frequently south of Point Conception; however, they are observed occasionally off of Ventura, along the Malibu coastline, and in Santa Monica Bay (Figure 12). These areas are within the TAP outputs that represent oil spill scenarios if a platform or a pipeline (or series of pipelines) resulted in an oil spill (Figure 11). For example, one of the TAP outputs displays areas of the coastline from the Santa Maria River mouth to Gaviota and the northern Channel Islands that is predicted to be most likely to be affected by an oil spill from Platform Irene pipeline (Figure 11). The TAP analysis for the Irene pipeline displays the highest probability (36%) of oil contacting land at Point Arguello. Spilled oil traveling from Irene pipeline is predicted to go as far north as Cambria (1%). Another TAP output shows that a spill from the pipeline for Platforms Hondo/Harmony/Heritage has a 19–28.5 % chance of hitting land at Gaviota. Other outputs include a spill from the pipeline for Platforms Hillhouse/A/B/C would have a 13–63.5% chance of hitting the shoreline from Santa Barbara to Port Hueneme. A spill from Platform Grace has a 13–26% chance of hitting the mainland from Santa Barbara to Port Hueneme and an 18.5% chance of landing on the eastern end of Anacapa Island. A spill from the pipeline for Edith/Ellen/Eureka has a 14.5–71% chance of hitting the shoreline between the port of LA/Long Beach and Dana Point and a 1% chance of landing on the eastern side of Catalina Island.

Based on the TAP output mentioned above with the probability of 1-71% of oil contacting the shoreline within the murrelet's range and OCS data indicating 63% of probability of an oil spill occurring within the SCPA (Section 6.5.3, Appendix A), there is a reasonable probability of murrelet contacts occurring as a result of an oil spill that would impact murrelets. Oil exposure will have various impacts including their wintering and foraging habitats that would decrease in size. Foraging behavior may also be impacted from oil exposure which could result in injury (e.g., hypothermia, starvation) and/or death. Additionally, impacts to the murrelets could be exacerbated by beach cleanup efforts by having human activity interacting with their habitat. Although oil spill prevention, detection, and response measures limit impacts to murrelets, we expect reasonable probability of an oil spill within their species range that leads to impacting the murrelet population. Therefore, we have determined that indirectly, the proposed actions **may affect and are likely to adversely affect** the Marbled Murrelet.

6.6.6 Short-tailed Albatross

Although the range of Short-tailed Albatross includes the action area, albatross are not expected to be present in the action area with any regularity, because records documenting these species exist in the vicinity of the action area are rare. Thus, if an oil spill were to occur within the action area, due to their rare presence within the action area, indirectly the proposed actions **may affect but are not likely to adversely affect** the short-tailed albatross.

6.6.7 Hawaiian Petrel

Similar to the short-tailed albatross, the Hawaiian petrel is not expected to occur with any regularity in the action area. Thus, if an oil spill were to occur within the action area, due to their rare presence within the action area, indirectly the proposed actions **may affect but are not likely to adversely affect** the Hawaiian petrel.

6.6.8 California Red-legged Frog

Oil may affect amphibians through various pathways, including direct contact, ingestion of contaminated prey, and lingering sublethal impacts due to oil becoming sequestered in sediments and persisting in some cases for years in low energy environments (NRC 1985). If the breeding habitat in coastal lagoons is exposed to oil, breeding could be adversely affected that would lead to impacting adults, tadpoles, and egg masses. The level of impacts depends on the volume of oil that reaches the habitat and amount of mixing and weathering of the oil before reaching the habitat. A greater than 1,000-bbl spill is not expected, but if one were to occur and reach wetlands occupied by the California red-legged frog, containment measures might not be able to prevent some impacts to this taxon. The sand berms of lagoons could be breached leading to lethal impacts to California red-legged frogs if individuals were oiled before they could leave the area. Sublethal impacts may occur if the frogs returned before rains flushed the sediments from the lagoons. Another potential scenario is when California red-legged frogs leave lagoons when seawater breaches the sand berms. Although no direct oil contact with California red-legged frogs is expected, oil can be sequestered in sediments until rains flush the sediments from the lagoon. If the sand berms reform and conditions become favorable, some California red-legged frogs may return before the contaminated sediments are flushed into the ocean.

California red-legged frogs are found in several coastal lagoons along the coasts of San Luis Obispo and Santa Barbara Counties south to the vicinity of Goleta, which are part of several core recovery areas for the subspecies (USFWS 2002). Tadpoles have been reported in Jalama and Cañada Honda creeks. (Figure 14). These areas are within the TAP outputs that represent oil spill scenarios if a platform or a pipeline (or series of pipelines) resulted in an oil spill (Figure 11, Figure 14). For example, one of the

TAP outputs displays areas of the coastline from the Santa Maria River mouth to Gaviota and the northern Channel Islands that would most likely be affected by an oil spill from Platform Irene pipeline (Figure 11). The TAP analysis for the Irene pipeline displays the highest probability (36%) of oil contacting land at Point Arguello. Spilled oil traveling from Irene pipeline is predicted to go as far north as Cambria (1%). Other sets of TAP outputs include a spill from the pipeline for Platforms Hondo/Harmony/Heritage which has a 19–28.5 % chance of hitting land at Gaviota. A spill from the pipeline for Platforms Hillhouse/A/B/C would have a 13–63.5% chance of hitting the shoreline from Santa Barbara to Port Hueneme. A spill from Platform Grace has a 13–26% chance of hitting the mainland from Santa Barbara to Port Hueneme and an 18.5% chance of landing on the eastern end of Anacapa Island. A spill from the pipeline for Edith/Ellen/Eureka has a 14.5–71% chance of hitting the shoreline between the port of LA/Long Beach and Dana Point and a 1% chance of landing on the eastern side of Catalina Island.

Although there is some risk of an oil spill reaching the coastal lagoons during a high tide or storm when the sand berms have been breached, we expect that would be a very rare occurrence, and offshore oil transported to shore through natural wind, wave, and tidal processes will not likely flow into lagoons, streams, or rivers where most frogs are expected. Additionally, proper preparation and execution of the oil spill contingency plan should protect these areas during an oil spill response. Thus, if an oil spill were to occur within the action area, due to the rare occurrence of oil hitting their habitat in lagoons, streams and rivers, frogs will unlikely be exposed to oil. Therefore, indirectly, the proposed actions **may affect but are not likely to adversely affect** the California Red-legged Frog.

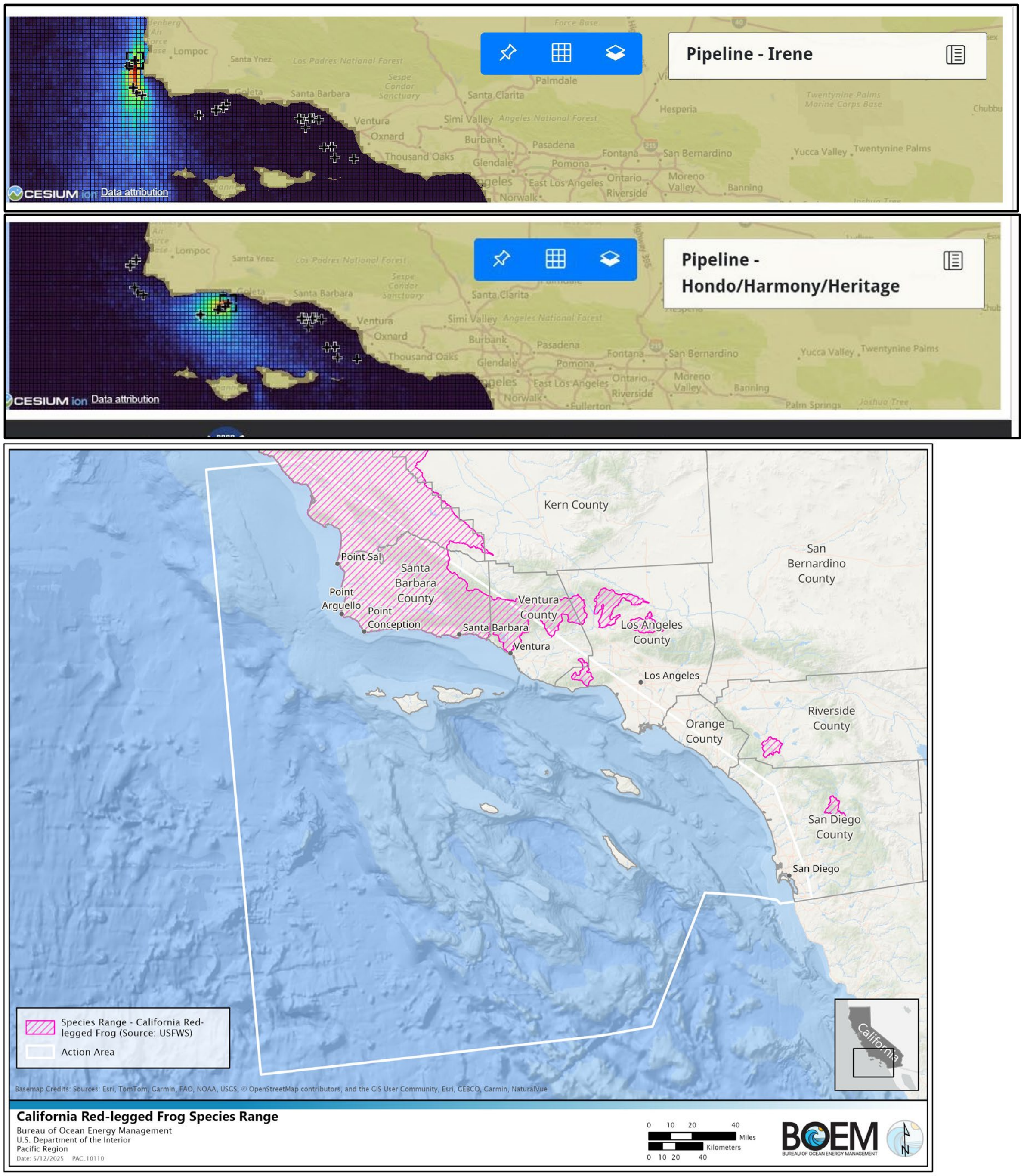

Figure 14. Two TAP model outputs in the vicinity of the California red-legged frog range.
Top 2 panels: Spill trajectory model for two pipelines (NMFS 2024b).
Lower panel: Southern portion of the southern sea otter species range relative to the action area.

6.6.9 Tidewater Goby

Research shows that hydrocarbons and other constituents of petroleum spills can, in sufficient concentrations, cause adverse impacts to fish (NRC 1985; GESAMP 1993). The effects can range from mortality to sublethal effects that inhibit growth, longevity, and reproduction. Benthic macrofaunal communities can be heavily impacted, as well as intertidal communities that provide food and cover for fishes. Although fish can accumulate hydrocarbons from contaminated food, there is no evidence of food web magnification in fish. Fish have the capability to metabolize hydrocarbons and can excrete both metabolites and parent hydrocarbons from the gills and the liver. Nevertheless, oil effects in fish can occur in many ways: histological damage, physiological and metabolic perturbations, and altered reproductive potential (NRC 1985). Many of these sublethal effects are symptomatic of stress and may be transient and only slightly debilitating. However, all repair or recovery requires energy, and this may ultimately lead to increased vulnerability to disease or to decreased growth and reproductive success. The egg, early embryonic, and larval-to-juvenile stages of fish seem to be the most sensitive to oil. Damage may not be realized until the fish fails to hatch, dies upon hatching, or exhibits some abnormality as a larva, such as an inability to swim (Malins and Hodgins 1981). There are several reasons for this vulnerability of early life stages. First, embryos and larvae lack the organs found in adults that can detoxify hydrocarbons. Second, most do not have sufficient mobility to avoid or escape spilled oil. Finally, the egg and larval stages of many species are concentrated at the surface of the water, where they are more likely to be exposed to the most toxic components of an oil slick.

Tidewater Goby are endemic to California and can be found on the coast from Del Norte County south to northern San Diego County (Figure 12). These areas are within the TAP outputs that represent oil spill scenarios if a platform or a pipeline (or series of pipelines) resulted in an oil spill (Figure 11). For example, one of the TAP outputs displays areas of the coastline from the Santa Maria River mouth to Gaviota and the northern Channel Islands which would most likely to be affected by an oil spill from Platform Irene pipeline (Figure 11). The TAP analysis for the Irene pipeline displays the highest probability (36%) of oil contacting land at Point Arguello. Spilled oil traveling from Irene pipeline is predicted to go as far north as Cambria (1%). Other sets of TAP outputs include a spill from the pipeline for Platforms Hondo/Harmony/Heritage has a 19–28.5 % chance of hitting land at Gaviota. A spill from the pipeline for Platforms Hillhouse/A/B/C would have a 13–63.5% chance of hitting the shoreline from Santa Barbara to Port Hueneme. A spill from Platform Grace has a 13–26% chance of hitting the mainland from Santa Barbara to Port Hueneme and an 18.5% chance of landing on the eastern end of Anacapa Island. A spill from the pipeline for Edith/Ellen/Eureka has a 14.5–71% chance of hitting the shoreline between the port of LA/Long Beach and Dana Point and a 1% chance of landing on the eastern side of Catalina Island.

Although gobies are found in shallow coastal lagoons (< 1 m deep), stream mouths, and shallow areas of bays and are absent from areas where the coastline is steep, there is some risk that an oil spill may reach the coastal lagoons during a high tide or storm when the sand berms blocking the stream mouths from the ocean have been breached. Breaches usually occur during the winter and spring months, and tidewater gobies often move upstream out of the lagoons during this period. If an oil spill occurred, oil can become sequestered in the sediments and persist until rains flush the sediments from the lagoon. The coastal lagoons where gobies are found overlap with some of the TAP outputs mentioned above (probability of 1-71% of oil contacting the shoreline within the tidewater goby's range) and OCS data indicating 63% of probability of an oil spill occurring within the SCPA (Section 6.5.3, Appendix A); thus, there is a reasonable probability of goby contacts occurring as a result of an oil spill. Impacts to gobies include short-term sublethal effects (e.g., inhibition of growth, longevity, and reproduction) since gobies burrow into and feed in the sediment and rely on macrofaunal and intertidal communities for food and shelter from predators. Oil exposure to the tidewater goby habitat may also lead to mortality. Additionally, impacts to the gobies could be exacerbated by beach cleanup efforts by having human activity interacting with their habitat. The level of impacts, however, would be dependent on the volume of oil that reached their habitat and the amount of weathering and mixing the oil had undergone before reaching the habitat. Although oil spill prevention, detection, and response measures limit impacts to gobies, we expect reasonable probability of an oil spill within their species range that may lead to goby population impacts. Therefore, we have determined that indirectly, the proposed actions **may affect and are likely to adversely affect** the Tidewater Goby.

6.6.10 Salt Marsh Bird's Beak

Plant mortality from oil spills can be caused by smothering and toxic reactions to hydrocarbon exposure, especially if oil reaches shore before much of the spill's lighter fractions have evaporated or dissolved. Generally, oiled marsh vegetation dies, but roots and rhizomes survive when oiling is not too severe (Burns and Teal 1971). Research has shown that recovery to pre-oiling conditions usually occurs within a few growing seasons, though (Delaune et al. 1979; Alexander and Webb 1987).Specifically for the salt marsh bird's beak, they grow in the higher reaches of coastal salt marshes to intertidal and brackish areas influenced by freshwater input. Oil spills and oil spill clean-up operations within the SCPA, especially within Mugu Lagoon, could have adverse effects on the salt marsh bird's-beak, particularly for seedlings. Spilled oil tends to accumulate near the high tide line, a zone of the marsh where the salt marsh bird's-beak can occur. Oil would very likely result in high mortality of the salt marsh bird's-beak seedlings and juvenile plants during years of seedling regeneration. Oil clean-up operations involving mechanical removal could also cause substantial disturbance of habitat occupied by the salt marsh bird's-beak. The direct effects of oil on mature salt marsh bird's-beak individuals are uncertain but could likely be less than those associated with its clean-up.

Historically, salt marsh bird's-beak was widespread in coastal salt marshes from Morro Bay in San Luis Obispo County to San Diego County and northern Baja California (Figure 12). Salt marsh bird's-beak is currently limited to a very few (<10) salt marshes along the coast of California and Baja California, Mexico, which makes this species more vulnerable to an oil spill. Within the area of coastline that could be affected by oil spills from the SCPA, these marshes include Carpinteria Salt Marsh in Santa Barbara County, Ormond Beach and Mugu Lagoon in Ventura County, and Upper Newport Bay in Orange County. These areas are within the TAP outputs that represent oil spill scenarios if a platform or a pipeline (or series of pipelines) resulted in an oil spill (Figure 11). For example, one of the TAP outputs displays areas of the coastline from the Santa Maria River mouth to Gaviota and the northern Channel Islands would most likely be affected by an oil spill from Platform Irene pipeline (Figure 11). The TAP analysis for the Irene pipeline displays the highest probability (36%) of oil contacting land at Point Arguello. Spilled oil traveling from Irene pipeline is predicted to go as far north as Cambria (1%). Other sets of TAP outputs include a spill from a spill from the pipeline for Platforms Hondo/Harmony/Heritage has a 19–28.5 % chance of hitting land at Gaviota. A spill from the pipeline for Platforms Hillhouse/A/B/C would have a 13–63.5% chance of hitting the shoreline from Santa Barbara to Port Hueneme. A spill from Platform Grace has a 13–26% chance of hitting the mainland from Santa Barbara to Port Hueneme and an 18.5% chance of landing on the eastern end of Anacapa Island. A spill from the pipeline for Edith/Ellen/Eureka has a 14.5–71% chance of hitting the shoreline between the port of LA/Long Beach and Dana Point and a 1% chance of landing on the eastern side of Catalina Island.

Based on the TAP output mentioned above with probability of 1-71% of oil contacting the shoreline within the salt marsh bird's beak range and OCS data indicating 63% of probability of an oil spill occurring within the SCPA (Section 6.5.3, Appendix A), there is a reasonable probability of the salt marsh bird's beak contacts occurring as a result of an oil spill. If their habitat is exposed to oil, their habitat quality will be degraded and could lead to injury and/or mortality of the Salt Marsh Bird's Beak. Although oil spill prevention, detection, and response measures limit impacts to the Salt Marsh Bird's Beak, we expect reasonable probability of an oil spill within their species range. Therefore, we have determined that indirectly, the proposed actions **may affect and are likely to adversely affect** the Salt Marsh Bird's Beak.

6.7 Effects of Oil Spills on Critical Habitat (CH)

Risk to CH of Western snowy plover, California red-legged frog, and Tidewater Goby may be due to accidental oil spills associated with the proposed action. Depending on the type of oil that may accidentally spill due to O&G activities, oil may evaporate, sink or follow a trajectory that depends on the environmental conditions, including sea state, currents, etc.

6.7.1 Western Snowy Plover CH

The current CH designation of the Western snowy plover (77 FR 36727) within the coast of SCPA includes 35 of the 60 units, comprising 6,117 acres (Figure 15). The PBFs of the CH include sandy beaches, dune systems immediately inland of an active beach face, salt flats, mud flats, seasonally exposed gravel bars, artificial salt ponds and adjoining levees, and dredge spoil sites, with:

- Areas that are below heavily vegetated areas or developed areas and above the daily high tides;
- Shoreline habitat areas for feeding, with no or very sparse vegetation, that are between the annual low tide or low water flow and annual high tide or high water flow, subject to inundation but not constantly under water, that support small invertebrates, such as crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods, that are essential food sources;
- Surf- or water-deposited organic debris, such as seaweed (including kelp and eelgrass) or driftwood located on open substrates that supports and attracts small invertebrates for food, and provides cover or shelter from predators and weather, and assists in avoidance of detection (crypsis) for nests, chicks, and incubating adults; and
- Minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators, which provide relatively undisturbed areas for individual and population growth and or normal behavior.

Several of the TAP outputs (i.e., location of where oil may hit assuming oil spill occurs from platforms/pipelines) overlaps with the Western Snowy Plover CHs. For example, areas of the coastline from the Santa Maria River mouth to Gaviota and the northern Channel Islands from the TAP output predicts that these area would most likely be affected by an oil spill from Platform Irene pipeline (Figure 11). The TAP analysis for the Irene pipeline displays the highest probability (36%) of oil contacting land at Point Arguello. Spilled oil traveling from Irene pipeline is predicted to go as far north as Cambria (1%). Other sets of TAP outputs include a spill from the pipeline for Platforms Hondo/Harmony/Heritage has a 19–28.5 % chance of hitting land at Gaviota. A spill from the pipeline for Platforms Hillhouse/A/B/C would have a 13–63.5% chance of hitting the shoreline from Santa Barbara to Port Hueneme. A spill from Platform Grace has a 13–26% chance of hitting the mainland from Santa Barbara to Port Hueneme and an 18.5% chance of landing on the eastern end of Anacapa Island. A spill from the pipeline for Edith/Ellen/Eureka has a 14.5–71% chance of hitting the shoreline between the port of LA/Long Beach and Dana Point and a 1% chance of landing on the eastern side of Catalina Island.

Based on the TAP output mentioned above with probability of 1-71% of oil contacting the shoreline overlapping with some of the Western Snowy Plover CH and OCS data indicating 63% of probability of an oil spill occurring within the SCPA (Section 6.5.3, Appendix A), there is a reasonable probability of the oil contacting the Western Snowy Plover CH as a result of an oil spill. If the CH is exposed to oil, the PBFs listed above would be impacted (e.g., shoreline areas used for feeding, shelter from predators, etc.) which could lead to decreased prey availability, decreased reproductive success, and decreased population growth. Moreover, impacts to the Western Snowy Plover CH could be exacerbated by beach cleanup efforts. Although the level of impact would depend on the size of the spill, the type of oil, the success of containment efforts, the length of time for the spill to reach the area, and the length of shoreline contacted, and oil spill prevention, detection, and response measures limit impacts to the Western Snowy Plover CH, we expect reasonable probability of an oil spill within the CH area. Therefore, we have determined that indirectly, the proposed actions **may affect and are likely to adversely affect** the Western Snowy Plover CH.

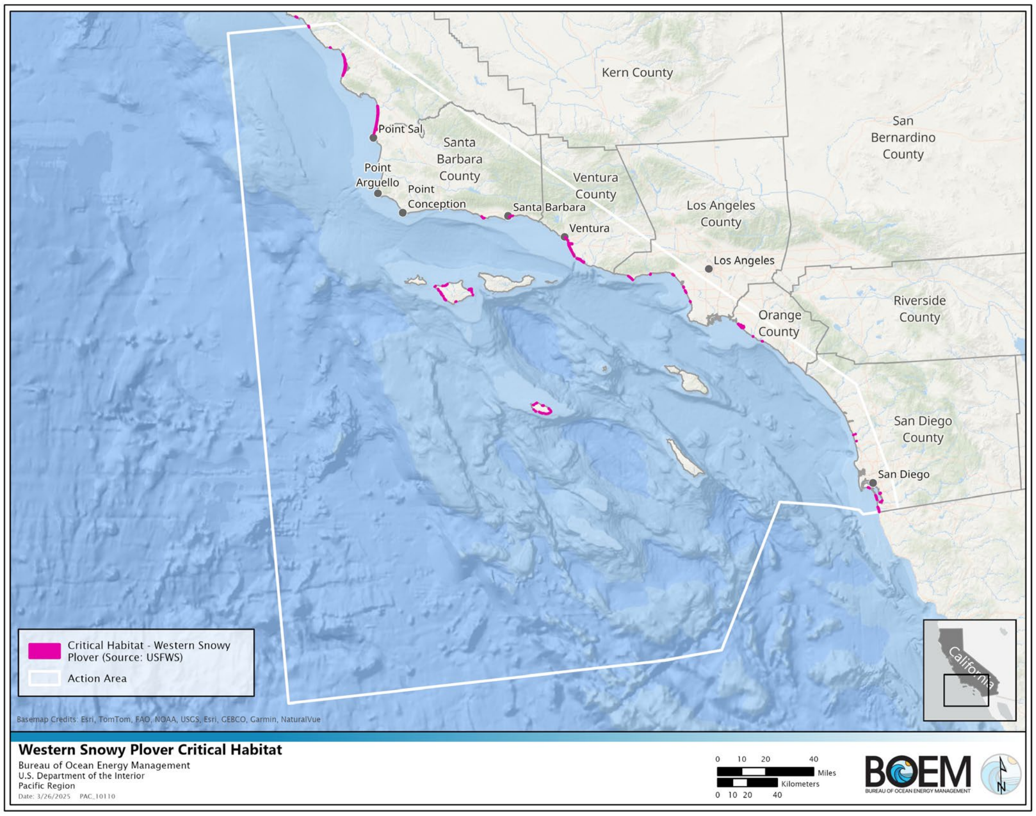

Figure 15. Western snowy plover critical habitat relative to the action area.

6.7.2 California Red-legged Frog CH

There are five CH units that include coastal areas that have a boundary with the coastline in the SCPA (SLO-2, SLO-3, STB-4, STB-5, STB-6) and include watersheds that flow into the ocean or coastal lagoons (Figure 16). Three of these (STB-4, STB-5 and STB-6) are in areas that could be impacted by an oil spill within the SCPA. The PBFs essential to the conservation of the species encompassed within these units include aquatic breeding habitat, aquatic non-breeding habitat, upland habitat, and dispersal habitat. At Jalama Creek, 4.4 mi south of the City of Lompoc, 7,685 acres along the coast were designated, at Gaviota Creek 12,888 acres were designated, and at Arroyo Quemado to Refugio Creek 11,985 acres were designated (75 FR 12816).

Several of the TAP outputs (i.e., location of where oil may hit assuming oil spill occurs from platforms/pipelines) overlaps with the California Red-legged Frog CH. For example, the TAP output displays areas of the coastline from the Santa Maria River mouth to Gaviota and the northern Channel Islands would most likely be affected by an oil spill from Platform Irene pipeline (Figure 11). The TAP analysis for the Irene pipeline displays the highest probability (36%) of oil contacting land at Point Arguello. Spilled oil traveling from Irene pipeline is predicted to go as far north as Cambria (1%). Other sets of TAP outputs include a spill from the pipeline for Platforms Hondo/Harmony/Heritage has a 19–28.5 % chance of hitting land at Gaviota. A spill from the pipeline for Platforms Hillhouse/A/B/C would have a 13–63.5% chance of hitting the shoreline from Santa Barbara to Port Hueneme. A spill from Platform Grace has a 13–26% chance of hitting the mainland from Santa Barbara to Port Hueneme and an 18.5% chance of landing on the eastern end of Anacapa Island. A spill from the pipeline for Edith/Ellen/Eureka has a 14.5–71% chance of hitting the shoreline between the port of LA/Long Beach and Dana Point and a 1% chance of landing on the eastern side of Catalina Island.

Although the TAP output mentioned above indicates the probability of 1-71% of oil contacting the shoreline and OCS data indicates 63% of probability of an oil spill occurring within the SCPA (Section 6.5.3, Appendix A), it is unlikely and would be rare that spills reasonably certain to occur during the day-to-day oil production, and development activities would have sufficient volume to expose oil upstream habitats (e.g., lagoons) containing PBFs 3 and 4 of CH of the California Red-legged Frog species (aquatic non-breeding and aquatic breeding habitat, respectively). Accordingly, it is unlikely that these spills would either reduce the availability of any of the PBFs of CH or impair the function of CH units for the survival and recovery of the California red-legged frog. Moreover, proper preparation and execution of the oil spill contingency plan would protect these areas during an oil spill response. Based on this information, effects to the California Red-legged Frog CH from an oil spill in the SCPA are expected to be discountable (i.e., extremely unlikely to occur) due to the rare likelihood of oil exposure to California Red-legged Frog CH. Therefore, we have determined that indirectly, the proposed actions **may affect but are not likely to adversely affect** the CH of the California red-legged frog.

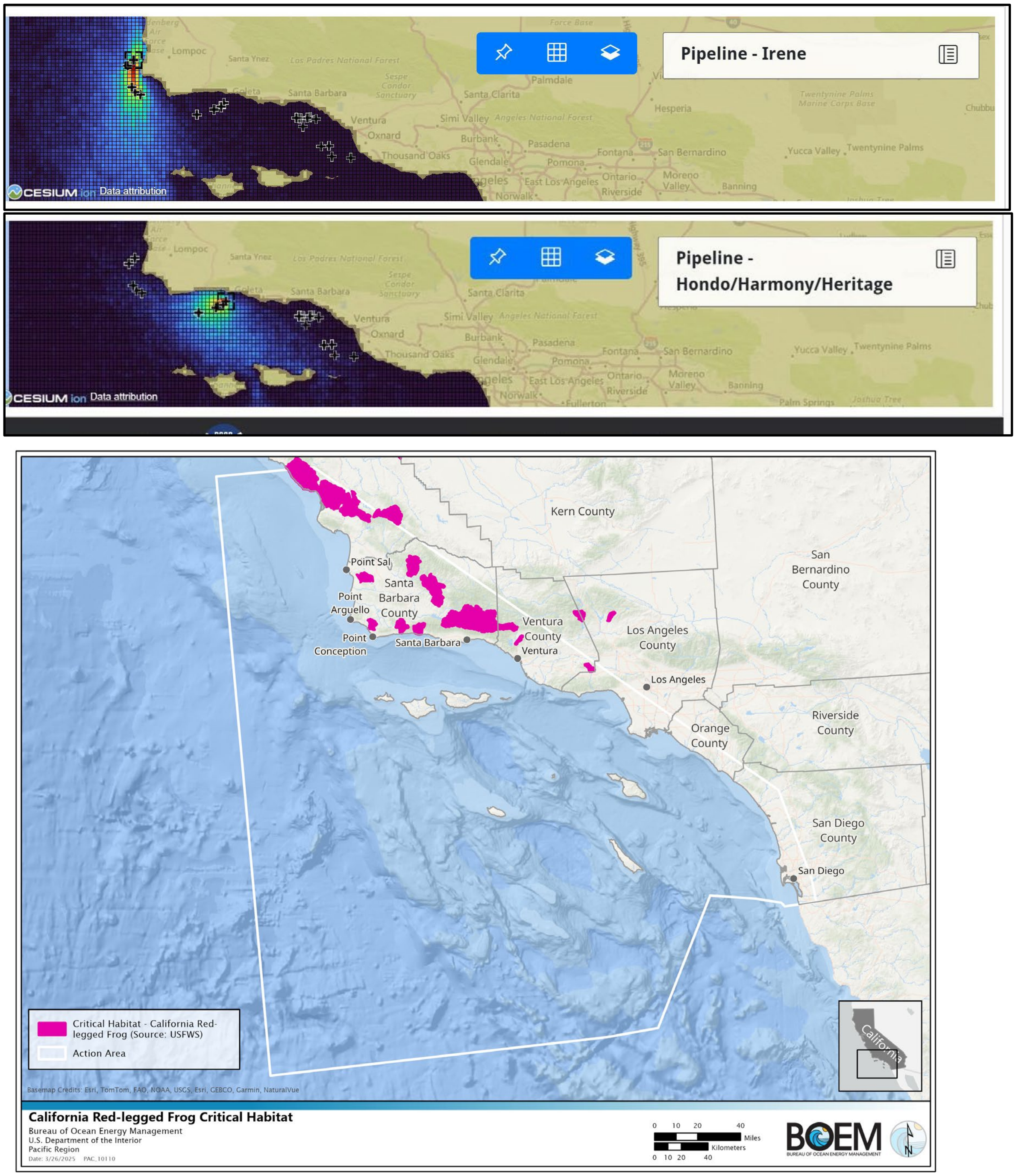

Figure 16. Two TAP model outputs applicable to California red-legged critical habitat.
Top 2 panels: Spill trajectory results for an accidental spill from pipelines in the SCPA (NMFS 2024b).
Lower panel: California red-legged frog critical habitat relative to the action area action area.

6.7.3 Tidewater Goby CH

Tidewater goby CH units have been designated along the coast adjacent to the SCPA (Figure 17). While there are no BOEM/BSEE regulated activities in these units, there is a potential for spilled oil to impact these areas under conditions that allow oil to enter any of these coastal lagoons. The PBF of CH for the tidewater goby are persistent, shallow, still-to-slow-moving lagoons, estuaries, and coastal streams with salinity up to 12 ppt, which provide adequate space for normal behavior and individual and population growth that contain one or more of the following: (a) Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction; (b) Submerged and emergent aquatic vegetation that provides protection from predators and high flow events; or (c) Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity.

The Tidewater Goby CH units range from Arroyo de la Cruz near San Simeon (Unit SLO-1) to the San Luis Rey River near Oceanside (Unit SAN-1; Figure 17). These areas are within the TAP outputs that represent oil spill scenarios if a platform or a pipeline (or series of pipelines) resulted in an oil spill (Figure 11). For example, one of the TAP outputs displays areas of the coastline from the Santa Maria River mouth to Gaviota and the northern Channel Islands that would most likely be affected by an oil spill from Platform Irene pipeline (Figure 11). The TAP analysis for the Irene pipeline displays the highest probability (36%) of oil contacting land at Point Arguello. Spilled oil traveling from Irene pipeline is predicted to go as far north as Cambria (1%). Other sets of TAP outputs include a spill from the pipeline for Platforms Hondo/Harmony/Heritage has a 19–28.5 % chance of hitting land at Gaviota. A spill from the pipeline for Platforms Hillhouse/A/B/C would have a 13–63.5% chance of hitting the shoreline from Santa Barbara to Port Hueneme. A spill from Platform Grace has a 13–26% chance of hitting the mainland from Santa Barbara to Port Hueneme and an 18.5% chance of landing on the eastern end of Anacapa Island. A spill from the pipeline for Edith/Ellen/Eureka has a 14.5–71% chance of hitting the shoreline between the port of LA/Long Beach and Dana Point and a 1% chance of landing on the eastern side of Catalina Island.

Although the Tidewater Goby CHs are found in shallow coastal lagoons, stream mouths, and shallow areas of bays, there is some risk that an oil spill may reach the CH within the coastal lagoons during a high tide or storm when the sand berms blocking the stream mouths from the ocean have been breached. Breaches usually occur during the winter and spring months, and tidewater gobies often move upstream out of the lagoons during this period. If oil spill occurred, oil can become sequestered in the sediments and persist until rains flush the sediments from the lagoon. These lagoons may be oiled from any of the scenarios that are depicted from the TAP outputs mentioned above. OCS data also indicates 63% of probability of an oil spill occurring within the SCPA (Section 6.5.3, Appendix A) which also supports the idea of oil exposing the Tidewater Goby CHs. Therefore, there is a reasonable probability of Tidewater Goby CHs contacting oil and impacting the Tidewater Goby CHs (e.g., PBF (a) Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction; and (b) Submerged and emergent aquatic vegetation that provides protection from predators and high flow events). Oil exposure to the CHs may also reduce the conservation function of the designated CH units. Additionally, impacts to the Tidewater Goby CHs could be exacerbated by beach cleanup efforts by having human activity interacting with their habitat. The level of impacts, however, would be dependent on the volume of oil that reached their habitat and the amount of weathering and mixing the oil had undergone before reaching the habitat. Although oil spill prevention, detection, and response measures limit impacts to Tidewater Goby CHs, we expect reasonable probability of an oil spill to reach the Tidewater Goby CHs and determined that indirectly, the proposed actions **may affect and are likely to adversely affect** the Tidewater Goby.

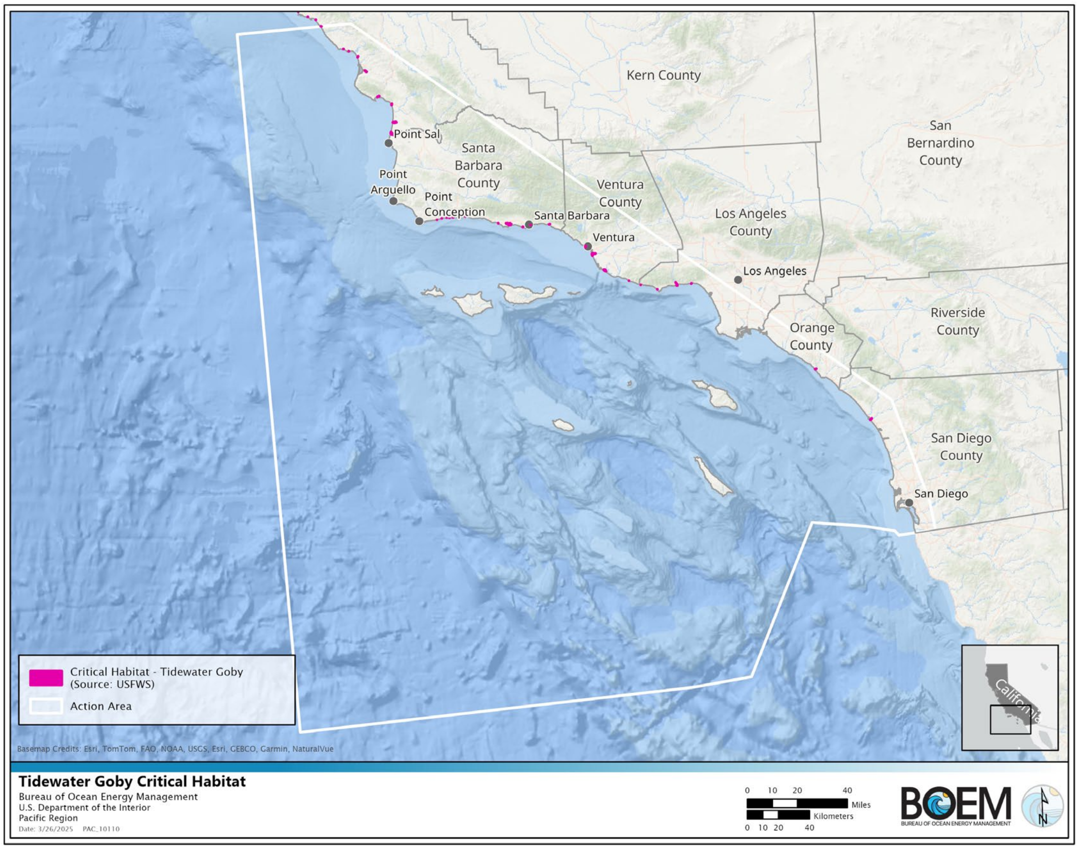

Figure 17. Tidewater goby CH locations in the action area.
12 units in San Luis Obispo County, 12 units in Santa Barbara County, 4 in Ventura County, 4 in Los Angeles County, 1 in Orange County, and 1 in San Diego County

7 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation [50 CFR 402.02 and 402.17(a)]. Future Federal actions that are unrelated to the proposed action are not considered in this section, because they require separate consultation pursuant to section 7 of the ESA.

We did not identify additional state or private activities that are reasonably certain to occur within the action area, do not involve Federal activities (including permitting), and could result in cumulative effects to ESA-listed species and designated CH within the action area. Activities that may occur in these areas will likely consist of actions related to ocean use policy and management of public resources, such as energy development that includes offshore wind and other spatial planning/management projects. However, none of these potential state, local, or private actions, can be anticipated with any reasonable certainty in the action area at this time, and most actions in marine waters would likely involve federal involvement (e.g., permitting) of some type.

8 Conclusion: Table of Determinations

Table 6. Summary of BOEM's determinations for USFWS ESA listed species and CHs that the ongoing proposed action in the action area may affect.

LAA = may affect and likely to adversely affected
NLAA = may affect but not likely to adversely affected
N/A indicates CH was not designated as of 2025.

ESA Listed Species	ESA Status	Species Determination	CH Determination
Southern Sea Otter	Threatened	LAA	N/A
California Least Tern	Endangered	LAA	N/A
Western Snowy Plover	Threatened	LAA	LAA
Light-footed Ridgway's Rail	Endangered	LAA	N/A
Marbled Murrelet	Threatened	LAA	N/A
Short-tailed Albatross	Endangered	NLAA	N/A
Hawaiian Petrel	Endangered	NLAA	N/A
California Red-legged Frog	Threatened	NLAA	NLAA
Tidewater Goby	Endangered	LAA	LAA
Salt Marsh Bird's-Beak	Endangered	LAA	N/A

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Appendix A: Pacific Outer Continental Shelf Region Programmatic Oil Spill Risk Analysis

This appendix covers oil spill risk, fate of oil, trajectory analysis, and response.

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A-1: Oil Spill Risk Assessment and Methods

In normal, day-to-day platform operations, accidental discharges of hydrocarbons may occur. Such accidents are typically limited to discharges of quantities of less than one barrel (bbl) of crude oil. From 1963 to 2022, 1,451 oil spills were recorded. The total volume of oil spilled in the Pacific Region is dominated by the 1969 Santa Barbara Spill (80,900 bbl) which occurred soon after production began. During 1970–2022, there were 1,449 oil spills with an average volume of 1 bbl/spill and a total volume of 1,508 bbl, which represents less than 2% of the volume spilled in 1969.

The largest spill during 1970–2022 was the 588 bbl Beta Unit spill ("Huntington Beach" spill) in October 2021 from Amplify Energy Corporation's San Pedro pipeline P00547 (Table A-1). In a settlement agreement (Case No. 8:21-cv-01628-DOC-JDE, Document 476-4, U.S. District Court for the Central District of California, 2022), the corporate defendants asserted that the spill was a result of severe damage to pipeline P00547 from two container ships that repeatedly dragged their anchors across it. Without accepting responsibility, the shipping companies agreed to contribute funds to the remediation process.

The next six largest spills were (in descending order of size; Table A-1): 164 bbl in 1997 due to a pipeline break in the flange metal in State waters due to welding flaws; 150 bbl in 1996 due to equipment failure and error allowing emulsion to flow through flare boom; 101 bbl in 1990 from mineral oil mud released due to incorrectly positioned standpipe and closed valves; 50 bbl in

1994 due to process upset resulting in overflow of oil/water emulsion from tanks into disposal tube; and 50 bbl in 1991 after a pipeline riser ruptured when snagged by grappling hook used by workboat to retrieve a lost anchor. The source of oil spilled in 2012 (35.78 bbl; Table A-1) was primarily from Platform Houchin caused by a burst plate (35 bbl, per USCG).

The oil spill risk in the "50 to 1,000 bbl" range was calculated for the Pacific Region using historic oil spill data (1963–2022) and cumulative production from the Pacific Region. BOEM estimated the number of oil spills and the probability of one or more spills that could occur as a result of ongoing activities in the Southern California Planning Area in the "50 to 1,000 bbl" size range using Pacific Region oil spill rates (Table A-2). Oil spill rate is calculated as a function of the volume of oil handled or the amount of oil that could be exposed. Oil exposed is defined as the volume of oil produced or transported within a given area. Therefore, the total amount of oil that could be economically produced in the Southern California Planning Area was used as this exposure variable. In the "50 to 1,000 bbl" size range we estimate there will be 1 spill with a 63% probability of an oil spill occurring (Table A-2). The probability of an oil spill occurring decreases with the decreasing amount of oil left to be produced. Note that the 80,900 bbl 1969 spills were not included in this calculation, since they do not fall within the "50 to 1,000" bbl size range for spill probability calculations; a spill of this size is an extreme event and not reasonably foreseeable.

For comparison, we calculated oil spill probabilities using oil spill rates derived from all United States Outer Continental Shelf (US OCS) operations (1996–2010) and the total amount of oil that could be economically produced in the Southern California Planning Area (Anderson et. al. 2012). Using spill rates based on all US OCS Operations (1996–2010), the probability of one or more spills occurring in the Pacific Region for the "50 to 1,000 bbl" size range is 95%. The lower probability (63%) of spills in the "50 to 1,000 bbl" size range using POCSR oil spill data reflects the lower number of oil spills throughout POCSR production history.

The probability of one or more spills occurring in the greater than 1,000 bbl size range is 7% (Table A-2). This is a conservative estimate calculated using the same methodology as for the "50 to 1,000 bbl" range and based on all US OCS operations (1996–2010). For the greater than 1,000 bbl size range, we did not calculate oil spill rates with only POCSR data due to the limited dataset (2 spills > 1,000 bbl occurred in 1969). A spill of this size would be an unlikely event in the POCSR.

Table A-1: Number and volume (in barrels, bbl) of crude, diesel, or other hydrocarbon spills recorded in the POCSR, 1963–2022, shown for three size categories of spills: 1) less than or equal to 1 bbl, 2) greater than 1 but less than 50 bbl, 3) greater than or equal to 50 bbl.

Year	# Spills ≤ 1 bbl	Vol. spills ≤ 1 bbl	# Spills 1–50 bbl	Vol. spills 1–50 bbl	# Spills ≥ 50 bbl	Vol. spills ≥ 50 bbl	**Total # spills**	**Total volume**	**Cumulative vol. 1970–2022**
1963	0	0.00	0	0.00	0	0.00	**0**	**0.00**	
1964	0	0.00	0	0.00	0	0.00	**0**	**0.00**	
1965	0	0.00	0	0.00	0	0.00	**0**	**0.00**	
1966	0	0.00	0	0.00	0	0.00	**0**	**0.00**	
1967	0	0.00	0	0.00	0	0.00	**0**	**0.00**	
1968	0	0.00	0	0.00	0	0.00	**0**	**0.00**	
1969	**0**	**0.00**	**0**	**0.00**	**2**	**80,900.00**	**2**	**80,900.00**	
1970	0	0.00	0	0.00	0	0.00	**0**	**0.00**	**0.00**
1971	0	0.00	0	0.00	0	0.00	**0**	**0.00**	**0.00**
1972	0	0.00	0	0.00	0	0.00	**0**	**0.00**	**0.00**
1973	0	0.00	0	0.00	0	0.00	**0**	**0.00**	**0.00**
1974	0	0.00	0	0.00	0	0.00	**0**	**0.00**	**0.00**
1975	1	0.10	0	0.00	0	0.00	**1**	**0.10**	**0.10**
1976	3	1.10	1	2.00	0	0.00	**4**	**3.10**	**3.20**
1977	11	2.20	1	4.00	0	0.00	**12**	**6.20**	**9.40**
1978	4	1.20	0	0.00	0	0.00	**4**	**1.20**	**10.60**
1979	5	1.70	1	2.00	0	0.00	**6**	**3.70**	**14.30**
1980	11	4.90	2	7.00	0	0.00	**13**	**11.90**	**26.20**
1981	21	6.00	10	75.00	0	0.00	**31**	**81.00**	**107.20**
1982	24	3.20	1	3.00	0	0.00	**25**	**6.20**	**113.40**
1983	56	7.70	3	6.00	0	0.00	**59**	**13.70**	**127.10**
1984	65	4.70	3	36.00	0	0.00	**68**	**40.70**	**167.80**
1985	55	9.30	3	9.00	0	0.00	**58**	**18.30**	**186.10**
1986	39	5.50	3	12.00	0	0.00	**42**	**17.50**	**203.60**
1987	67	7.50	2	11.00	0	0.00	**69**	**18.50**	**222.10**
1988	47	3.70	1	2.00	0	0.00	**48**	**5.70**	**227.80**
1989	69	4.10	3	8.33	0	0.00	**72**	**12.43**	**240.23**
1990	43	2.70	0	0.00	1	101.00	**44**	**103.70**	**343.93**
1991	51	2.80	1	13.00	1	50.00	**53**	**65.80**	**409.73**
1992	39	1.20	0	0.00	0	0.00	**39**	**1.20**	**410.93**
1993	32	0.76	0	0.00	0	0.00	**32**	**0.76**	**411.69**
1994	18	0.40	2	33.00	1	50.00	**21**	**83.40**	**495.09**
1995	25	0.90	1	1.43	0	0.00	**26**	**2.33**	**497.42**
1996	39	0.90	1	5.00	1	150.00	**41**	**155.90**	**653.32**
1997	20	1.50	0	0.00	1	164.00	**21**	**165.50**	**818.82**
1998	29	1.00	0	0.00	0	0.00	**29**	**1.00**	**819.82**
1999	26	1.35	1	10.00	0	0.00	**27**	**11.35**	**831.17**
2000	36	1.00	0	0.00	0	0.00	**36**	**1.00**	**832.17**
2001	48	1.70	0	0.00	0	0.00	**48**	**1.70**	**833.87**
2002	55	1.30	1	9.00	0	0.00	**56**	**10.30**	**844.17**
2003	56	1.37	0	0.00	0	0.00	**56**	**1.37**	**845.54**
2004	36	1.00	0	0.00	0	0.00	**36**	**1.00**	**846.54**
2005	46	2.60	0	0.00	0	0.00	**46**	**2.60**	**849.14**
2006	46	1.99	0	0.00	0	0.00	**46**	**1.99**	**851.13**
2007	45	1.19	1	1.19	0	0.00	**46**	**2.38**	**853.51**
2008	45	1.20	1	27.00	0	0.00	**46**	**28.20**	**881.71**
2009	36	1.10	0	0.00	0	0.00	**36**	**1.10**	**882.81**
2010	33	0.63	0	0.00	0	0.00	**33**	**0.63**	**883.44**
2011	38	0.02	0	0.00	0	0.00	**38**	**0.02**	**883.46**
2012	30	0.08	1	35.70	0	0.00	**31**	**35.78**	**919.24**
2013	26	0.03	0	0.00	0	0.00	**26**	**0.03**	**919.27**

Year	# Spills ≤ 1 bbl	Vol. spills ≤ 1 bbl	# Spills 1–50 bbl	Vol. spills 1–50 bbl	# Spills ≥ 50 bbl	Vol. spills ≥ 50 bbl	**Total # spills**	**Total volume**	**Cumulative vol. 1970–2022**
2014	10	0.48	0	0.00	0	0.00	**10**	**0.48**	**919.75**
2015	13	0.11	0	0.00	0	0.00	**13**	**0.11**	**919.86**
2016	0	0.00	0	0.00	0	0.00	**0**	**0.00**	**919.86**
2017	0	0.00	0	0.00	0	0.00	**0**	**0.00**	**919.86**
2018	0	0.00	0	0.00	0	0.00	**0**	**0.00**	**919.86**
2019	0	0.00	0	0.00	0	0.00	**0**	**0.00**	**919.86**
2020	0	0.00	0	0.00	0	0.00	**0**	**0.00**	**919.86**
2021	0	0.00	0	0.00	1	588.00	**1**	**588.00**	**1,507.86**
2022	0	0.00	0	0.00	0	0.00	**0**	**0.00**	**1,507.86**
Total	**1,399**	**92.00**	**44**	**313.00**	**8**	**82,003.00**	**1,451**	**82,408.00**	**1,507.86**

Oil spill probability estimates are conservative given POCSR's:

- oil spill history,
- long established drilling program,
- producing from mature fields with lower pressure,
- no floating drilling rigs,
- no new platforms being installed, and
- no oil is transported via vessels.

Table A-2: Estimated spill rate, mean number of oil spills, and spill occurrence probability in the POCSR for 1) 50-1,000 bbl: oil spills with volumes greater than 50 but less than 1,000 bbl, and 2) ≥ 1,000 bbl: oil spills equal to or greater than 1,000 bbl. Numbers are based on oil spill data from POCSR operations (1963–2022) or U.S. OCS Spill Data (1996–2010). Anticipated POCSR production is 0.226 Bbbl (billions of barrels). Spill rate based on methodology from Anderson et al. (2012).

Spill volume (bbl)	Dataset	Years	Structures	Spill rate	Estimated mean # spills	Probability ≥ 1 spill
50–1,000	POCSR	1963-2022	Platforms & Pipelines	4.38	1	63%
50–1,000	U.S. OCS	1996-2010	Platforms & Pipelines	12.88	3	95%
≥ 1,000	U.S. OCS	1996-2010	Platforms	0.25	0.06	3%
≥ 1,000	U.S. OCS	1996-2010	Pipelines	0.88	0.20	4%
≥ 1,000	US OCS	1996-2010	Total	1.13	0.25	7%

Formulae used in the Oil Spill Occurrence and Probability Calculations:

Spill rate λ = number of spills per Bbbl

Estimated Mean Number of Spills = spill rate λ x volume handled t (Bbbl) = λt

Probability [n spills over future exposure t] = $[(\lambda t)^n e^{-\lambda t}] / n!$

Probability of Zero Spills = $[(\lambda t)^0 e^{-\lambda t}] / 0! = [1 \times e^{-\lambda t}] / 1 = e^{-\lambda t} = 1 / e^{\lambda t}$

Probability of One or More Spills = 1-Probability[zero spills] = $1 - 1 / e^{\lambda t}$

A-1.1 Oil Spill Assessment 1970s and 1980s

The 1975 Environmental Impact Statement (EIS) for Oil Development in the Santa Barbara Channel estimated 1 to 2 billion barrels (Bbbl) of oil would be produced (USGS 1975). To date the Southern California Planning area has produced 1.37 Bbbl of oil with a remaining production estimate of 0.2256 Bbbl. Therefore, the production estimates for the region are within what was estimated in the 1975 EIS. This section reviews, by geographic location, the oil spill assessments completed in the 1970s and 1980s environmental documents. This information is provided to support the discussion of the current status of the species, to provide background on previous determinations of effects to threatened and endangered species, to boost confidence in BOEM's current calculations, and to serve as a comparison with current estimates.

Santa Barbara Channel:

USGS 1975 EIS: estimated a 70% chance that there would be at least one platform spill of 1,000 bbl, and if a large platform spill occurred, there was an 80% chance the spill would exceed 2,380 bbl (USGS 1975). (Platforms covered: Hogan, Houchin, Hillhouse, A, B, C, Henry, Grace, Habitat)

1980 Environmental Impact Report–Environmental Assessment (EIR-EA) for the Platform Gina and Gilda development: estimated that an average rate of operational platform spills is 1 spill per production platform per 10.6 years (Dames and Moore, 1980). Thus, it was estimated that Platform Gilda would have 1.9 spills over the 20-year production lifetime. (Platforms covered: Gina, Gilda)

1986 Platform Gail Environmental Assessment (EA): cumulative oil spill analysis estimated that during 32 years of production in the Southern California Planning Area there would be 14.5 spills ≥ 1,000 bbl and 6.6 spills ≥ 10,000 bbl (MMS 1986). (Platforms covered: Gail)

1984 Santa Ynez Unit Environmental Impact Report/ Environmental Impact Statement (EIR/EIS) examined spills ranging from 10 bbl to more than 500,000 bbl and categorized a platform blowout as spilling between 1,000 and 500,000 bbl (SAI 1984). (Platforms covered: Hondo, Harmony, Heritage[8], and a fourth platform that was never installed)

1984 Point Arguello EIR/EIS estimated that a cumulative total of 144,000 bbl of oil would be expected to be spilled over a 30-year project lifetime (ADL 1984; Appendix H). (Platforms covered: Hildalgo, Harvest, Hermosa)

Spills since 1969, ≥ 50 bbl:

- Platform Habitat: 1990—100 bbl of drilling mud with mineral oil
- Platform Gina: 1991—50 bbl of oil from a broken pipeline
- Platform Hogan: 1994—50 bbl of oil
- Platform Heritage: 1996—150 bbl of oil

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[8] A fourth platform was also covered by this document, but never installed. The platform has since been removed from the current Development and Production Plan for the Santa Ynez Unit.

San Pedro Bay:

1978 Beta Unit EIR-EA analyzed the following spills: 5000-bbl platform spill, 50-bbl pipeline spill, 50-bbl Long Beach Harbor spill, and a catastrophic 80,000-bbl platform spill (SLC, PLB, USGS 1978). (Platforms covered: Elly, Ellen, Eureka, Edith)

- Beta Unit: 2021—588 bbl pipeline spill

Santa Maria Basin:

1985 Santa Maria Basin EIS/EIR analyzed oil spills ranging from 10 to 100,000 bbl (ADL 1985). (Platforms covered: Irene)

Spills since 1969:

- Platform Irene: 1997—164 bbl pipeline spill

A-1.2 **Worst Case Discharge**

Pacific OCS Region operators are required to submit oil spill response plans (OSRPs) which show the worst case volume of oil that could be spilled from three sources associated with offshore operations: vessels, tanks, and piping on board platforms, pipelines, and loss of well control events (Table A-3; 30 CFR 254; 30 CFR 550). These plans are not authorized by BSEE and therefore not part of this consultation Alaska Wilderness League v. Jewell, 788 F.3d 1212, 1224-25; 9th Cir. 2015). The intent of this conservative requirement is to ensure that each operator has adequate spill response capabilities to respond to the largest conceivable oil spill from their facilities. If surface intervention is unsuccessful, an operator needs to mobilize a drilling rig to the Southern California Planning Area and drill a relief well. The largest worst case discharge volume is calculated as the release of stored oil on a platform, oil in the associated pipeline, plus the total flow released from a loss of well control up to the drilling of a relief well. The worst-case discharge volumes vary significantly across facilities. A continuous spill event (i.e., from a loss of well control) is more difficult to quantify but unlikely to occur given the reservoir pressures in the POCSR (13 of the 23 platforms have no pressure; Table A-3).

Worst Case Discharge Scenario, Largest Volume in POCSR

Platform Heritage, Santa Ynez Unit, located approximately 8 miles offshore Gaviota, California, has the largest worst case discharge estimate for a loss of well control (blowout) with an estimated maximum daily flow rate of 33,986 bbl. It is estimated to take 17 days to stop the flow using surface capping equipment, for a total discharge volume of 577,762 bbl. If surface intervention is not achieved, the estimated maximum time it would take to mobilize a rig and drill a relief well would be 170 days, with a total discharge volume of 5,777,620 bbl. This would be a catastrophic event that is not reasonably certain to occur.

A-1.3 **Summary of Oil Spill Risk Assessment**

- This assessment assumed a maximum spill of 1,000 bbl at a rate of 200 bbl per day for 5 days.
- The probability of an oil spill occurring in the 50 to 1,000 bbl range is 63%.
- Projected oil production in the Southern California Planning Area is within what was analyzed in the environmental documents from the 1970s and 1980s.
- A large catastrophic event is not reasonably certain to occur.

Table A-3: Worst case discharges identified in Oil Spill Response Plans (OSRPs) in POCSR.

Facility	Pipeline (bbl)	Storage[1] (bbl)	Drilling (bbl/day)	Reference
Hogan	Pipeline to Shore = 41 (oil + water) Inter-Platform (Houchin) = 49	324	0	Pacific Operators Offshore OSRP 2012
Houchin	See Information for Hogan	324	0	Pacific Operators Offshore OSRP 2012
Elly	16" Pipeline Elly to Beta Pump Station = 3,111	8,925	0 (no drilling)	Beta Unit Complex OSRP 2012
Ellen	No Pipeline, transfers through Elly = 0	1840	45	Beta Unit Complex OSRP 2012
Eureka	Pipeline = 1,026	4,232	105	Beta Unit Complex OSRP 2012
Gail	Pipelines at Gail = 168	2,068	650	Santa Clara Unit OSRP 2012
Grace	Pipelines at Grace and Grace to Shore = 292	1,557	110	Santa Clara Unit OSRP 2012
Hermosa	Pipeline Hermosa to Shore = 2,502	3,760	0	Plains Exploration and Production Company OSRP 2012
Hildalgo	Pipeline Hildalgo to Hermosa = 489	2,478	0	Plains Exploration and Production Company OSRP 2012
Harvest	Pipeline Harvest to Hermosa = 221	3,820	0	Plains Exploration and Production Company OSRP 2012
Irene	Pipeline Irene to Shore = 1,124	1,064	750	Plains Exploration and Production Company OSRP 2012
Gilda	Pipeline Gilda to Shore = 1,994	857	200	DCOR OSRP 2012
Gina	Pipeline Gina to Shore = 546	223	0	DCOR OSRP 2012
"C"	Pipeline C to B = 11	306	2	DCOR OSRP 2012
"B"	Pipeline B to A = 92	646	0	DCOR OSRP 2012
"A"	Pipeline A to Shore = 3,685	589	0	DCOR OSRP 2012
Hillhouse	Pipeline Hillhouse to A = 57	1,534	0	DCOR OSRP 2012
Henry	Pipeline Henry to Hillhouse = 3	118	0	DCOR OSRP 2012
Edith	Pipeline Edith to Elly = 122	2,352	0	DCOR OSRP 2012
Habitat	No Pipeline, gas production	385	0	DCOR OSRP 2012
Harmony	Pipeline Harmony to Shore = 6,210	2,607	< 2,000	ExxonMobil OSRP 2014
Heritage	Pipeline Heritage to Harmony = 731	2,684	33,986	ExxonMobil OSRP 2014
Hondo	Pipeline Hondo to Harmony = 560	3,811	< 2,000	ExxonMobil OSRP 2014

[1] Vessels, piping, tanks

A-2: Fate of Oil

In the event of an accidental oil spill, a slick forms and part of the slick begins evaporating while the action of breaking waves forms oil droplets that are dispersed into the water column. Oil in the Southern California Planning Area ranges from very heavy (API 12) to very light (API 39). Light oil has a rapid evaporation rate and is soluble in water. Light crude oils can lose up to 75% of their initial volume within a few days of a spill (NRC 2003). In contrast, heavy oil (API < 22) has a negligible evaporation rate and solubility in water.

Depending on the weight of the oil spilled and the environmental conditions (i.e., sea state) at the time of a spill, 6 to 60% of oil during an oil spill would sink and be in the water column or on the seafloor in the vicinity of the spill (ADL 1984). This is supported by a study of natural oil seeps at Coal Oil Point in the Santa Barbara Channel that range in depth from six to 67 meters offshore of Goleta, CA (Leifer et al. 2006) and are assumed to release 100 bbl/day (Farwell et al. 2009). The distribution of heavy oil in a surface slick in the Santa Barbara Channel is primarily influenced by surface currents and falls out of the slick over a period of 0.4 to 5 days (Leifer et al. 2006).

A-3: Oil Spill Response

BSEE regulations at 30 CFR Part 254 require that each OCS facility have a comprehensive Oil Spill Response Plan (OSRP). These plans are not subject to Federal approval and thus not included as part of this consultation (Alaska Wilderness League v. Jewell, 788 F.3d 1212, 1224-25; 9th Cir. 2015). Response plans consist of an emergency response action plan and supporting information that includes an equipment inventory, contractual agreements with subcontractors and oil spill response cooperatives, worst-case discharge scenario, dispersant use plan, in-situ burning plan and details on training and drills. The Coast Guard is the lead response agency for oil spills in the coastal zone and coordinate the response using a Unified Command (UC), consisting of the affected state and the Responsible Party (i.e., the company responsible for spilling the oil) in implementing the Incident Command System (ICS) if an oil spill occurs. Oil spill drills, either agency-lead or self-lead by a company, also use the UC/ICS. California's Office of Spill Prevention and Response (OSPR) assumes the role of the State on-scene coordinator and plays a significant role in managing wildlife operations in the Southern California Planning Area as the state's Natural Resource Agency.

BSEE requires companies that operate in the OCS to have the means to respond to a worst-case discharge from their facilities. Companies meet this requirement by becoming members of Oil Spill Removal Organizations (OSRO).

The Marine Spill Response Corporation (MSRC) is the U.S. Coast Guard-classified OSRO based in Long Beach (www.msrc.org). MSRC is a nation-wide OSRO with multiple responder-class oil spill response vessels and oil spill response barges. They are also equipped to respond to an oil spill 24 hours a day.

MSRC is equipped and prepared to respond to oil spill threats to sensitive shoreline areas through the detailed and up-to-date information on sensitive areas and response strategies from the Los Angeles/Long Beach Area Contingency Plan (https://www.wildlife.ca.gov/OSPR/Preparedness/LA-LB-Spill-Contingency-Plan) and the California OSPR (https://www.wildlife.ca.gov/OSPR).

A-4: OIL SPILL TRAJECTORY ANALYSIS

Oil spill trajectory modeling was conducted to determine the movement and fate of spilled oil if a spill occurred in the Southern California Planning Area from existing offshore oil and gas operations. BOEM collaborated with the National Oceanic & Atmospheric Administration (NOAA) Office of Response & Restoration to create a Trajectory Analysis Planner (TAP) for the Southern California Planning Area. A regional TAP involves the development of a database created by analyzing statistics from a large number of simulated spill trajectories. These trajectories were run using the General NOAA Operational Modeling Environment (GNOME) (Zelenke et al. 2012; NOAA 2015) with forcing from a high-resolution (1 km) Regional Ocean Modeling System (ROMS; Shchepetkin and McWilliams 2005) hindcast. This extensive model output allows modeling of realistic oil spill scenarios over a range of different regional oceanographic regimes (such as upwelling, relaxation, and eddy-driven flow). Modeled spills were started at the locations of Federal offshore oil and gas operations in southern California. A maximum hypothetical spill of 1,000 bbl was simulated from each location using a spill rate of 200 bbl per day over 5 days.

The visualizations of the modeled spills can be accessed online through the web-based TAP viewer (https://tap.orr.noaa.gov/#locations/south-california/impact_analysis). Users can select features of the model's output for graphic display, including spill source (platform or pipeline) time since start, and level of concern. Figure A-1 shows one example of trajectory analysis results generated by the model. Figure A-2 shows the combined trajectory model results from multiple spill sources. It represents the full extent of areas that could be affected by the estimated maximum spill size (1,000 bbl).

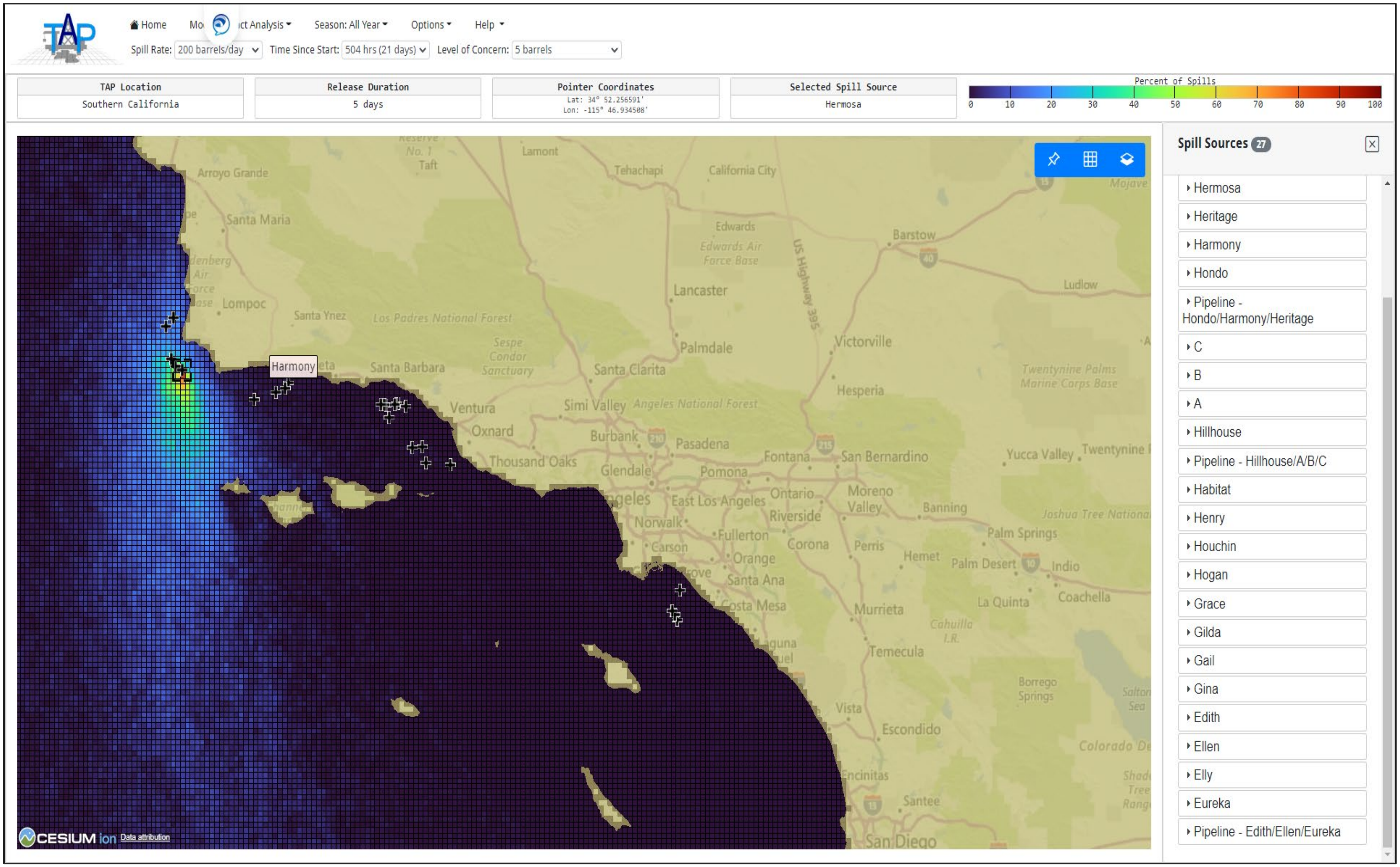

Figure A-1: Example graphic visualization of model results from Trajectory Analysis Planner (TAP) for the Southern California Planning Area.
https://tap.orr.noaa.gov/#locations/south-california/impact_analysis

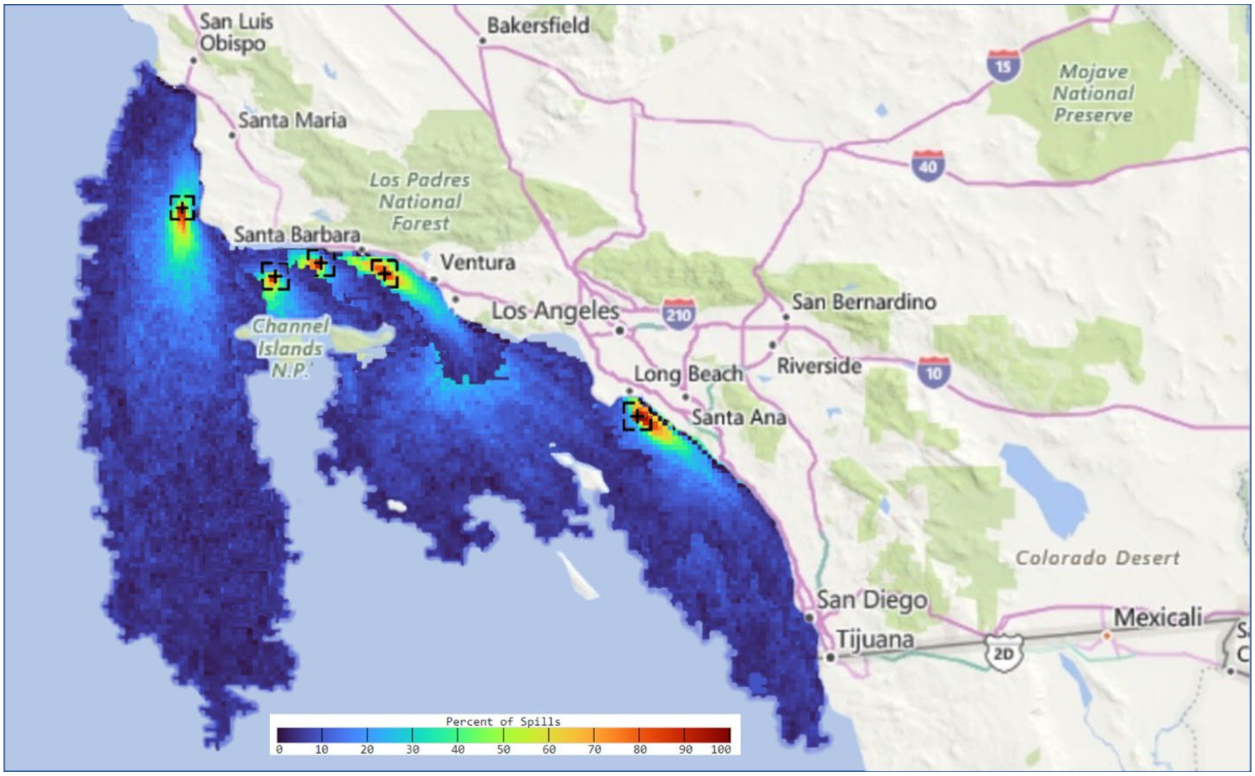

Figure A-2: Combined spill trajectory model results.
Areas with colors represented on the color scale had greater than approximately 10 percent of modelled spills resulting in accumulation of 5 bbl or more by 21 days since the maximum spill occurrence (200 bbl per day for 5 days).

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Appendix B: Supplemental Information on the Action Area and Impacts

B.1. Platforms and lease blocks

Table B-1. Platforms on the POCS (reproduced from BOEM 2024: Table 1-1)
[a] Lease associated with the platform has been terminated and is no longer active.

Platform	Date Installed	Location	Water Depth m (ft)	Distance from Shore km (mi)
Tranquillon Ridge Field				
Irene	8-7-1985	Santa Maria Basin	74 (242)	7.6 (4.7)
Point Arguello Field				
Harvest[a]	6-12-1985	Santa Maria Basin	204 (675)	10.8 (6.7)
Hermosa[a]	10-5-1985	Santa Maria Basin	184 (603)	10.9 (6.8)
Hidalgo[a]	7-2-1986	Santa Maria Basin	131 (430)	9.5 (5.9)
Hondo Field				
Hondo	6-23-1976	Santa Barbara Channel West	257 (842)	8.2 (5.1)
Harmony	6-21-1989	Santa Barbara Channel West	365 (1,198)	10.3 (6.4)
Pescado Field				
Heritage	10-7-1989	Santa Barbara Channel West	328 (1,075)	13.2 (8.2)
Carpinteria Offshore				
Houchin[a]	7-1-1968	Santa Barbara Channel East	50 (163)	6.6 (4.1)
Hogan[a]	9-1-1967	Santa Barbara Channel East	47 (154)	6.0 (3.7)
Henry	8-31-1979	Santa Barbara Channel East	53 (173)	6.9 (4.3)
Dos Cuadras Field				
Hillhouse	11-26-1969	Santa Barbara Channel East	58 (190)	8.8 (5.5)
A	9-14-1968	Santa Barbara Channel East	57 (188)	9.3 (5.8)
B	11-8-1968	Santa Barbara Channel East	58 (190)	9.2 (5.7)
C	2-28-1977	Santa Barbara Channel East	59 (192)	9.2 (5.7)
Pitas Point Field				
Habitat[a]	10-8-1981	Santa Barbara Channel East	88 (290)	12.6 (7.8)
Gilda	1-6-1981	Santa Barbara Channel East	62 (205)	14.2 (8.8)
Grace[a]	7-30-1979	Santa Barbara Channel East	97 (318)	16.9 (10.5)
Sockeye Field				
Gail[a]	4-5-1987	Santa Barbara Channel East	225 (739)	15.9 (9.9)
Hueneme Field				
Gina	12-11-1980	Santa Barbara Channel East	29 (95)	6.0 (3.7)
Beta Field				
Edith	1-12-1984	San Pedro Bay	49 (161)	13.7 (8.5)
Elly	3-12-1980	San Pedro Bay	78 (255)	13.8 (8.6)
Ellen	1-15-1980	San Pedro Bay	81 (265)	13.8 (8.6)
Eureka	7-8-1984	San Pedro Bay	213 (700)	14.5 (9.0)

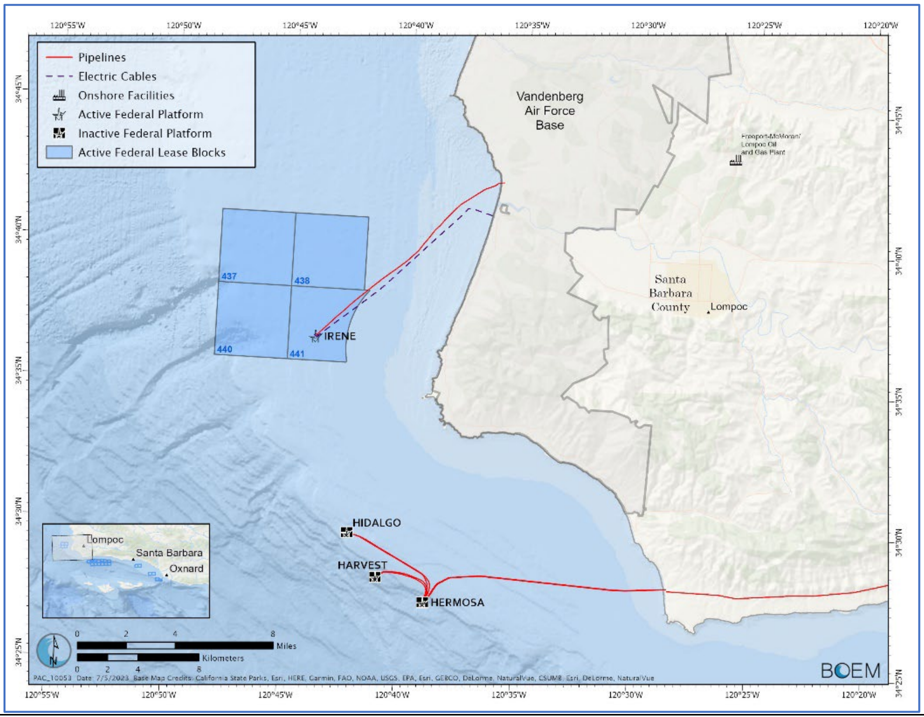

Figure B-1. Locations of platforms, pipeline, and power cables and associated lease blocks in the Santa Maria Basin in the northwestern portion of the Southern California Planning Area.

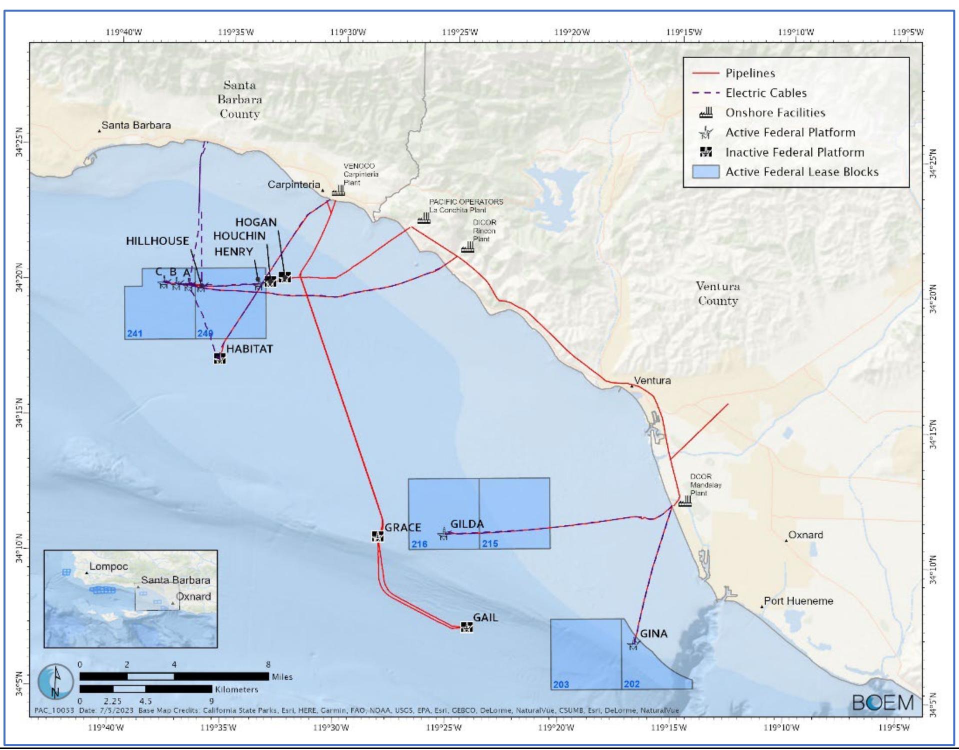

Figure B-2. Locations of platforms, pipeline, and power cables and associated lease blocks in the Santa Barbara Channel in the central portion of the Southern California Planning Area.

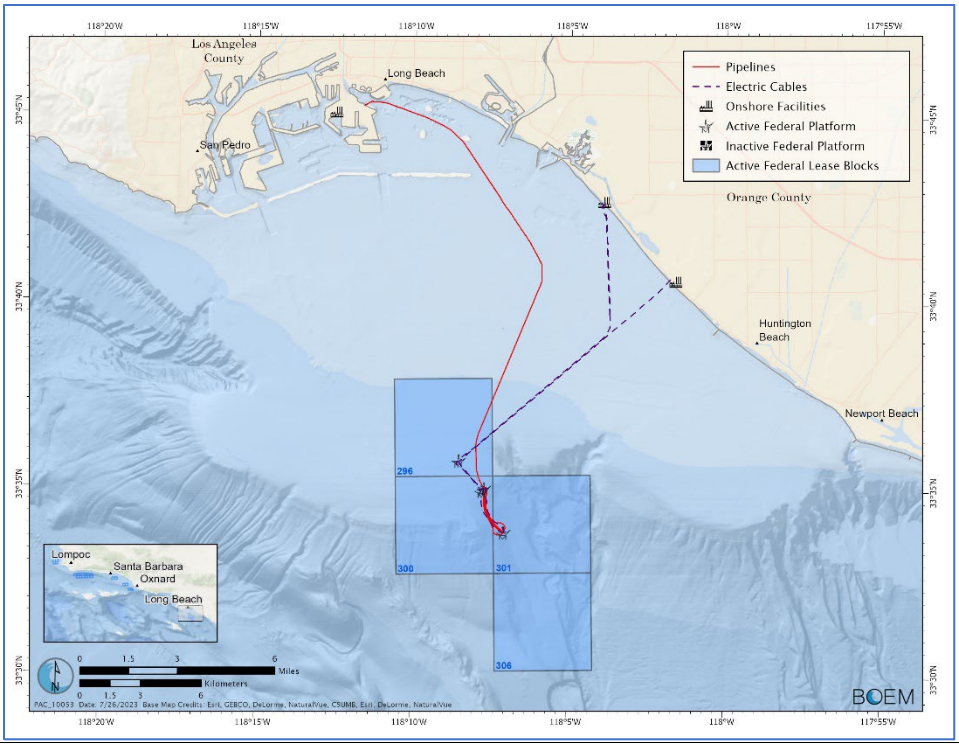

Figure B-3. Locations of platforms, pipeline, and power cables and associated federal lease blocks in the San Pedro Bay at the southeastern end of the Southern California Planning Area.

B.2. Species Affected by the 2021 Huntington Beach Oil Spill

Table C-1. Numbers of live and dead bird and mammals found after the Huntington Beach oil spill. Live birds were visibly oiled. Not all dead animals were visibly oiled (UC Davis 2021).

Bird Species	# Live	# Dead
Acorn Woodpecker	0	1
American Coot	1	4
Black-Crowned Night Heron	0	1
Black-legged Kittiwake	0	1
Black-vented Shearwater	0	2
Brandt's Cormorant	0	12
Brown Pelican	1	1
Buller's Shearwater	0	1
Cackling Goose	0	1
California Gull	3	2
Clark's Grebe	1	0
Double-Crested Cormorant	1	0
Duck sp.	0	2
Eared Grebe	1	7
Falcon sp.	0	1
Grebe sp.	0	1
Gull sp.	0	3
Herman's Gull	0	1
Northern Fulmar	1	4
Pelagic Cormorant	0	2
Pigeon sp.	0	1
Red-Footed Booby	0	1
Rock Pigeon	0	4
Ruddy Duck	1	0
Sanderling	5	0
Shearwater sp.	0	4
Snowy Plover	7	0
Sooty Shearwater	0	1
Spotted Towhee	0	1
Surf Scoter	1	0
Western Grebe	8	6
Western/Clark's Grebe	1	2
Western Gull	2	9
Western Meadowlark	0	2
Whimbrel	0	1
Undetermined	0	3
TOTAL BIRDS	**34**	**82**

Mammal Species	# Live	# Dead
Bottlenose Dolphin	0	1
California Sea Lion	0	3
Northern Right Whale Dolphin	1	0
Unidentified Pinniped	0	1
Unidentified Mammal	0	1
TOTAL MAMMALS	**1**	**6**

B.3. Noise

B.3.1 Acoustic Thresholds for Impulsive Sounds

BOEM uses whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds are also considered.

B.3.2 Sound Pressure

Underwater peak sound pressure (*L*pk) has a reference value of 1 μPa, and cumulative sound exposure level (*L*E) has a reference value of 1 $\mu Pa^2 s$. Airborne sound is referenced to: 20 μPa^2 s The μPa subscript “flat” is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle).

dB(A) is the A-weighted sound level for frequencies most sensitive for human beings

B.4. Lighting

Nocturnal oceans are flat, dark environments where many seabirds are nocturnally active to avoid avian predators, primarily gulls (Montevecchi 2006). Artificial light effects include disorientation, mortality due to collisions with lighted structures, and interruption of natural behaviors (Harder 2002; Schaar 2002, Rich and Longcore 2006). Birds that spend most of their lives at sea are often highly influenced by artificial lighting in coastal areas and dark ocean environments. Intense source points of artificial lighting on the ocean can attract marine birds from very large catchment areas (Rodhouse et al. 1987, Wiese et al. 2001). The species that are potentially the most vulnerable to attraction to artificial lighting in marine environments are nocturnal species that are at risk and endangered and whose populations are small and fragmented (Montevecchi 2006).

Gauthreaux and Belser (2006) suggest that night-migrating birds showed “nonlinear flight” near towers with white and red strobe lights; however, they also stated that the attraction may have been more attributable to the constant tower lighting with the red strobe lights. Poot et al. (2008) found that white and red light interfere with the magnetic compass of migrating birds, where they caused disorientation at low light intensity, compared to a high-intensity green light that caused less disorientation. The researchers concluded that the disorientation is due to the wavelength; green and blue lights have a short wavelength resulting in very little observable impact to birds’ orientation. In 2007, lights on gas production platform L15 in the North Sea were replaced with green lighting. Based on comparisons to previous assessments of L15, it was concluded that 2–10 times less birds are negatively impacted (circling around the installation for a prolonged period of time) by the new light source as by the original standard white (tube lights) and orange (sodium high pressure lights) lighting (Van de Laar 2007). In addition, the number of birds actually landing on the platform was decreased. The platform is still visible from a distance with the new lighting and the platform crew has commented that the lighting is less blinding, and they have increased contrast vision during crane operations (Poot et al. 2008).

Fledgling storm-petrels, shearwaters, and some alcids are more attracted to artificial lights than are adults. This attraction likely results from disorientation associated with environmental inexperience or possibly from predispositions to find bioluminescent prey at sea (Imber 1975). Some species of petrels and storm-petrels, including several endangered or threatened species, incur considerable fledgling mortality as a result of artificial light attraction (Bretagnolle 1990, Mougeot and Bretagnolle 2000, Day et al. 2003). The varying age-class attraction suggests that older birds may learn not to approach artificial light sources (Montevecchi 2006).

Migratory periods are critical times for mortality associated with artificial lighting at coastal and offshore sources. High proportions of relatively easily disoriented young-of-the-year are on the wing in the autumn and large numbers of seabirds move across oceans and hemispheres during the spring and fall. Podolsky (2002) indicates that artificial lighting appears to "confuse" seabirds, particularly during their migration between urbanized nesting sites and their offshore feeding grounds.

Direct effects to seabirds include collisions with lighted structures or the light fixtures (Montevecchi 2006). Mass collisions of birds with lighted structures can result in high levels of mortality. Mass collisions and incidences of hundreds, thousands, and tens of thousands of circling birds have been reported at coastal and offshore artificial light sources (Bourne 1979, Wiese et al. 2001). Seabirds are attracted to the flares of offshore O&G platforms and can be killed by intense heat, collisions with structures, and by oil on and around the platforms (Wiese et al. 2001, Burke et al. 2005). Both the intensity and oceanographic novelty of these light sources could have a cumulative effect on the attraction and mortality of seabirds.

Indirect effects associated with artificial lighting are difficult to document. The holding or trapping of migrating birds at intense light sources can deplete their energy reserves, leaving them incapable of making it to nearest landfalls (Montevecchi 2006). Energy depletion in migratory seabirds could have severe consequences for winter survival or reproduction. Lighting could also attract predators (e.g., gulls and Peregrine Falcons) to the vicinity of offshore platforms, which in turn could predate upon nocturnal seabirds attracted by artificial lights.

The Pacific OCS platforms are currently and will continue to be lit for compliance with the U.S. Coast Guard (USCG) navigational hazard requirements during routine operations. Lighting on the platforms will be sufficient to assure safe operations and to be in compliance with USCG navigation hazard requirements but are not expected to result in significant impacts to the marine wildlife found in the region if the recommended mitigations are implemented. Observations from platforms Irene, Hermosa, Gail, Gina, and Edith by Reitherman and Gaede (2010) in the fall of 2010 indicated that bird species observed during 20 night-monitoring events showed no signs of being attracted to or confused by the lit platforms they were monitoring. In addition, Reitherman and Gaede did not observe any evidence of birds deviating significantly from there predetermined migratory pathway. It is not known whether or to what extent such attraction disrupts migration or foraging behavior.

Appendix C: Delisted Species and Listed Species with No Effects Determinations

This section discusses the delisted species as well as the listed species and CHs that were determined to have no effects from the proposed action. This information is included in this section to document our previous discussion between BOEM and USFWS regarding our final determinations of these species and CHs.

C.1. Delisted Species

Several species or taxa have been removed from the list of threatened and endangered species that were included in earlier consultations with the USFWS on BOEM's actions. The following species are no longer listed under the ESA and are not subject to consultation requirements pursuant to section 7:

- Aleutian Cackling (Canada) Goose (*Branta hutchinsii [canadensis] leucopareia*)
- Brown Pelican (*Pelecanus occidentalis*)
- Bald Eagle (*Haliaeetus leucocephalus*)
- American Peregrine Falcon (*Falco peregrinus anatum*)
- Santa Barbara Song Sparrow (*Melospiza melodia graminea*) - extinct
- Island Night Lizard (*Xantusia [=Klauberina] riversiana*)

C.2. Listed Species and CH with No Effects Determinations

BOEM has determined that the proposed action in the SCPA will have no effect to several of the listed species and their designated CH. Those species and rationale of the no effect determinations are discussed in this section. Although some of these species were considered in previous consultations for other proposed actions, due to the "no effect" determination, these species and their designated CH (if any), are not discussed further in this BA.

C.2.1 California Condor

The California Condor (*Gymnogyps californianus*) was listed as endangered on March 11, 1967 (32 FR 4001) and had CH designated on September 22, 1977 (42 FR 47840). All free-ranging California Condors were removed from the wild by 1987 for captive breeding. Since 1992, California Condor chicks have regularly been released to the wild and the total world population now numbers about 400 birds; 235 of which are free-flying wild birds in California, Arizona, Utah, and Baja California (USFWS 2013a). In California, California Condors now inhabit the mountain ranges that surround the southern part of the San Joaquin Valley. Those that live along the coast in the Big Sur area on the Monterey County coastline have been observed feeding on the carcasses of whales (Order Cetacea), California sea lions (*Zalophus californianus*), and other marine species along the marine coastline (USFWS 2013a). BOEM is not aware of any observations of California Condors feeding along the marine coastline south of Big Sur as most of the birds south of Monterey County are restricted to more inland mountain ranges in San Luis Obispo, Santa Barbara, Ventura, and Los Angeles Counties. Moreover, their CH is located further inland (i.e., not close to the shoreline) and do not overlap with the SCPA. Therefore, due to the California candors' absence from the marine coastline south of Monterey County and their CH occurring close to shore, the continuation of the proposed action in the SCPA will have **no effect** on the California Condor or its CH.

C.2.2 California Ridgway's Rail

The California Ridgway's Rail (*Rallus obsoletus obsoletus*) (formerly California Clapper Rail (*Rallus longirostris obsoletus*) was listed as endangered on October 13, 1970 (35 FR 16047). This taxon was considered in two previous biological opinions (USFWS 1980a, USFWS 1983); both of which noted that this taxon may be vulnerable to an oil spill but recognized that oil spills from activities in the SCPA were unlikely to affect occupied habitat. The California Ridgway's Rail is now generally restricted to the San Francisco Bay area and no longer occurs in the vicinity of the SCPA. The California Ridgway's Rail was formerly a breeding species in Morro Bay and Elkhorn Slough but was extirpated from those locations. The last breeding record for Morro Bay was in 1942 with casual visitants seen as late as 1972 (Marantz 1986), and the last Elkhorn Slough record was in 1980 (Roberson 2002). Records of California Ridgway's Rail sightings beyond San Francisco Bay are now sparse (USFWS 2013b). Due to the taxa's current distribution, BOEM has determined that the proposed action in the SCPA will have no effect on the California Ridgway's Rail.

C.2.3 California Sea Blite

The California sea-blite (*Suaeda californica*), a plant found in tidally influenced areas, was listed as endangered on December 15, 1994 (59 FR 64613). A recovery plan was approved on August 27, 2013, and CH has not been designated. Because the California sea-blite occupies such a narrow band in the intertidal zone, it is threatened by any natural processes or human activities that even slightly alter this habitat. Such threats include increased sedimentation of Morro Bay, the encroachment of sand on the east side of the spit and dredging projects within the channel of the bay (59 FR 64623). The California sea-blite historically ranged from the San Francisco Bay estuary to Morro Bay. Today, the only naturally occurring populations are restricted to the coastal marsh habitat of Morro Bay, where it occurs in a very narrow band in the upper intertidal zone (USFWS 2013b) and occurrences at Old, San Geronimo, and Villa Creeks in the Cayucos area just north of Morro Bay (Walgren 2006). The distribution of California sea-blite around Morro Bay was mapped in the early 1990s (59 FR 64623). On the east side of the bay, colonies occur adjacent to the communities of Morro Bay, Baywood Park, and Cuesta by-the-Sea, although it apparently is absent from the more interior portion of the marshlands created by Chorro Creek runoff. On the west side of the bay, it is found along most of the spit, excepting the northern flank adjacent to the mouth of the bay. The California sea-blite's colonial habits make it difficult to estimate the population; however, one estimate places the number of individuals at no more than 500 (59 FR 64623). The species occurs north of any of the areas that oil spill modeling projects impacts occurring from an oil spill from offshore O&G facilities in the SCPA. Therefore, BOEM has determined that the proposed action within the SCPA will have **no effect** on California sea-blite.

C.2.4 Other Species Considered

Other listed species in past biological opinions that clearly occur outside the SCPA include the endangered salt marsh harvest mouse (*Reithrodontomys raviventris*), San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*), Callipe silverspot butterfly (*Speyeria callippe callippe*), San Bruno Elfin Butterfly (*Callophrys mossii bayensis*), Smith's blue butterfly (*Euphilotes enoptes smithi*), mission blue butterfly (*Icaricia icariodes missionensis*), and Menzie's wallflower (*Erysimum menziesii*). The ongoing and reasonably foreseeable future proposed actions will have **no effect** on these species.

Other listed species considered in past biological opinions due to the analysis of proposed onshore facilities at that time that no longer need to be considered include the endangered Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*), unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), Palos Verdes blue butterfly (*Glaucopsyche lygdamus palosverdesensis*), and El Segundo blue butterfly (*Shijimiaeoides battoides allyni*). No future onshore facilities and therefore **no effects** are expected as a result of the reasonably foreseeable future O&G activities on the Pacific OCS.

San Clemente Island endemic species and taxa that were considered in previous biological opinions include the endangered San Clemente Island bush-mallow (*Malacothamnus clementinus*), San Clemente Island larkspur (*Delphinium variegatum* ssp. *kinkiense*), San Clemente Loggerhead Shrike (*Lanius ludovicianus mearnsi*), and San Clemente Bell's (Sage) Sparrow (*Artemisiospiza* [*Amphispiza*] *belli clementae*); and the threatened San Clemente Island lotus (*Acmispon dendroideus* var. *traskiae* [=*Lotus d.* subspecies *traskiae*]), and San Clemente Island Indian paintbrush (*Castilleja grisea*). These species are within the action area and could be exposed to spilled oil if a large spill were to occur in the vicinity of San Clemente Island, but it is unlikely that oil from an accidental spill would contact San Clemente Island (Appendix A). In addition, these listed species would not normally be found in the intertidal zone where contact with oil could occur. Therefore, there will be **no effect** to these listed species from the proposed activities.

In addition, there are a number of other species that have been listed since the last SCPA-wide consultations were done, including a number of Channel Islands endemic species and including the endangered Santa Catalina Island fox (*Urocyon littoralis catalinae*), Catalina Island mountain-mahogany (*Cercocarpus traskiae*), Hoffmann's rock cress (*Arabis hoffmannii*), Hoffmann's slender-flowered gilia (*Gilia tenuiflora* ssp. *hoffmannii*), island barberry (*Berberis pinnata* ssp. *insularis*), island bedstraw (*Galium buxifolium*), island malacothrix (*Malacothrix squalida*), island phacelia (*Phacelia insularis* ssp. *insularis*), San Clemente Island woodland-star (*Lithophragma maximum*), Santa Barbara Island liveforever (*Dudleya traskiae*), Santa Cruz Island bush-mallow (*Malacothamnus fasciculatus* var. *nesioticus*), Santa Cruz Island fringepod (*Thysanocarpus conchuliferus*), Santa Cruz Island malacothrix (*Malacothrix indecora*), Santa Cruz Island rockcress (*Sibara filifolia*), Santa Rosa Island manzanita (*Arctostaphylos confertiflora*), and soft-leaved paintbrush (*Castilleja mollis*); and the threatened island rush-rose (*Helianthemum greenei*) and Santa Cruz Island dudleya (*Dudleya nesiotica*). Oil from an accidental spill is not expected to contact San Clemente Island, Santa Catalina Island, or Santa Barbara Island though (Appendix A). While some modeled trajectories do predict oil reaching the shores of Santa Cruz Island, Santa Rosa Island, and San Miguel Island, listed species on those islands are not found in the intertidal zone where contact with oil could occur. Therefore, there will be **no effect** to these island-endemic listed species from the proposed activities.

Appendix C: Delisted Species and Listed Species with No Effects Determinations

U.S. Department of the Interior (DOI)
DOI protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

Bureau of Ocean Energy Management (BOEM)
BOEM's mission is to manage development of U.S. Outer Continental Shelf energy and mineral resources in an environmentally and economically responsible way.