
Offshore Information for Area Contingency Planning

Pacific

Offshore Environmental Sensitivity Index (ESI) Atlas

Technical Document #6

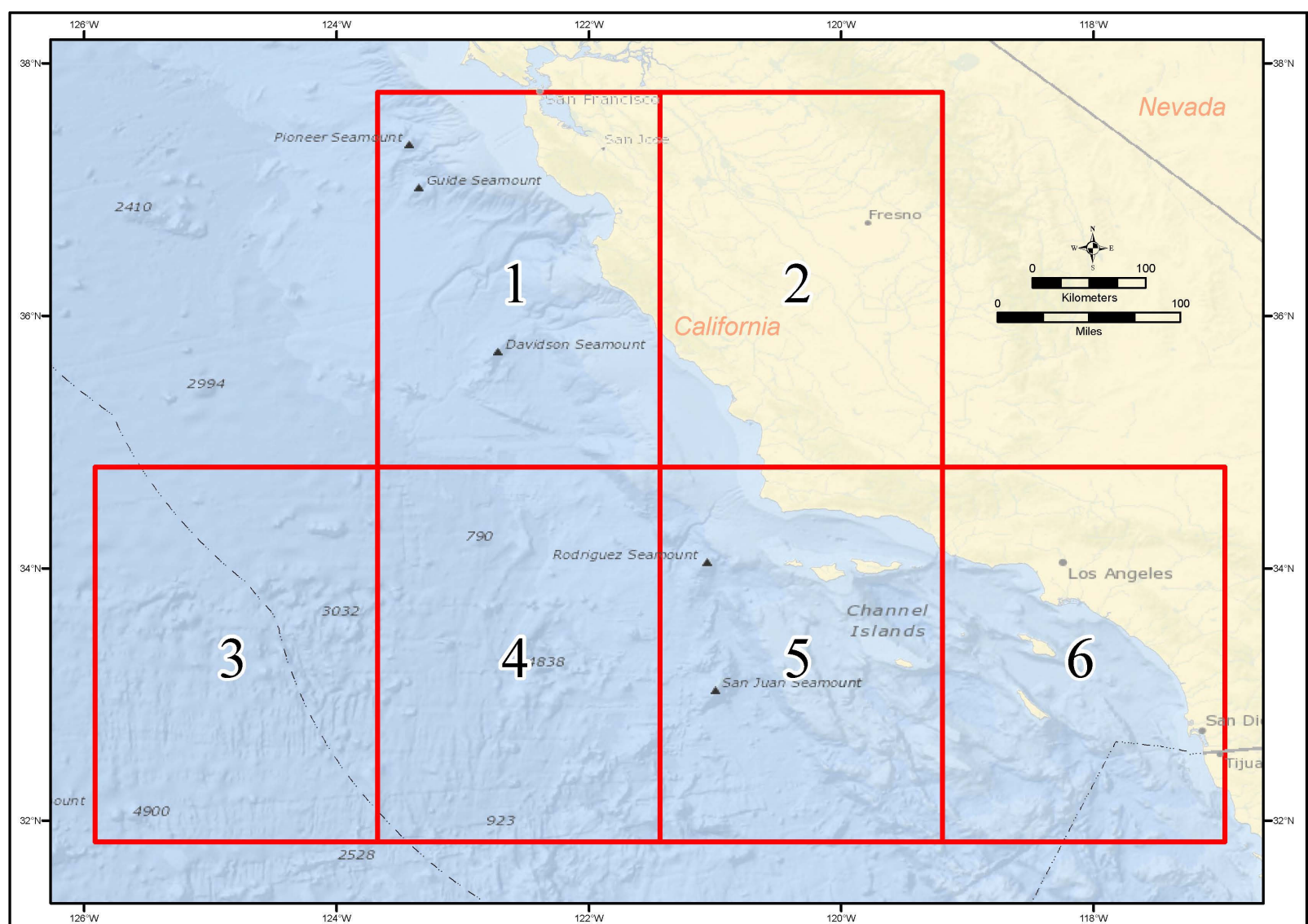
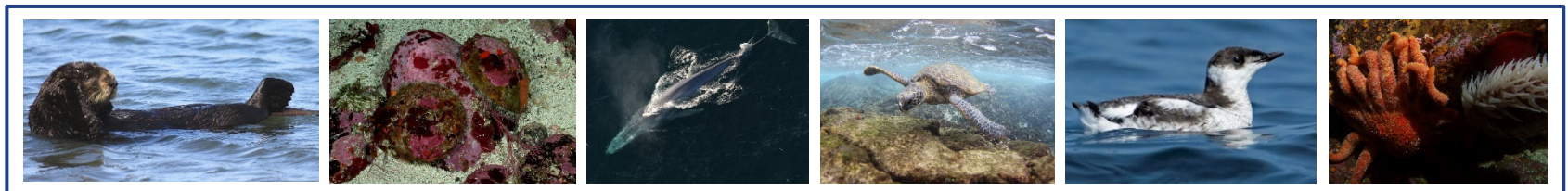
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Los Angeles / Long Beach California Offshore Environmental Sensitivity Index Maps

A Guide to Marine Resources at Risk to Spilled Oil



**Bureau of Safety and
Environmental Enforcement**

31 July 2024

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Los Angeles / Long Beach California
Offshore Environmental Sensitivity Index
A Guide to Marine Resources at Risk to Spilled Oil

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Los Angeles / Long Beach California Offshore Environmental Sensitivity Index

A Guide to Marine Resources at Risk to Spilled Oil

INTRODUCTION

Environmental Sensitivity Index (ESI) maps have been developed for the U.S. Coast Guard Sector Los Angeles-Long Beach Captain of the Port (COTP) Area of Responsibility (AOR) and comprises federal waters offshore of State of California waters (3 nautical miles from shore) from the Monterey-San Luis Obispo County line extending south to the Orange-San Diego County line including waters of the exclusive economic zone (EEZ).

The ESI atlas is a compilation of information on sensitive biological resources. Though the data will be useful for many natural resource applications, the goal of the ESI data is to present a concise summary of resources that may be particularly vulnerable to spilled oil. The intent of the data should caveat other uses. As an example, the ESI is not intended to present a catalog or comprehensive listing of species present in an area, rather the focus is on species particularly sensitive to oiling and life stages where vulnerability may increase.

SENSITIVE BIOLOGICAL RESOURCES

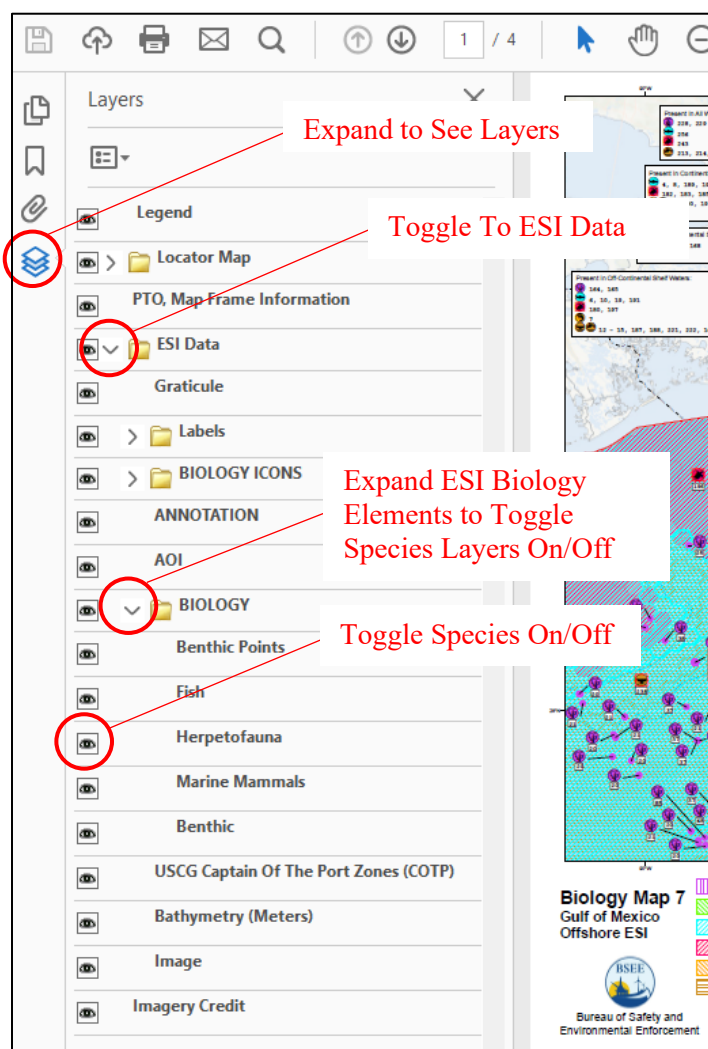
Biological information presented in this atlas was collected, compiled, and reviewed with the assistance of biologists and resource managers from the following agencies:

- NOAA Fisheries (aka National Marine Fisheries Service (NMFS))
- NOAA Office of National Marine Sanctuaries (ONMS)
- NOAA National Centers for Coastal Ocean Science (NCCOS)
- NOAA Deep Sea Coral Research and Technology Program (DSCRTP)
- United States Geological Survey (USGS)
- Bureau of Ocean Energy Management (BOEM)
- United States Fish and Wildlife Service (USFWS)
- Santa Barbara Coastal Long Term Ecological Research (SBC LTER)

The above organizations provided much of the biological information included in the atlas. Other participating organizations will be featured in the sources table and cited in the metadata accompanying the digital product.

The biological resources shown in this atlas were extracted from the ESI GIS data compiled for this region. The biological resources shown on these maps are "layered" in the PDF maps. This allows the user to turn on or off the biological features to create thematic maps or to see overlapping polygons more clearly. Narrative species/taxa profiles that include range maps made from the ESI data accompany this atlas. The range maps in the profiles are layered PDF files, which allow the user to turn on or off selected data layers.

General Instructions on Using Layered PDF



KEY FEATURES ON ESI MAPS

- 1) Animal and plant species that are at risk during oil spills and/ or spill response are represented in the database by polygons and points.
- 2) Species have been divided into groups and subgroups based on their behavior, morphology, taxonomic classification, and spill vulnerability and sensitivity. The icons below reflect this grouping scheme.
- 3) There is a Resources at Risk number (RAR#) associated with each polygonal or point feature. The RAR# references a table in the database that contains species names (common and scientific) associated with the feature.

BIRD

- Alcid / Pelagic
- Diving Bird
- Gull / Tern / Bird
- Shorebird
- Waterfowl

INVERTEBRATE

- Cephalopod
- Echinoderm
- Gastropod
- Shrimp

FISH

- Fish

MARINE MAMMALS

- Dolphin
- Pinniped
- Sea Otter
- Whale

BENTHIC

- Coral / Kelp / Reef

HERPETOFAUNA

- Turtle

- 4) Also associated with each species in the table is the federal (F) and state (S) protected status as threatened (T) or endangered (E), as well as concentration, seasonality, and life-history information. Federal listings were provided by NOAA Fisheries and USFWS; state listings were provided by the California Department of Fish and Wildlife.
- 5) The table includes a Mapping Qualifier with each species record (see table of mapping qualifiers and guidelines below). The mapping qualifier should help users understand vulnerabilities associated with the map data.
- 6) Feature-level source information is included for each species within each RAR#, meaning there is a link to a table containing Geographic (G) and Seasonality (S) sources. Full bibliographic information is included for each source in the sources table. Additionally, feature information is included in the GIS database used to create these maps. The GIS data also provide the extent polygons or points for all mapped features; it can be queried, filtered, and used with other GIS datasets.

Mapping Qualifiers and Guidelines

Element	Qualifier	Guidelines
All	Concentration Area	Areas where concentrations are considerably higher than other records of the same species in the area of interest.
All	General Distribution	Used for broad, general distributions of species that are often mapped to landscape- or habitat-scale features.
All	Vulnerable Occurrence	Intended for records of rare species with discrete occurrences, where the conservation value of the species should be highlighted for spill response.
Birds, Herps, Fish, Inverts	Migration	Used when an area is a known staging area of high importance to the species for birds; and/or areas are potential or known migration corridors in the marine environment for other elements.

- 7) The table, Present Throughout Box (PTO), describes how the general geographic location is determined for the PTO boxes displayed on the ESI maps. The individual species status (threatened/endangered) is the primary filtering criteria for determining what is displayed on the maps versus what is put in the PTO box. Not every species with a status will be shown on the map and may be shown in the PTO box. Additional filtering for PTO includes the spatial extent of the species or species

assemblage polygons relative to the area of interest (AOI) on each map. The purpose of the PTO is to declutter the map and increase readability.

Present Throughout Boc (PTO)

PTO Designation	Description
Present In All Water	Species or species assemblage polygons that cover most, if not all, water in the AOI for a map.
Present In Continental Shelf Waters	Species or species assemblage polygons that cover most, if not all, waters from the California state waters boundary to the continental shelf break. A depth of approximately 200 meters was used to define the shelf break in this area.
Present In Continental Slope Waters	Species or species assemblage polygons that cover most, if not all, waters from the continental shelf to the continental rise. A depth of approximately 200 to 3,000 meters was used to delineate this area.
Present In Continental Rise Waters	Species or species assemblage polygons that cover most, if not all, waters from the continental slope out to the Economic Exclusive Zone (EEZ) boundary. A depth of approximately 3,000 meters was used to delineate the inshore extent of this area.
Present In Continental Shelf and Slope Waters	Species or species assemblage polygons covering most, if not all, continental shelf and continental slope waters.
Present In Continental Slope and Rise Waters	Species or species assemblage polygons covering most, if not all, continental slope and continental rise waters.

Birds

Birds displayed in this atlas include diving birds, gulls, terns, and pelagic birds. Species that are conservation priority are specifically emphasized, including four ESA-listed species: marbled murrelet (FT, SE), Hawaiian petrel (FE), California least tern (FE, SE), and short-tailed albatross (FE). Two additional California state-listed species are also included: Guadalupe murrelet (ST) and Scripps's murrelet (ST). Bird occurrence information displayed in this atlas is based on data and information gathered at virtual workshops and via email correspondence with resource experts from BOEM and NOAA. Additional hardcopy and digital sources are listed below and included in the metadata.

ESA-listed species – The four ESA-listed species, marbled murrelet (FT, SE), Hawaiian petrel (FE), California least tern (FE, SE), and short-tailed albatross (FE) were mapped using a combination of expert knowledge and survey data. Polygons were drawn showing the distribution of each species using eBird records, other survey data, and expert knowledge as a guide. Hawaiian petrel, California least tern, and short-tailed albatross were mapped exclusively using these sources (model data do not exist for these species); however, marbled murrelet was also included in the seabird model results as described below.

Marine birds– Marine birds were mapped using model data provided by BOEM. The BOEM study modeled at-sea densities of marine birds on the Pacific Outer Continental Shelf (OCS) using a combination of seabird survey data and environmental predictor variables. The authors used a boosted generalized additive modeling framework to estimate relationships between bird species/group survey data and environmental variables, and those relationships were used to predict estimated density of each species/group throughout the Pacific OCS in each season (Leirness et al. 2021). A total of 46 species and taxonomic groups were modelled individually, and those individual model results were compiled using guidance from the report authors to present the summary seabird distributions and concentrations presented in the ESI. A grouping scheme that grouped modeled species and taxonomic groups based on waters they are likely to inhabit (determined from survey data and expert knowledge) was created to derive annual multi-species maps and summarize the model results. The grouping scheme consisted of the following groups:

- Coastal seabirds: Species that mainly inhabit coastal waters;

- Shelf seabirds: Species that tend to inhabit waters near the continental shelf break and slope; and
- Pelagic seabirds: Species that mainly inhabit offshore waters beyond the continental slope.

The derived annual multi-species maps for each habitat group showed average relative densities for the group, which were then normalized and classified into low, medium, and high concentration polygons throughout the entire Pacific OCS based on the following percentiles:

- Coastal seabirds: <50%, 50 to 66%, and >66%;
- Shelf seabirds: <50%, 50 to 66%, and >66%; and
- Pelagic seabirds: <25%, 25 to 80%, and >80%.

These percentiles were chosen by resource experts so each habitat group had meaningful polygons of low, medium, and high ESI concentrations within the ESI AOI. The percentiles chosen were not consistent between the habitat groups because of variation in predicted values within the Pacific OCS modeled study area.

ESI concentrations used for the derived seabird model data are: 'High Predicted Dens', 'Med Predicted Dens', and 'Low Predicted Dens'. The grouped, derived model data resulted in cumulative predicted relative densities for the grouped species and taxonomic groups (coastal, shelf, and pelagic seabirds), rather than individual species density predictions. Therefore, concentrations were assigned only to the 'Coastal seabirds', 'Shelf seabirds', and 'Pelagic seabirds' records in the ESI data. The individual species that comprised the derived habitat group models were included in the ESI data without concentration values. For more detailed information about how to interpret the model data and for further information on individual seabird species, please contact the resource experts listed in the table below.

Note that species composition within polygons and particularly concentration values are based on model results using observations made over multi-year periods and are not meant to accurately reflect 'current' conditions in the case of an event. Survey and modelling limitations, weather, and other ecological factors contribute to bird concentrations at any given time. Also, note that bird concentrations vary throughout the periods listed in the seasonality table. Please contact resource experts in the event of a spill or if data are to be used for any reason other than spill planning or response.

Expert contacts for California (Los Angeles – Long Beach Offshore ACP Area) Birds* are:

Name	Agency	City	Phone/Email	Species
Dave Pereksta	BOEM	Camarillo, CA	805-384-6389	Seabirds
Jeff Leirness	NOAA	Remote	864-656-6190	Seabirds
Arliss Winship	NOAA	Silver Spring, MD	240-347-1153	Seabirds
Matt Poti	NOAA	Silver Spring, MD	240-569-0910	Seabirds

***Note: this list is not meant to represent all bird experts for the region.**

Major Data Sources Used: Birds

Leirness JB, Adams J, Ballance LT, Coyne M, Felis JJ, Joyce T, Pereksta DM, Winship AJ, Jeffrey CFG, Ainley D, Croll D, Evenson J, Jahncke J, Mclver W, Miller PI, Pearson S, Strong C, Sydemann W, Waddell JE, Zamon JE, Christensen J. 2021. Modeling At-sea Density of Marine Birds to Support Renewable Energy Planning on the Pacific Outer Continental Shelf of the Contiguous United States. Camarillo (CA): US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2021-014. 385 p.

Leirness JB, Adams J, Ballance LT, Coyne M, Felis JJ, Joyce T, Pereksta DM, Winship AJ. 2022. NCCOS Assessment: Modeling At-sea Density of Marine Birds to Support Renewable Energy Planning on the Pacific Outer Continental Shelf of the Contiguous United States (NCEI Accession 0242882). NOAA National Centers for Environmental Information. Dataset. <https://doi.org/10.25921/xqf2-r853>. Accessed 2024-01-03.

Pereksta D. 2024. Endangered Species Act listed bird distributions, offshore California, vector digital data.

Herpetofauna

Herpetofauna depicted in this atlas include federally (F) and state (S) threatened (T) and endangered (E) sea turtles. Four sea turtle species are known to occur in the Los Angeles – Long Beach offshore ACP area: green sea turtle (FT), leatherback sea turtle (FE, SE), loggerhead sea turtle (FE), and olive ridley sea turtle (FE). Sea turtle polygons were

created based on digital data, documents, and expert knowledge provided by resource experts at NOAA Fisheries and U.S. Department of the Navy.

Leatherback sea turtle – Leatherback sea turtles were mapped using the U.S. Navy Marine Species Density Database. Maps of leatherback densities were digitized, and the resulting ESI polygons were assigned concentrations that reported the ranges of numbers of individuals per 1,000 km². Seasonality and life history stage information was provided by resource experts at NOAA Fisheries. Leatherbacks off the coast of California belong to the West Pacific Distinct Population Segment (DPS) that migrates from Indonesia to forage and most often occur during the summer and fall when sea surface temperatures are warmer.

Loggerhead sea turtle – Loggerhead sea turtles were mapped using the U.S. Navy Marine Species Density Database and expert knowledge. Maps of loggerhead densities from the Navy Database were digitized, and the resulting ESI polygons were assigned concentrations that reported the ranges of numbers of individuals per 100 km². An additional area where loggerheads may be present was mapped using expert knowledge and given a concentration of 'Potential'. Seasonality and life history stage information was provided by resource experts at NOAA Fisheries. Loggerheads off the coast of California are juveniles and belong to the North Pacific DPS that migrates from beaches in Japan, although only a small portion of this population makes it to the Eastern Pacific during warm water events such as El Niño.

Green sea turtle – Green sea turtles were mapped using the NOAA Fisheries 2023 proposed Critical Habitat (88 FR 46572) and expert knowledge. Seasonality and life history stage information was provided by resource experts at NOAA Fisheries. Green sea turtles off the coast of California belong to the East Pacific DPS. Hatchlings and early-stage juveniles occupy pelagic habitats greater than 200 m (650 ft) until a shift to a post-pelagic phase where turtles occupy neritic habitats such as coral and nearshore reefs, seagrass beds, inshore bays, estuaries, and manmade embayments.

Olive ridley sea turtle – Olive ridley sea turtles were mapped to a general polygon covering the entire AOI with a year-round concentration of "Incidental", based on expert knowledge. There are few documented occurrences of juvenile and adult olive ridleys off the coast of California, with most of these occurrences attributed to dead strandings during cold months, or skinny, debilitated "live strandings" of individuals who were off course and caught in waters that are too cold (J. Seminoff, pers. comm., 2024).

Expert contacts for California (Los Angeles – Long Beach Offshore ACP Area) Herpetofauna* are:

Name	Agency	City	Phone/Email	Species
Jeff Seminoff	NOAA	La Jolla, CA	619-846-5592	Sea turtles
Robin LeRoux	NOAA	La Jolla, CA	858-546-5659	Sea turtles

*Note: this list is not meant to represent all herpetofauna experts for the region.

Major Data Sources Used: Herpetofauna

U.S. Department of the Navy. 2024. U.S. Navy Marine Species Density Database Phase IV for the Hawaii-California Training and Testing Study Area. Technical Report. U.S. Pacific Fleet Environmental Readiness Division, Pearl Harbor, HI. 320 pp. Prepared by E. Becker and M. Zickel.

NOAA NMFS. 2024. Endangered Species Act Critical Habitat Geodatabase, vector digital data.

Fish

Fish species depicted in this atlas include marine and anadromous species of conservation concern and species of commercial, recreational, or ecological importance. Fish polygons were created based on management designations, published documents, and expert opinion provided by resource experts at NOAA Fisheries.

Marine species of conservation concern included in the atlas are oceanic whitetip shark (FT), scalloped hammerhead shark (FE), and giant manta ray (FT). The AOI for this atlas is outside of the primary range for these species; however, they can occur within the AOI when currents bring warmer waters to the area, historically during El Niño events. Polygons for these species were developed based on their range descriptions contained in listing designations, conservation documents, and expert opinion.

Southern (FE) and South-Central (FT) California DPS of steelhead trout spawn in coastal watersheds that drain into the AOI. Like other

Pacific anadromous salmonids, steelhead are primarily a marine species and only enter freshwater to spawn. These animals are known to make long-distance oceanic migrations upon emigrating from their natal streams; however, their movement patterns within the offshore ESI AOI are poorly described. As a result, they were mapped to the extent of the AOI to indicate their potential presence in the area.

Commercially important species were mapped based on Essential Fish Habitat (EFH) designations, according to the groups listed below.

Highly migratory species – Highly migratory species were mapped to the habitat polygons developed by NOAA Fisheries. While these polygons provide a representation of EFH, please note that, for some species, the official definition of EFH may specify temperature ranges or other physical conditions and can vary in spatial extent from the polygons displayed as a result.

The Pacific Coast Groundfish Fishery management plan includes several different groups of benthic or demersal species: rockfish, flatfish, roundfish, and elasmobranchs. Due to the number of species in each group and common behavior of group members, rockfishes (*Sebastes* spp.) and flatfishes were mapped as groups, rather than individual species. Roundfish and elasmobranchs were included in the atlas as individual species based on their described ranges and EFH descriptions. Species with described ranges within the AOI (e.g., occurring south of Monterey Bay) were mapped to the EFH polygon for their group.

Coastal pelagic species – Coastal pelagic species of fish (sardines, mackerel, and anchovies) were mapped based on their EFH polygons. Please note, EFH for these species is defined based on thermal ranges and the exact extent of EFH may vary temporally as a result.

Salmonids – Federally managed salmon species include pink salmon, coho salmon, and chinook salmon. All three can occur within the AOI north of Point Conception and were included in representative areas in the atlas.

Expert contacts for California (Los Angeles – Long Beach Offshore ACP Area) Fish* are:

Name	Agency	City	Phone/Email	Species
Mark Capelli	NOAA Fisheries	Santa Barbara, CA	mark.capelli@noaa.gov	Steelhead trout and salmonids
Maggie Miller	NOAA Fisheries	Washington, DC	Margaret.h.miller@noaa.gov	Giant manta ray, Scalloped hammerhead shark
Kristen Koyama	NOAA Fisheries	Washington, DC	Kristen.koyama@noaa.gov	Oceanic whitetip shark
Eric Chavez	NOAA Fisheries	Long Beach, CA	eric.chavez@noaa.gov	EFH
Gretchen Hanshaw	NOAA Fisheries	Seattle, WA	gretchen.hanshaw@noaa.gov	EFH

*Note: this list is not meant to represent all fish experts for the region.

Major Data Sources Used: Fish

McCain BB, Miller SD, Wakefield WW. 2019. Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery, Appendix B, Part 2. Pacific Fishery Management Council, Portland, OR.

Miller MH, Klimovic C. 2017. Endangered Species Act Status Review Report: Giant Manta Ray (*Manta birostris*) and Reef Manta Ray (*Manta alfredi*). National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD.

NOAA Fisheries. 2020. EFH Mapper data shapefiles, vector digital data.

NOAA Fisheries 2020. West Coast EFH shapefiles, vector digital data.

NOAA Fisheries. 2022. Identifications and descriptions for Pacific salmonids.

NMFS. 2020. Determination on the Designation of Critical Habitat for Oceanic Whitetip Shark. 85 FR 12898.

NMFS. 2015. Determination on the Designation of Critical Habitat for Three Scalloped Hammerhead Shark Distinct Population Segments. 80 FR 71774.

Invertebrates

Invertebrates depicted in this atlas include species of conservation interest and species of commercial, recreational, or ecological importance. Invertebrate polygons were created based on

management designations, documents, spatial data, and expert knowledge provided by resource experts at NOAA Fisheries.

Species of conservation concern included in the atlas include white abalone (FE) and sunflower sea star (proposed FT). White abalone are rare within the AOI and were mapped to areas corresponding to their described depth and geographic range (between 50 to 180 ft, south of Point Conception). Historically, white abalone were most abundant around offshore islands and on submerged banks.

Sunflower sea star (proposed FT) can occur from intertidal waters to depths of 435 m (1,425 ft). They were broadly present in the AOI within their described depth range prior to a widespread disease outbreak from 2013-2017. There have been only a few observations in the AOI since 2017. They were mapped based on a range polygon provided by NOAA Fisheries.

Coastal pelagic species – Coastal pelagic species of invertebrate were mapped based on their EFH polygons. Invertebrate coastal pelagic species include market squid, which is a harvested species, and krill, which are managed as an essential component of the ecosystem. Please note, EFH for these species is defined based on thermal ranges and may vary temporally as a result.

Expert contacts for California (Los Angeles – Long Beach Offshore ACP Area) Invertebrates* are:

Name	Agency	City	Phone/Email	Species/Program
Susan Wang	NOAA Fisheries	Long Beach, CA	Susan.wang@noaa.gov	Abalone species
Melissa Neuman	NOAA Fisheries	Long Beach, CA	Melissa.neuman@noaa.gov	White abalone
Nick Tolimieri	NOAA Fisheries	Seattle, WA	Nick.tolimieri@noaa.gov	Sunflower sea star

***Note: this list is not meant to represent all invertebrate experts for the region.**

Major Data Sources Used: Invertebrates

NMFS. 2008. White Abalone Recovery Plan (*Haliotis sorensen*). NMFS, Long Beach, CA.

NOAA. 2023. *Pycnopodia* range 2023-04-07, vector digital data.

NOAA Fisheries. 2020. West Coast EFH shapefiles, vector digital data.

Marine Mammals

Marine mammals mapped in the atlas include cetaceans, pinnipeds, and southern sea otter. Species that are conservation priority are specifically emphasized, including eight ESA-listed species: blue whale (FE), fin whale (FE), North Pacific right whale (FE), sei whale (FE), humpback whale (FE), sperm whale (FE), Guadalupe fur seal (FT, ST), and southern sea otter (FT). Marine mammal information displayed in this atlas is based on data and information gathered at virtual workshops and via email correspondence with resource experts from NOAA and USGS. Additional hardcopy and digital sources are listed below and included in the metadata.

ESA-listed cetaceans – ESA-listed cetaceans were mapped using a combination of seasonal density models, annual models, the U.S. Navy Marine Species Density Database, and expert knowledge. For species with seasonal density models available (blue whale, fin whale, and humpback whale), predicted densities for each season (March through June, July through November, and December through February) were mapped for each species. Predicted densities were divided into high, medium, and low concentrations based on species-specific percentiles applied to modeled density values throughout the Pacific OCS. The percentiles used for each species to determine the high, medium, and low concentrations were chosen by resource experts so each species had meaningful polygons of high, medium, and low ESI concentrations within the ESI AOI. The high, medium, and low ESI polygons for each species for each season were assigned concentrations that reported the ranges of numbers of individuals per XX km². An annual model was used to map sperm whale, with predicted densities divided into high and low concentrations, per expert guidance. The sperm whale high and low ESI polygons were assigned concentrations that reported the ranges of numbers of individuals per 10,000 km². North Pacific right whale was mapped to a polygon that covered the entire AOI using expert knowledge, and sei whale was mapped to the entire AOI with an ESI concentration that reported the density of individuals from the Navy Marine Species Density Database.

Other cetaceans – Non-listed cetaceans were mapped using a combination of seasonal density models, newly defined Biologically Important Areas (BIA II), the U.S. Navy Marine Species Density Database, other published reports, and expert knowledge. For species with seasonal density models available (bottlenose dolphin, Baird’s beaked whale, Dall’s porpoise, long-beaked common dolphin, minke

whale, northern right whale dolphin, Pacific white-sided dolphin, Risso’s dolphin, short-beaked common dolphin, small beaked whales, and striped dolphin), the season with the highest predicted densities was used to map each species year-round. Thus, for these species, the ESI data show the peak densities that may occur during the year, and actual densities may be lower depending on ocean conditions. Predicted densities were divided into high, medium, and low concentrations based on species-specific percentiles applied to modeled density values throughout the Pacific OCS. The percentiles used for each species to determine the high, medium, and low concentrations were chosen so each species had meaningful polygons of high, medium, and low ESI concentrations within the ESI AOI. The high, medium, and low ESI polygons for each species were assigned concentrations that reported the ranges of numbers of individuals per XX km².

Gray whale was mapped using the reproductive and migratory BIA II polygon. The Morro Bay resident population of harbor porpoise was mapped using the combined spatial extents of the BIA II polygon and a stratified density model.

Bryde’s whale, short-finned pilot whale, killer whale, and *Kogia* whales were mapped using the U.S. Navy Marine Species Density Database and expert knowledge. Maps of densities of each of these species from the Navy Database were digitized, and the resulting ESI polygons were assigned concentrations that reported the ranges of numbers of individuals per XX km².

Pinnipeds – Six pinniped species were included in the atlas: Guadalupe fur seal (FT), California sea lion, harbor seal, northern elephant seal, northern fur seal, and Steller sea lion. Each species was mapped using the U.S. Navy Marine Species Density Database and expert knowledge. Maps of pinniped densities from the Navy Database were digitized, and the resulting ESI polygons were assigned concentrations that reported the ranges of numbers of individuals per XX km². Seasonality and life history stage information was provided by resource experts at NOAA Fisheries.

Southern sea otter – Southern sea otters were mapped to polygons showing their range along the mainland from the USGS 2019 Annual California Sea Otter Census. An additional population of southern sea otters occurs in waters around San Nicolas Island, and these otters were mapped to all areas around the island that are less than 60 m depth.

Expert contacts for California (Los Angeles – Long Beach Offshore ACP Area) Marine Mammals* are:

Name	Agency	City	Phone/Email	Species
Karin Forney	NOAA	La Jolla, CA	831-771-4155	Cetaceans
Elizabeth Becker	NOAA	La Jolla, CA	805-680-3374	Cetaceans, pinnipeds
Sharon Melin	NOAA	Seattle, WA	206-526-4028	Pinnipeds
Tony Orr	NOAA	Seattle, WA	206-526-4512	Pinnipeds
Julie Yee	USGS	Santa Cruz, CA	916-284-7713	Southern sea otter
Joe Tomoleoni	USGS	Santa Cruz, CA	831-254-9750	Southern sea otter

***Note: this list is not meant to represent all marine mammal experts for the region.**

Major Data Sources Used: Marine mammals

Becker EA, Forney KA, Thayre BJ, Whitaker K, Hoopes R, Jones JM, Hildebrand JA, Moore JE. In prep. Evaluating seasonal vs. spatial extrapolation for cetacean distribution models in the California Current, tabular digital data.

Calambokidis J, Kratofil MA, Palacios DM, Lagerquist BA, Schorr GS, Hanson MB, Baird RW, Forney KA, Becker EA, Rockwood RC, Hazen EL. 2024. Biologically Important Areas II for cetaceans within U.S. and adjacent waters - West Coast Region. *Frontiers in Marine Science*, 11: 1283231. doi: 10.3389/fmars.2024.1283231.

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Benthic Habitats

Benthic habitats mapped in the ESI atlas include kelp and mesophotic and deep-sea corals and sponges. Benthic habitat information displayed in this atlas is based on data and information gathered at virtual workshops and via email correspondence with resource experts from NOAA and The Nature Conservancy (TNC).

Kelp – Kelp was mapped using a quarterly time series of canopy area of giant kelp (*Macrocystis pyrifera*) and bull kelp (*Nereocystis leutkeana*) derived from satellite imagery by SBC LTER. The dataset presented canopy area for individual 30 m x 30 m pixels in coastal areas of western North America. The most recent ten years of data (2015–2024) were used in the ESI. Because kelp primarily occurs nearshore of the ESI AOI boundary, there were relatively few, isolated pixels of kelp presence in the AOI. Thus, pixels with kelp presence were mapped as points in the atlas. Kelp was detected in all seasons, so it was mapped as present year-round.

Mesophotic and deep-sea corals and sponges – Mesophotic and deep-sea corals and sponges were mapped using both predictive model data and presence data. The model data were provided by NOAA NCCOS and consisted of predicted mesophotic and deep-sea coral and sponge taxon richness, based on stacked habitat suitability models of individual taxa, along a 200 m x 200 m grid from nearshore to 1,200 m depth. No deep-sea coral or sponge model data exist for areas below 1,200 m. Taxon richness was binned, and these bins were used as the ESI concentrations, for corals: '1 to 2 taxa', '3 to 4 taxa', '5 to 6 taxa', and '7 to 9 taxa'; and for sponges: '1 to 2 taxa', '3 to 4 taxa', '5 to 6 taxa', and '7 to 8 taxa'. Grid cells with the same concentration were then dissolved to create the final ESI polygons, with a minimum polygon size of 120,000 m². These models allowed for the mapping of mesophotic and deep-sea corals and sponges throughout the Los Angeles – Long Beach offshore ACP area (to 1,200 m depth) and were not limited by sampling or mapping effort in specific geographic areas.

NOAA DSCRTP provided the National Database for Deep-Sea Corals and Sponges, a point database that showed known presence of these taxa throughout the AOI. All records were mapped in the ESI, regardless of age, because these are long-lived organisms that may still be present decades after data collection. Names of coral and sponge taxa in the database were generalized to response-relevant categories (e.g., soft coral, deep sea sponge, sea pens) that were used as the ESI common names. Also, the structural group of each taxon was included in the ESI concentration field as either 'Structure-forming' or 'Solitary'. This designation was made using a crosswalk between taxon name and structural group provided by DSCRTP.

Expert contacts for California (Los Angeles – Long Beach Offshore ACP Area) Benthic Habitats* are:

Name	Agency	City	Phone/Email	Species/Program
Matt Poti	NOAA	Silver Spring, MD	240-569-0910	Mesophotic and deep-sea corals and sponges
Robert McGuinn	NOAA	Charleston, SC	843-631-7202	Deep-sea corals and sponges
Vienna Saccomanno	TNC	California	501-621-9178	Kelp

***Note: this list is not meant to represent all benthic habitat experts for the region.**

Major Data Sources Used: Benthic Habitats

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GEOGRAPHIC INFORMATION SYSTEM

The entire atlas product is stored in digital form in a Geographic Information System (GIS) as spatial data layers and associated databases. The format for the data varies depending on the type of information or features for which the data are being stored.

Under separate cover is a metadata document that details the data dictionary, processing techniques, data lineage, and other descriptive information for the digital datasets and maps that were used to create this atlas. Below is a brief synopsis of the information contained in the digital version. Refer to the metadata embedded in each feature class in the BSEE Los Angeles – Long Beach Offshore ESI geodatabase for a full explanation of the data and its structure.

Biological resources are stored as points and polygons. Associated with each feature is a unique identification number that is linked to a series of data tables that further identify the resources. The main biological resource table consists of a list of species identification numbers for each site, the concentration of each species at each site, a mapping qualifier, and identification codes for seasonality and source information. This data table is linked to other tables that describe the seasonality and life-history time periods for each species (at month resolution) for the specified map feature. Other data tables linked to the first table include: the species identification table, which includes common and scientific names; the species status table, which gives information for federal threatened or endangered listings; and the source database, which provides source metadata at the feature-species level (specific sources are listed for each species occurring at each mapped feature in the biology feature classes).

ACKNOWLEDGMENTS

This project was funded by the Bureau of Safety and Environmental Enforcement (BSEE), U.S. Department of the Interior. We want to acknowledge the great support by Bryan Rogers and John Caplis (BSEE), Gabrielle McGrath (RPS), and NOAA Scientific Support Coordinator Jordan Stout, all who assisted greatly in all aspects of the project's completion.

The biological data included on the maps were provided by numerous individuals and agencies. The individuals and agencies are listed in detail throughout the introductory pages of the ESI atlas. Staff at these organizations contributed a vast amount of information to this effort, including first-hand expertise, publications, maps, and digital data.

At Research Planning, Inc. in Columbia, South Carolina, numerous scientific, GIS, and graphic staff were involved with different phases of the project. Mark White, GIS Director, and Christine Boring, Biology Dept. Manager, were co-Project Managers. The biological data were collected and compiled onto base maps by Lauren Szathmary, Christine Boring, Jennifer Weaver, and Seamus Harrison. Lee Diveley, Katy Beckham, Mark White, and Jeff Dahlin processed and produced the GIS data and metadata. Katy Beckham, Jacqueline Michel, Christine Boring, Lauren Szathmary, and Seamus Harrison prepared the species profiles. Wendy Early produced the final documents.

APPROPRIATE USE OF ATLAS AND DATA

This atlas and the associated database were developed to provide summary information on sensitive natural resources for the purposes of oil and chemical spill planning and response. Although the atlas and database should be very useful for other environmental and natural resource planning purposes, it should not be used in place of data held by any contributing agencies. Likewise, information contained in the atlas and database cannot be used in place of consultations with natural resource agencies, or in place of field surveys. Also, this atlas should not be used for navigation.

SPECIES LIST

Common Name	Scientific Name
BENTHIC	
CORAL	
Black coral	<i>Antipathes spp.</i>
Deep sea coral	
Gorgonian corals	<i>Alcyonacea</i>
Lace coral	<i>Stylasteridae</i>
Sea pens	<i>Pennatulacea</i>
Soft coral	
Stony branching coral	
Stony coral	<i>Scleractinia</i>
Stony cup coral	
KELP	
Kelp	
REEF	
Deep sea sponge	

Common Name	Scientific Name
BIRDS	
ALCID	
Ancient murrelet	<i>Synthliboramphus antiquus</i>
Cassin's auklet	<i>Ptychoramphus aleuticus</i>
Common murre	<i>Uria aalge</i>
Craveri's murrelet	<i>Synthliboramphus craveri</i>
<u>Guadalupe murrelet</u>	<u><i>Synthliboramphus</i></u>
<u>hypoleucus</u>	
<u>Marbled murrelet</u>	<u><i>Brachyramphus marmoratus</i></u>
Pigeon guillemot	<i>Cephus columba</i>
Rhinoceros auklet	<i>Cerorhinca monocerata</i>
<u>Scripps's murrelet</u>	<u><i>Synthliboramphus scrippsi</i></u>
Tufted puffin	<i>Fratercula cirrhata</i>
BIRD	
Coastal seabirds	
Shelf seabirds	
DIVING	
Arctic loon	<i>Gavia arctica</i>
Brandt's cormorant	<i>Phalacrocorax penicillatus</i>
Brown pelican	<i>Pelecanus occidentalis</i>
Clark's grebe	<i>Aechmophorus clarkii</i>
Common loon	<i>Gavia immer</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Pacific loon	<i>Gavia pacifica</i>
Pelagic cormorant	<i>Phalacrocorax pelagicus</i>
Red-throated loon	<i>Gavia stellata</i>
Western grebe	<i>Aechmophorus occidentalis</i>
GULL_TERN	
Arctic tern	<i>Sterna paradisaea</i>
Bonaparte's gull	<i>Larus philadelphia</i>
California gull	<i>Larus californicus</i>
<u>California least tern</u>	<u><i>Sternula antillarum browni</i></u>
Caspian tern	<i>Hydroprogne caspia</i>
Common tern	<i>Sterna hirundo</i>
Elegant tern	<i>Thalasseus elegans</i>
Glaucous-winged gull	<i>Larus glaucescens</i>
Heermann's gull	<i>Larus heermanni</i>
Herring gull	<i>Larus argentatus</i>
Iceland gull	<i>Larus glaucooides</i>
Royal tern	<i>Thalasseus maximus</i>
Sabine's gull	<i>Xema sabini</i>
Western gull	<i>Larus occidentalis</i>
PELAGIC	
Ashy storm-petrel	<i>Oceanodroma homochroa</i>
Black storm-petrel	<i>Oceanodroma melania</i>
Black-footed albatross	<i>Phoebastria nigripes</i>
Black-legged kittiwake	<i>Rissa tridactyla</i>
Black-vented shearwater	<i>Puffinus opisthomelas</i>
Buller's shearwater	<i>Puffinus bulleri</i>
Cook's petrel	<i>Pterodroma cookii</i>
Flesh-footed shearwater	<i>Puffinus carneipes</i>
Fork-tailed storm-petrel	<i>Oceanodroma furcata</i>
<u>Hawaiian petrel</u>	<u><i>Pterodroma sandwichensis</i></u>
Laysan albatross	<i>Phoebastria immutabilis</i>
Leach's storm-petrel	<i>Oceanodroma leucorhoa</i>
Long-tailed jaeger	<i>Stercorarius longicaudus</i>
Murphy's petrel	<i>Pterodroma ultima</i>
Northern fulmar	<i>Fulmarus glacialis</i>
Parasitic jaeger	<i>Stercorarius parasiticus</i>
Pelagic seabirds	

Common Name	Scientific Name
BIRDS, cont.	
PELAGIC, cont.	
Pink-footed shearwater	<i>Puffinus creatopus</i>
Pomarine jaeger	<i>Stercorarius pomarinus</i>
<u>Short-tailed albatross</u>	<u><i>Phoebastria albatrus</i></u>
Short-tailed shearwater	<i>Puffinus tenuirostris</i>
Sooty shearwater	<i>Puffinus griseus</i>
South polar skua	<i>Catharacta maccormicki</i>
SHOREBIRD	
Phalaropes	<i>Phalaropus spp.</i>
WATERFOWL	
Scoters	<i>Melanitta spp.</i>

Common Name	Scientific Name
FISH	
Albacore	<i>Thunnus alalunga</i>
Bigeye tuna	<i>Thunnus obesus</i>
Blue shark	<i>Prionace glauca</i>
Bluefin tuna	<i>Thunnus thynnus</i>
Cabazon	<i>Scorpaenichthys marmoratus</i>
Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Coho salmon	<i>Oncorhynchus kisutch</i>
Dolphinfish	<i>Coryphaena hippurus</i>
Flatfish	
<u>Giant manta</u>	<u><i>Mobula birostris</i></u>
Jack mackerel	<i>Trachurus symmetricus</i>
Kelp greenling	<i>Hexagrammos decagrammus</i>
Lingcod	<i>Ophiodon elongatus</i>
Northern anchovy	<i>Engraulis mordax</i>
<u>Oceanic whitetip shark</u>	<u><i>Carcharhinus longimanus</i></u>
Pacific cod	<i>Gadus macrocephalus</i>
Pacific hake	<i>Merluccius productus</i>
Pacific mackerel	<i>Scomber japonicus</i>
Pacific sardine	<i>Sardinops sagax</i>
Pacific spiny dogfish	<i>Squalus suckleyi</i>
Pink salmon	<i>Oncorhynchus gorbuscha</i>
Rockfish	<i>Sebastes spp.</i>
Sablefish	<i>Anoplopoma fimbria</i>
<u>Scalloped hammerhead</u>	<u><i>Sphyrna lewini</i></u>
Shortfin mako	<i>Isurus oxyrinchus</i>
Skates	<i>Raja spp.</i>
Skipjack tuna	<i>Katsuwonus pelamis</i>
Spiny dogfish	<i>Squalus acanthias</i>
<u>Steelhead trout</u>	<u><i>Oncorhynchus mykiss</i></u>
Striped marlin	<i>Kajikia audax</i>
Swordfish	<i>Xiphias gladius</i>
Thresher shark	<i>Alopias vulpinus</i>
Yellowfin tuna	<i>Thunnus albacares</i>

Common Name	Scientific Name
HERPETOFAUNA	
TURTLE	
<u>Green sea turtle</u>	<u><i>Chelonia mydas</i></u>
<u>Leatherback sea turtle</u>	<u><i>Dermochelys coriacea</i></u>
<u>Loggerhead sea turtle</u>	<u><i>Caretta caretta</i></u>
<u>Olive ridley sea turtle</u>	<u><i>Lepidochelys olivacea</i></u>

Common Name	Scientific Name
INVERTEBRATES	
CEPHALOPOD	
California market squid	<i>Loligo opalescens</i>
ECHINODERM	
Sunflower sea star	<i>Pycnopodia helianthoides</i>
GASTROPOD	
<u>White abalone</u>	<u><i>Haliotis sorenseni</i></u>
LOBSTER	
Caribbean spiny lobster	<i>Panulirus argus</i>
SHRIMP	
Isada krill	<i>Euphausia pacifica</i>
Krill spp.	
Thysanoessa spinifera	<i>Thysanoessa spinifera</i>

Common Name	Scientific Name
MARINE MAMMALS	
DOLPHIN	
Bottlenose dolphin	<i>Tursiops truncatus</i>
Dall's porpoise	<i>Phocoenoides dalli dalli</i>
Harbor porpoise	<i>Phocoena phocoena</i>
Long-beaked common dolphin	<i>Delphinus capensis</i>
Northern right-whale dolphin	<i>Lissodelphis borealis</i>

Common Name	Scientific Name
MARINE MAMMALS, cont.	
DOLPHIN, cont.	
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>
Risso's dolphin	<i>Grampus griseus</i>
Short-beaked common dolphin	<i>Delphinus delphis</i>
Striped dolphin	<i>Stenella coeruleoalba</i>
PINNIPED	
California sea lion	<i>Zalophus californianus</i>
<u>Guadalupe fur seal</u>	<u><i>Arctocephalus townsendi</i></u>
Harbor seal	<i>Phoca vitulina</i>
Northern elephant seal	<i>Mirounga angustirostris</i>
Northern fur seal	<i>Callorhinus ursinus</i>
Steller sea lion	<i>Eumetopias jubatus</i>
SEA OTTER	
<u>Southern sea otter</u>	<u><i>Enhydra lutris nereis</i></u>
WHALE	
Baird's beaked whale	<i>Berardius bairdii</i>
<u>Blue whale</u>	<u><i>Balaenoptera musculus</i></u>
Bryde's whale	<i>Balaenoptera edeni</i>
<u>Fin whale</u>	<u><i>Balaenoptera physalus</i></u>
Goose-beaked whales	<i>Ziphius spp.</i>
Gray whale	<i>Eschrichtius robustus</i>
<u>Humpback whale</u>	<u><i>Megaptera novaeangliae</i></u>
Killer whale	<i>Orcinus orca</i>
Kogia spp.	<i>Kogia spp.</i>
Mesoplodont beaked whales	<i>Mesoplodon spp.</i>
Minke whale	<i>Balaenoptera acutorostrata</i>
<u>North Pacific right whale</u>	<u><i>Eubalaena japonica</i></u>
<u>Sei whale</u>	<u><i>Balaenoptera borealis</i></u>
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>
<u>Sperm whale</u>	<u><i>Physeter macrocephalus</i></u>

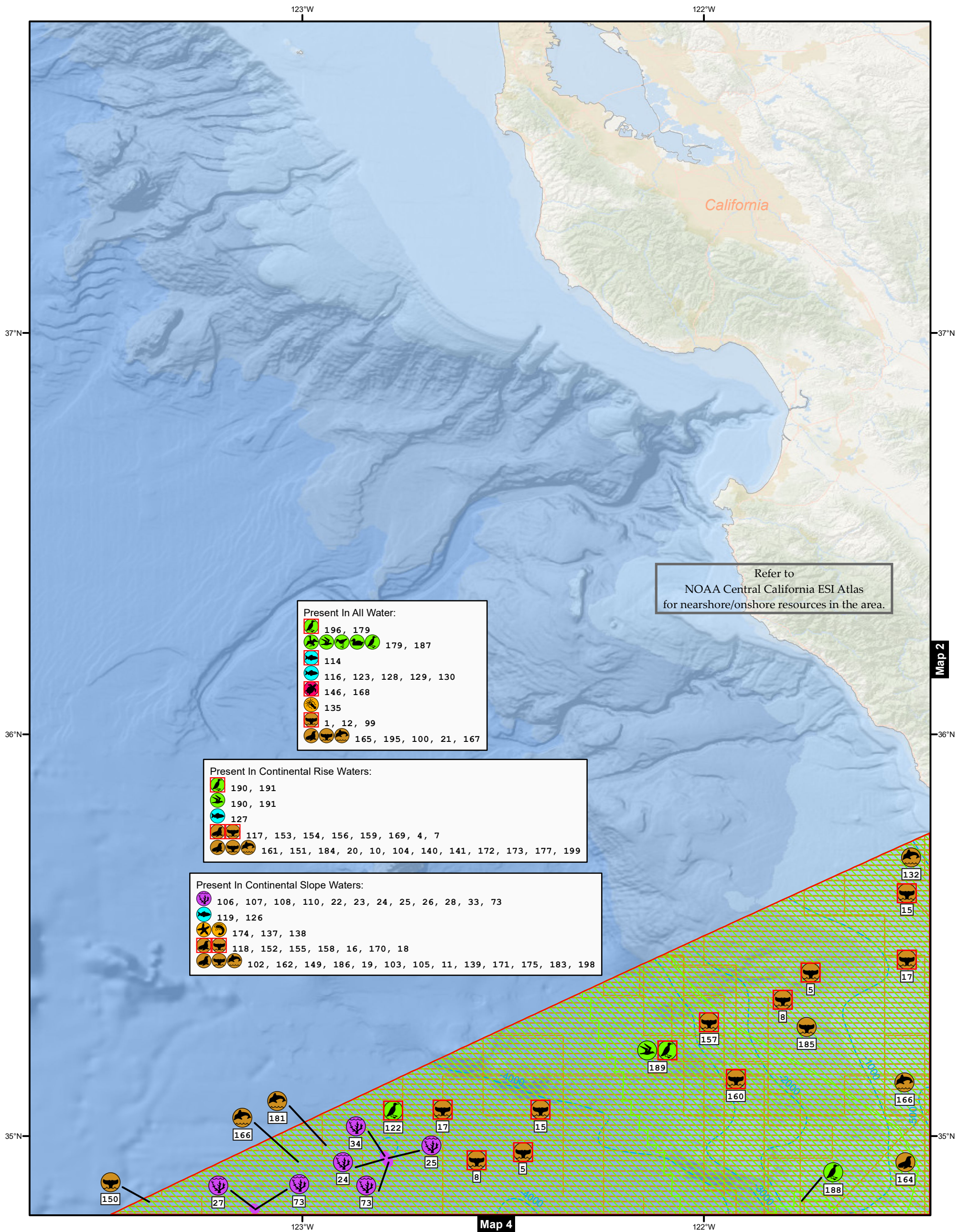
* Threatened and endangered species are designated by underlining

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**BSEE PACIFIC
LOS ANGELES / LONG BEACH
CALIFORNIA
OFFSHORE
ENVIRONMENTAL SENSITIVITY
INDEX MAPS**



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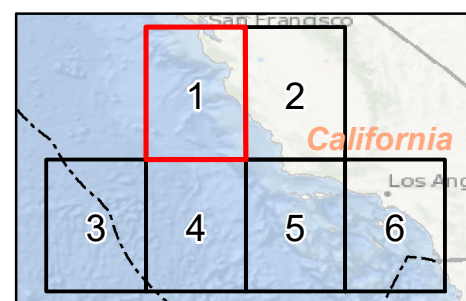
Biology Map 1

Los Angeles/Long Beach California Offshore ESI

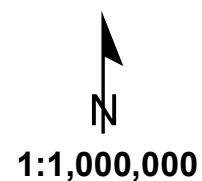
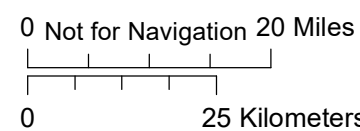


Bureau of Safety and Environmental Enforcement

- Benthic
- Birds
- Fish
- Herpetofauna
- Invertebrates
- Marine Mammals
- Benthic Points
- US Exclusive Economic Zone
- Bathymetry (Meters)
- AOI



SEE MAP DATA TABLE
for Status, Seasonality, and Breed information about mapped species.
Published: July 2024



Los Angeles/Long Beach California Offshore ESI: Biology Map 1

BIOLOGICAL RESOURCES:

BENTHIC:

RAR#	Species	S F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)
22	Deep sea sponge		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Gorgonian corals		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
23	Deep sea sponge		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Gorgonian corals		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Sea pens		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
24	Gorgonian corals		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
25	Sea pens		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
26	Deep sea sponge		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Sea pens		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
27	Stony cup coral		Solitary	Vulnerable Occurrence	J F M A M J J A S O N D
28	Gorgonian corals		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Sea pens		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
33	Black coral		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Sea pens		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
34	Black coral		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
73	Deep sea sponge		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
106	Deep sea coral		1 To 2 Taxa	General Distribution	J F M A M J J A S O N D
107	Deep sea coral		2 To 4 Taxa	General Distribution	J F M A M J J A S O N D
108	Deep sea coral		5 To 6 Taxa	General Distribution	J F M A M J J A S O N D
110	Deep sea sponge		1 To 2 Taxa	General Distribution	J F M A M J J A S O N D

BIRD:

RAR#	Species	S F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)	Nesting	Migrating	Molting
122	Hawaiian petrel	E	Rare	General Distribution		-	-	-
179	Ancient murrelet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Arctic loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black-vented shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Bonaparte's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Brandt's cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Brown pelican		-	General Distribution	J F M A M J J A S O N D	-	-	-
	California gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Caspian tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Clark's grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Coastal seabirds		Low Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
	Common loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Common murre		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Double-crested cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Elegant tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Glaucous-winged gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Heermann's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Herring gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Iceland gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Marbled murrelet	E T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pacific loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pelagic cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Phalaropes		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pigeon guillemot		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Red-throated loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Royal tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Scoters		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Western grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Western gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
187	Black-footed albatross		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black-legged kittiwake		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Cook's petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Fork-tailed storm-petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Laysan albatross		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Leach's storm-petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Murphy's petrel		-	General Distribution	F A M J J A S O N D	-	-	-
	Pelagic seabirds		Low Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
188	Black-footed albatross		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black-legged kittiwake		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Cook's petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Fork-tailed storm-petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Laysan albatross		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Leach's storm-petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Murphy's petrel		-	General Distribution	F A M J J A S O N D	-	-	-
	Pelagic seabirds		Med Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
189	Arctic tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Ashy storm-petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black storm-petrel		-	General Distribution	J M A M J J A S O N	-	-	-
	Buller's shearwater		-	General Distribution	J M A M J J A S O N D	-	-	-
	Cassin's auklet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Common tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Craver's murrelet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Flesh-footed shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Guadalupe murrelet	T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Long-tailed jaeger		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Northern fulmar		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Parasitic jaeger		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pink-footed shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pomarine jaeger		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Rhinoceros auklet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Sabine's gull		-	General Distribution	J F M A M J J A S O N	-	-	-
	Scripps's murrelet	T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Shelf seabirds		High Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
	Short-tailed shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Sooty shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	South polar skua		-	General Distribution	J A M J J A S O N	-	-	-
	Tufted puffin		-	General Distribution	J F M A M J J A S O N D	-	-	-
190	Arctic tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Ashy storm-petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black storm-petrel		-	General Distribution	J M A M J J A S O N	-	-	-
	Buller's shearwater		-	General Distribution	J M A M J J A S O N D	-	-	-
	Cassin's auklet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Common tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Craver's murrelet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Flesh-footed shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Guadalupe murrelet	T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Long-tailed jaeger		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Northern fulmar		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Parasitic jaeger		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pink-footed shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pomarine jaeger		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Rhinoceros auklet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Sabine's gull		-	General Distribution	J F M A M J J A S O N	-	-	-
	Scripps's murrelet	T	-	General Distribution	J F M A M J J A S O N D	-	-	-

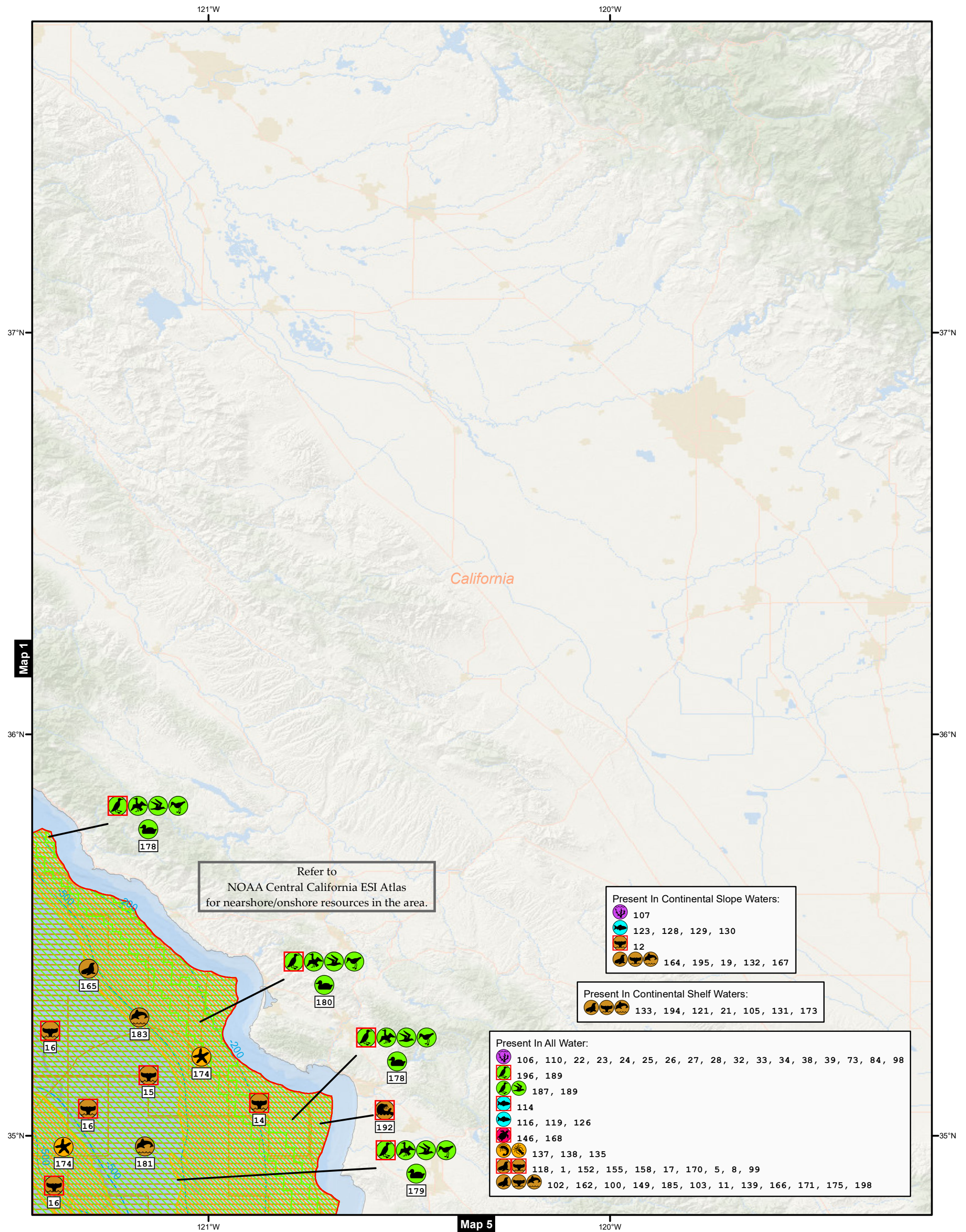
Species Threatened/Endangered

Los Angeles/Long Beach California Offshore ESI: Biology Map 1 (cont.)

BIOLOGICAL RESOURCES: (cont.)

MARINE MAMMAL (cont.):

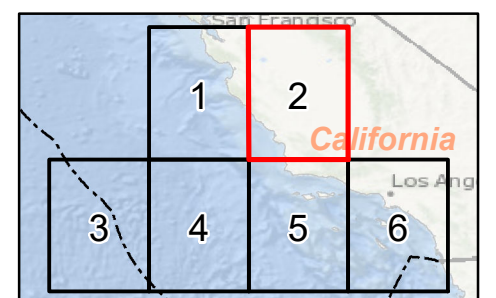
RAR#	Species	S	F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)												Mating	Calving	Pupping	Molting	
149	Minke whale			24-60 Per 10000Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
150	Minke whale			0-9 Per 10000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
151	Minke whale			9-24 Per 10000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
152	Humpback whale	E		8-158 Per 1000 Sq Km	General Distribution								J	A	S	O	N	-	-	-	-	
153	Humpback whale	E		<3 Per 1000 Sq Km	General Distribution								J	A	S	O	N	-	-	-	-	
154	Humpback whale	E		3-8 Per 1000 Sq Km	General Distribution								J	A	S	O	N	-	-	-	-	
155	Humpback whale	E		8-158 Per 1000 Sq Km	General Distribution			M	A	M	J							-	-	-	-	
156	Humpback whale	E		<3 Per 1000 Sq Km	General Distribution			M	A	M	J							-	-	-	-	
157	Humpback whale	E		3-8 Per 1000 Sq Km	General Distribution			M	A	M	J							-	-	-	-	
158	Humpback whale	E		8-158 Per 1000 Sq Km	General Distribution	J	F										D	-	-	-	-	
159	Humpback whale	E		<3 Per 1000 Sq Km	General Distribution	J	F										D	-	-	-	-	
160	Humpback whale	E		3-8 Per 1000 Sq Km	General Distribution	J	F										D	-	-	-	-	
161	Northern elephant seal			7-15 Per 100 Sq Km	General Distribution	J	F	M	A								N	D	-	-	-	-
	Northern elephant seal			0-7 Per 100 Sq Km	General Distribution							J	A	S	O			-	-	-	-	
162	Northern elephant seal			9-16 Per 100 Sq Km	General Distribution	J	F			M		J					N	D	Dec-Feb	-	Dec-Feb	-
	Northern elephant seal			4-7 Per 100 Sq Km	General Distribution			M						S				Mar-Mar	-	Mar-Mar	-	
164	Northern fur seal			24-58 Per 100 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	Jun-Aug	-	Jun-Aug	-	
165	Northern fur seal			3-24 Per 100 Sq Km	General Distribution	J	F	M	A	M								-	-	-	-	
	Northern fur seal			0-3 Per 100 Sq Km	General Distribution						J	J	A	S	O	N	D	Jun-Aug	-	Jun-Aug	-	
166	Northern right-whale dolphin			0-4 Per 100 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
167	Northern right-whale dolphin			4-35 Per 100 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
169	Sperm whale	E		14-38 Per 10000Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
170	Sperm whale	E		<14 Per 10000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
171	Pacific white-sided dolphin			127-790 Per 1000Sqkm	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
172	Pacific white-sided dolphin			0-3 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
173	Pacific white-sided dolphin			3-127 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
175	Risso's dolphin			7-179 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
177	Risso's dolphin			2-7 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
181	Short-beaked common dolphin			17-42 Per 10 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
183	Short-beaked common dolphin			6-17 Per 10 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
184	Goose-beaked whales			5-9 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
	Mesoplodont beaked whales			5-9 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
185	Goose-beaked whales			0-3 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
	Mesoplodont beaked whales			0-3 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
186	Goose-beaked whales			3-5 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
	Mesoplodont beaked whales			3-5 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
195	Steller sea lion			<1 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
198	Striped dolphin			0-9 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	
199	Striped dolphin			9-59 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	



Biology Map 2 Los Angeles/Long Beach California Offshore ESI

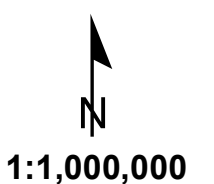


Bureau of Safety and
Environmental Enforcement



SEE MAP DATA TABLE
for Status, Seasonality, and Breed
information about mapped species.
Published: July 2024

0 Not for Navigation 20 Miles



Los Angeles/Long Beach California Offshore ESI: Biology Map 2

BIOLOGICAL RESOURCES:

BENTHIC:

RAR#	Species	S F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)
22	Deep sea sponge		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Gorgonian corals		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
23	Deep sea sponge		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Gorgonian corals		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Sea pens		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
24	Gorgonian corals		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
25	Sea pens		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
26	Deep sea sponge		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Sea pens		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
27	Stony cup coral		Solitary	Vulnerable Occurrence	J F M A M J J A S O N D
28	Gorgonian corals		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Sea pens		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
32	Gorgonian corals		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Soft coral		Solitary	Vulnerable Occurrence	J F M A M J J A S O N D
33	Black coral		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Sea pens		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
34	Black coral		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
38	Soft coral		Solitary	Vulnerable Occurrence	J F M A M J J A S O N D
39	Deep sea sponge		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Soft coral		Solitary	Vulnerable Occurrence	J F M A M J J A S O N D
73	Deep sea sponge		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
84	Sea pens		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
	Stony cup coral		Solitary	Vulnerable Occurrence	J F M A M J J A S O N D
98	Soft coral		Solitary	Vulnerable Occurrence	J F M A M J J A S O N D
	Stony branching coral		Structure-Forming	Vulnerable Occurrence	J F M A M J J A S O N D
106	Deep sea coral		1 To 2 Taxa	General Distribution	J F M A M J J A S O N D
107	Deep sea coral		2 To 4 Taxa	General Distribution	J F M A M J J A S O N D
110	Deep sea sponge		1 To 2 Taxa	General Distribution	J F M A M J J A S O N D

BIRD:

RAR#	Species	S F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)	Nesting	Migrating	Molting
178	Ancient murrelet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Arctic loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black-vented shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Bonaparte's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Brandt's cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Brown pelican		-	General Distribution	J F M A M J J A S O N D	-	-	-
	California gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Caspian tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Clark's grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Coastal seabirds		High Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
	Common loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Common murre		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Double-crested cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Elegant tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Glaucous-winged gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Heermann's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Herring gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Iceland gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Marbled murrelet	E T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pacific loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pelagic cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Phalaropes		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pigeon guillemot		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Red-throated loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Royal tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Scoters		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Western grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Western gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
179	Ancient murrelet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Arctic loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black-vented shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Bonaparte's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Brandt's cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Brown pelican		-	General Distribution	J F M A M J J A S O N D	-	-	-
	California gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Caspian tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Clark's grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Coastal seabirds		Low Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
	Common loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Common murre		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Double-crested cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Elegant tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Glaucous-winged gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Heermann's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Herring gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Iceland gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Marbled murrelet	E T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pacific loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pelagic cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Phalaropes		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pigeon guillemot		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Red-throated loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Royal tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Scoters		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Western grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Western gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
180	Ancient murrelet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Arctic loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black-vented shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Bonaparte's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Brandt's cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Brown pelican		-	General Distribution	J F M A M J J A S O N D	-	-	-
	California gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Caspian tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Clark's grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Coastal seabirds		Med Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
	Common loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Common murre		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Double-crested cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Elegant tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Glaucous-winged gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Heermann's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Herring gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Iceland gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Marbled murrelet	E T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pacific loon		-	General Distribution	J F M A M J J A S O N D	-	-	-

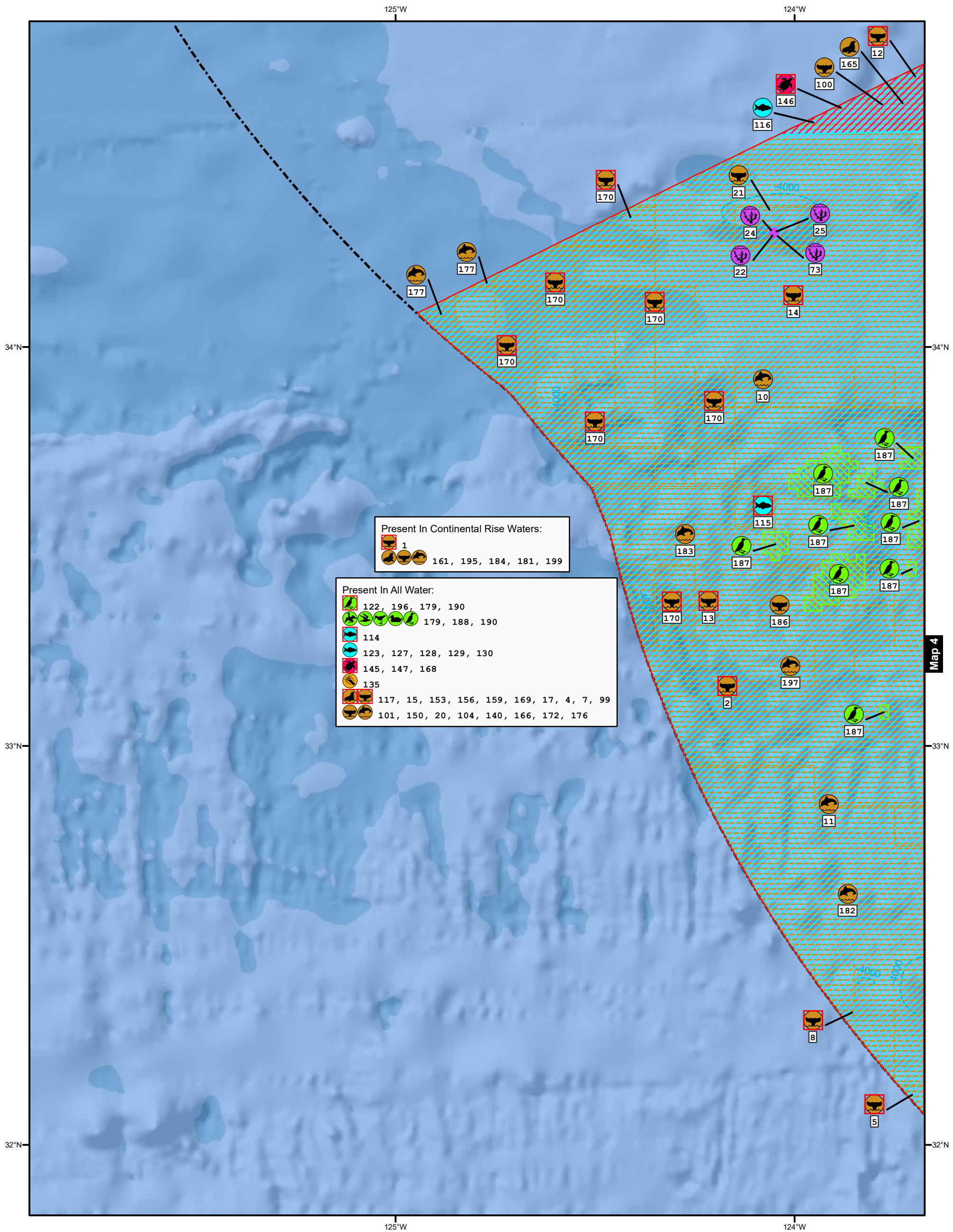
Species Threatened/Endangered

Los Angeles/Long Beach California Offshore ESI: Biology Map 2 (cont.)

BIOLOGICAL RESOURCES: (cont.)

MARINE MAMMAL (cont.):

RAR#	Species	S F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)	Mating	Calving	Pupping	Molting
121	Gray whale		Reprod; Migratory	Migration	J F M A M J J A S O N D	-	Mar-May	-	-
131	Harbor porpoise		Resident Population	Concentration Area	J F M A M J J A S O N D	-	-	-	-
132	Harbor porpoise		Resident Population	General Distribution	J F M A M J J A S O N D	-	-	-	-
133	Harbor seal		2-34 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	Mar-May	-	Mar-May	-
139	Long-beaked common dolphin		16-522 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
149	Minke whale		24-60 Per 10000Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
152	Humpback whale	E	8-158 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N	-	-	-	-
155	Humpback whale	E	8-158 Per 1000 Sq Km	General Distribution	M A M J	-	-	-	-
158	Humpback whale	E	8-158 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
162	Northern elephant seal		9-16 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	Dec-Feb	-	Dec-Feb	-
	Northern elephant seal		4-7 Per 100 Sq Km	General Distribution	M S	Mar-Mar	-	Mar-Mar	-
164	Northern fur seal		24-58 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	Jun-Aug	-	Jun-Aug	-
165	Northern fur seal		3-24 Per 100 Sq Km	General Distribution	J F M A M	-	-	-	-
	Northern fur seal		0-3 Per 100 Sq Km	General Distribution	J J A S O N D	Jun-Aug	-	Jun-Aug	-
166	Northern right-whale dolphin		0-4 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
167	Northern right-whale dolphin		4-35 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
170	Sperm whale	E	<14 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
171	Pacific white-sided dolphin		127-790 Per 1000Sqkm	General Distribution	J F M A M J J A S O N D	-	-	-	-
173	Pacific white-sided dolphin		3-127 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
175	Risso's dolphin		7-179 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
181	Short-beaked common dolphin		17-42 Per 10 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
183	Short-beaked common dolphin		6-17 Per 10 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
185	Goose-beaked whales		0-3 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
	Mesoplodont beaked whales		0-3 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
192	Southern sea otter	T	-	General Distribution	J F M A M J J A S O N D	-	-	Jan-Dec	-
194	Steller sea lion		2-3 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	Jun-Aug	-	Jun-Aug	-
195	Steller sea lion		<1 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
198	Striped dolphin		0-9 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-



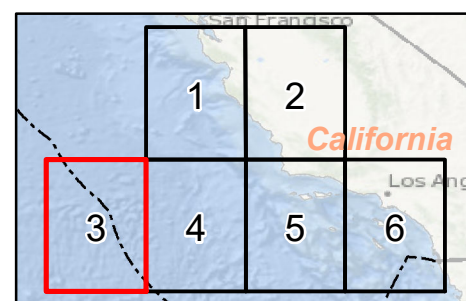
Biology Map 3

Los Angeles/Long Beach California Offshore ESI



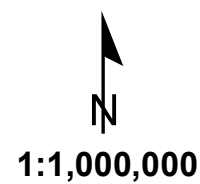
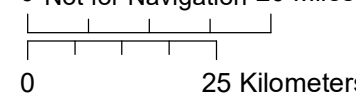
Bureau of Safety and Environmental Enforcement

- Benthic
- Birds
- Fish
- Herpetofauna
- Invertebrates
- Marine Mammals
- Benthic Points
- US Exclusive Economic Zone
- Bathymetry (Meters)
- AOI



SEE MAP DATA TABLE
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0 Not for Navigation 20 Miles



Los Angeles/Long Beach California Offshore ESI: Biology Map 3 (cont.)

BIOLOGICAL RESOURCES:

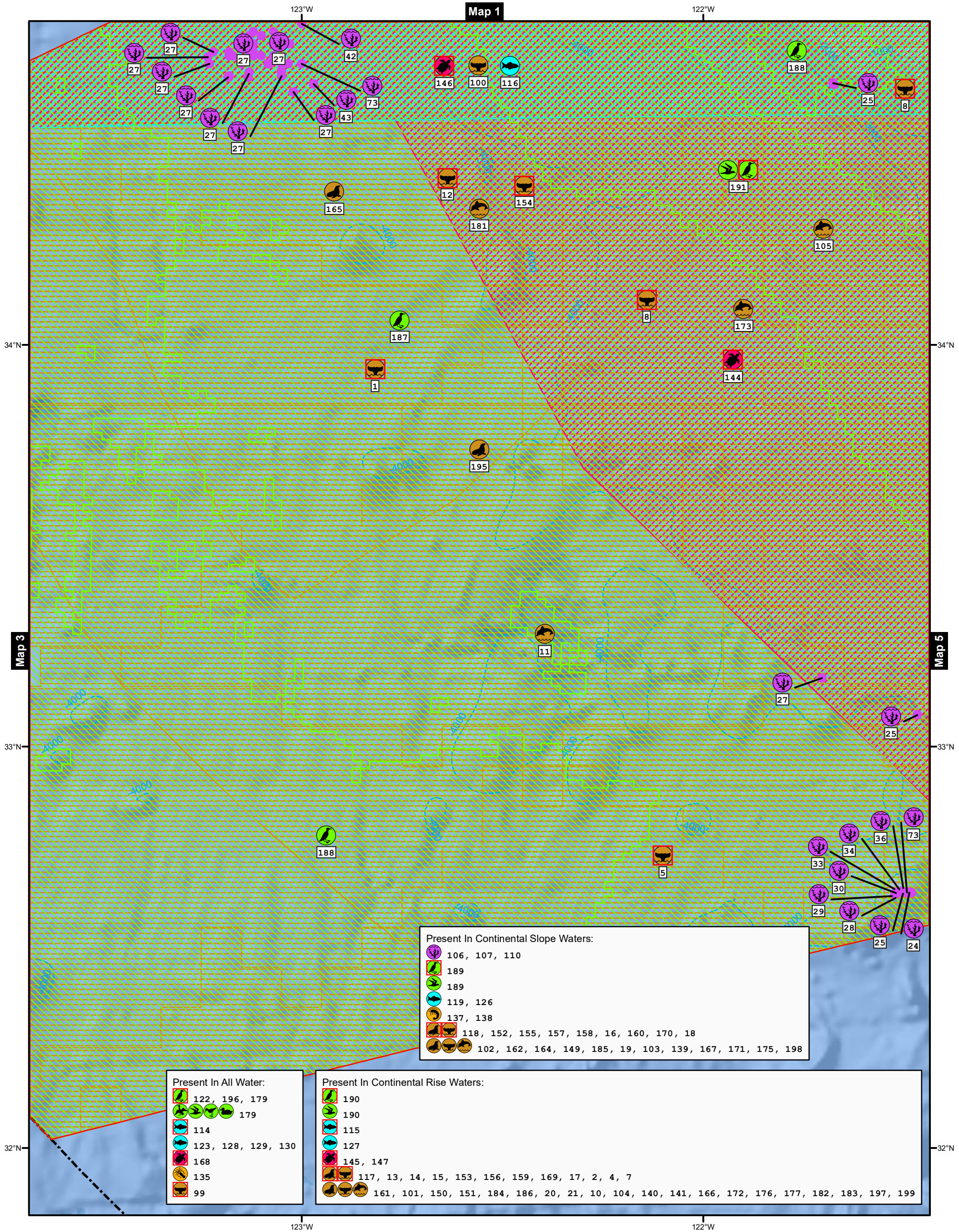
INVERTEBRATE:

RAR#	Species	S	F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)	Spawning	Eggs	Larvae	Juveniles	Adults
135	California market squid			-	General Distribution	J F M A M J J A S O N D	Jan-Dec	-	Jan-Dec	Jan-Dec	Jan-Dec

MARINE MAMMAL:

RAR#	Species	S	F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)	Mating	Calving	Pupping	Molting
1	Blue whale	E		9-40 Per 10000 Sq Km	General Distribution	J A S O N	-	-	-	-
2	Blue whale	E		2-9 Per 10000 Sq Km	General Distribution	J A S O N	-	-	-	-
4	Blue whale	E		<2 Per 10000 Sq Km	General Distribution	M A M J	-	-	-	-
5	Blue whale	E		2-9 Per 10000 Sq Km	General Distribution	M A M J	-	-	-	-
7	Blue whale	E		<2 Per 10000 Sq Km	General Distribution	J F	-	-	-	-
8	Blue whale	E		2-9 Per 10000 Sq Km	General Distribution	J F	-	-	-	-
10	Bottlenose dolphin			<1 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
11	Bottlenose dolphin			1-5 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
12	Fin whale	E		20-75 Per 1000 Sq Km	General Distribution	J A S O N	-	-	-	-
13	Fin whale	E		<6 Per 1000 Sq Km	General Distribution	J A S O N	-	-	-	-
14	Fin whale	E		6-20 Per 1000 Sq Km	General Distribution	J A S O N	-	-	-	-
15	Fin whale	E		<6 Per 1000 Sq Km	General Distribution	M A M J	-	-	-	-
17	Fin whale	E		<6 Per 1000 Sq Km	General Distribution	J F	-	-	-	-
20	Baird's beaked whale			0-1 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
21	Baird's beaked whale			1-14 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
99	Bryde's whale			5-8 Per 100000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
	North Pacific right whale	E		-	General Distribution	F M A M	-	-	-	-
	Sei whale	E		1 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
	Short-finned pilot whale			0-2 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
100	Killer whale			4-14 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
	Kogia spp.			7 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
101	Killer whale			1-4 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
	Kogia spp.			2 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
104	Dall's porpoise			0-5 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
117	Guadalupe fur seal	T	T	56-63 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
140	Long-beaked common dolphin			0-1 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
150	Minke whale			0-9 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
153	Humpback whale	E		<3 Per 1000 Sq Km	General Distribution	J A S O N	-	-	-	-
156	Humpback whale	E		<3 Per 1000 Sq Km	General Distribution	M A M J	-	-	-	-
159	Humpback whale	E		<3 Per 1000 Sq Km	General Distribution	J F	-	-	-	-
161	Northern elephant seal			7-15 Per 100 Sq Km	General Distribution	J F M A	-	-	-	-
	Northern elephant seal			0-7 Per 100 Sq Km	General Distribution	J A S O	-	-	-	-
165	Northern fur seal			3-24 Per 100 Sq Km	General Distribution	J F M A M	-	-	-	-
	Northern fur seal			0-3 Per 100 Sq Km	General Distribution	J J A S O N D	Jun-Aug	-	Jun-Aug	-
166	Northern right-whale dolphin			0-4 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
169	Sperm whale	E		14-38 Per 10000Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
170	Sperm whale	E		<14 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
172	Pacific white-sided dolphin			0-3 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
176	Risso's dolphin			0-2 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
177	Risso's dolphin			2-7 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
181	Short-beaked common dolphin			17-42 Per 10 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
182	Short-beaked common dolphin			0-6 Per 10 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
183	Short-beaked common dolphin			6-17 Per 10 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
184	Goose-beaked whales			5-9 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
	Mesoplodont beaked whales			5-9 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
186	Goose-beaked whales			3-5 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
	Mesoplodont beaked whales			3-5 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
195	Steller sea lion			<1 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
197	Striped dolphin			59-550 Per 1000Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
199	Striped dolphin			9-59 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-

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Present In Continental Slope Waters:

- 106, 107, 110
- 189
- 119, 126
- 137, 138
- 118, 152, 155, 157, 158, 16, 160, 170, 18
- 102, 162, 164, 149, 185, 19, 103, 139, 167, 171, 175, 198

Present In All Water:

- 122, 196, 179
- 114
- 123, 128, 129, 130
- 168
- 135
- 99

Present In Continental Rise Waters:

- 190
- 115
- 127
- 145, 147
- 117, 13, 14, 15, 153, 156, 159, 169, 17, 2, 4, 7
- 161, 101, 150, 151, 184, 186, 20, 21, 10, 104, 140, 141, 166, 172, 176, 177, 182, 183, 197, 199

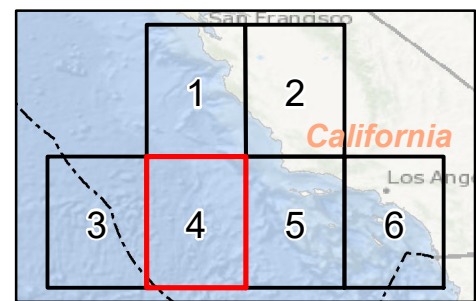
Biology Map 4

Los Angeles/Long Beach California Offshore ESI

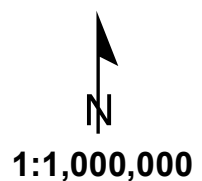
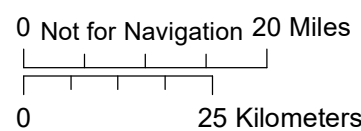


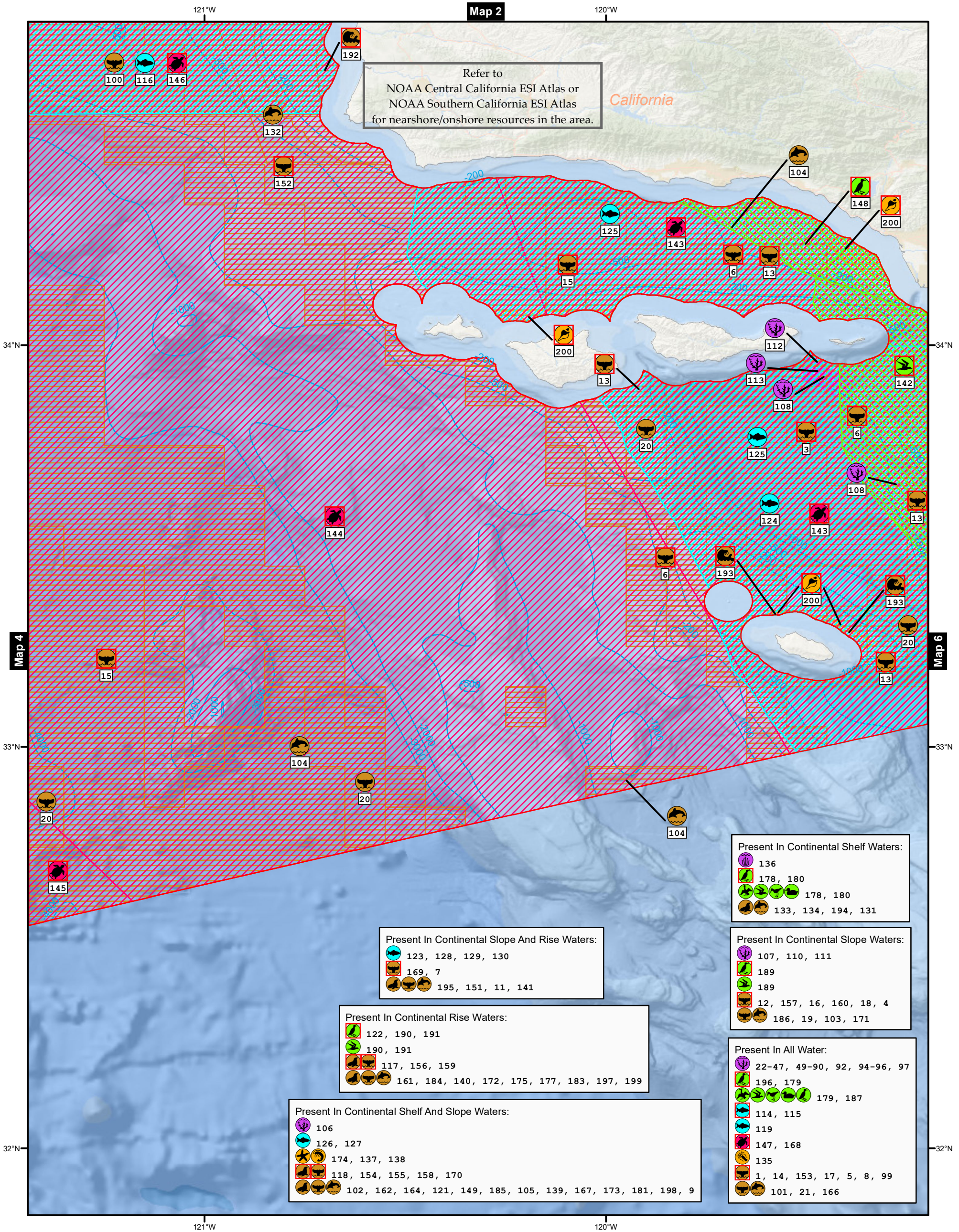
Bureau of Safety and Environmental Enforcement

- Benthic
- Marine Mammals
- Birds
- Benthic Points
- Fish
- US Exclusive Economic Zone
- Herpetofauna
- Bathymetry (Meters)
- Invertebrates
- AOI



SEE MAP DATA TABLE
for Status, Seasonality, and Breed information about mapped species.
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Refer to NOAA Central California ESI Atlas or NOAA Southern California ESI Atlas for nearshore/onshore resources in the area.

- Present In Continental Shelf Waters:**
 - 136
 - 178, 180
 - 178, 180
 - 133, 134, 194, 131
- Present In Continental Slope And Rise Waters:**
 - 123, 128, 129, 130
 - 169, 7
 - 195, 151, 11, 141
- Present In Continental Rise Waters:**
 - 122, 190, 191
 - 190, 191
 - 117, 156, 159
 - 161, 184, 140, 172, 175, 177, 183, 197, 199
- Present In Continental Shelf And Slope Waters:**
 - 106
 - 126, 127
 - 174, 137, 138
 - 118, 154, 155, 158, 170
 - 102, 162, 164, 121, 149, 185, 105, 139, 167, 173, 181, 198, 9
- Present In Continental Slope Waters:**
 - 107, 110, 111
 - 189
 - 189
 - 12, 157, 16, 160, 18, 4
 - 186, 19, 103, 171
- Present In All Water:**
 - 22-47, 49-90, 92, 94-96, 97
 - 196, 179
 - 179, 187
 - 114, 115
 - 119
 - 147, 168
 - 135
 - 1, 14, 153, 17, 5, 8, 99
 - 101, 21, 166

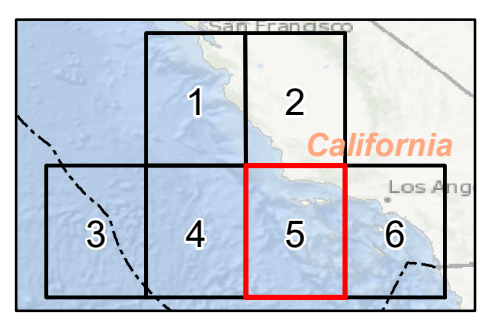
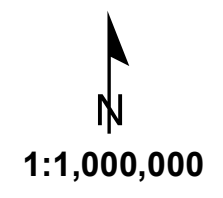
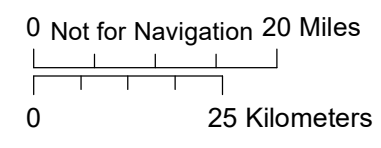
Biology Map 5 Los Angeles/Long Beach California Offshore ESI

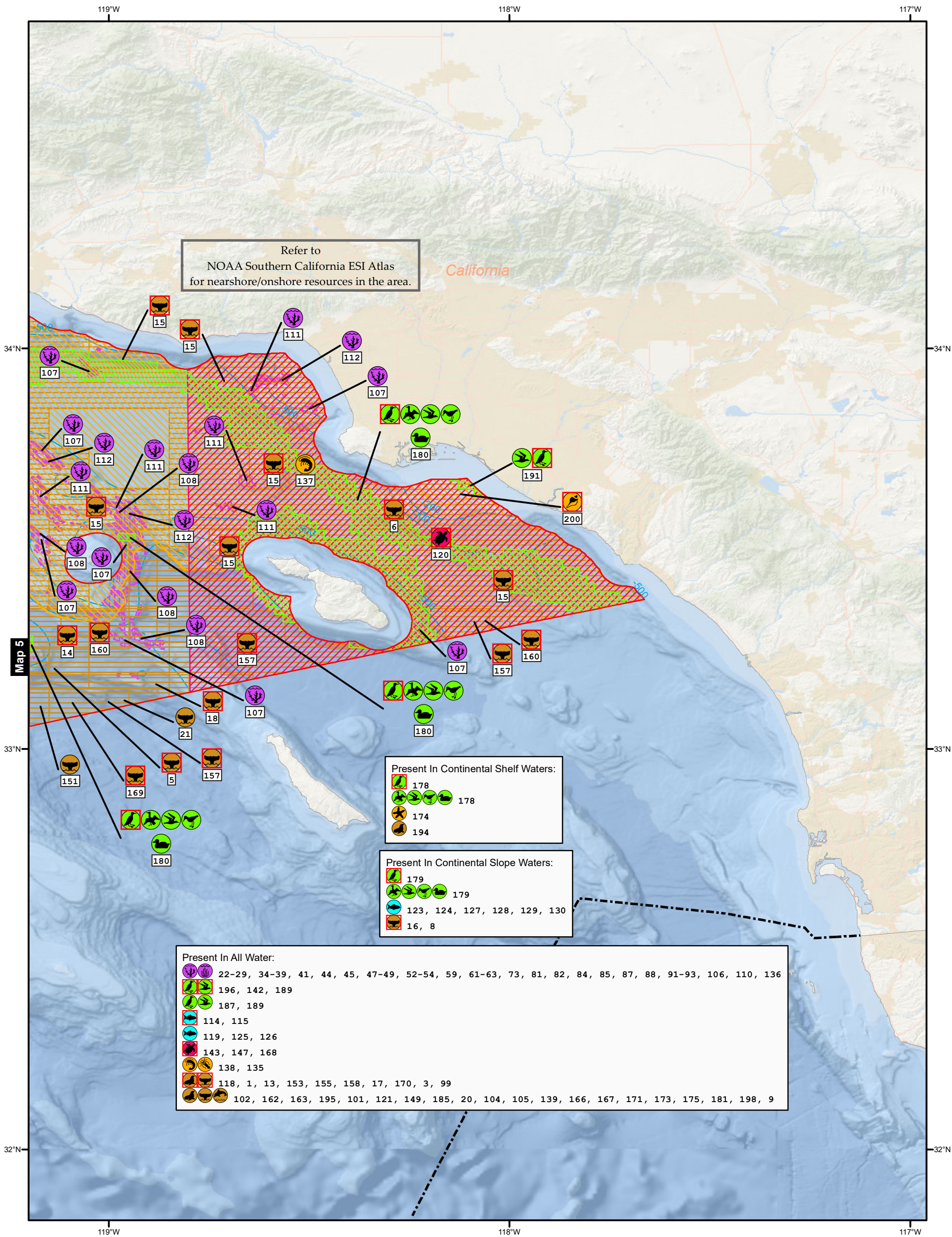


Bureau of Safety and Environmental Enforcement

- Benthic
- Birds
- Fish
- Herpetofauna
- Invertebrates
- Marine Mammals
- Benthic Points
- US Exclusive Economic Zone
- Bathymetry (Meters)
- AOI

SEE MAP DATA TABLE
for Status, Seasonality, and Breed information about mapped species.
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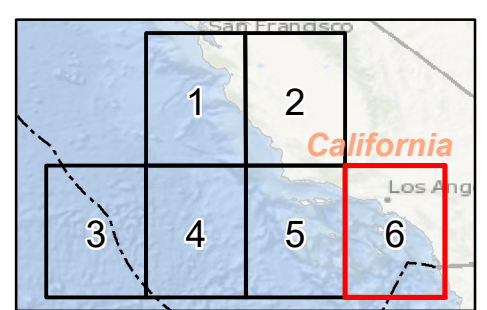
Biology Map 6

Los Angeles/Long Beach California Offshore ESI

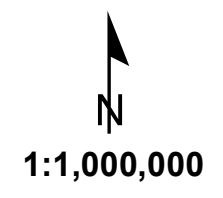
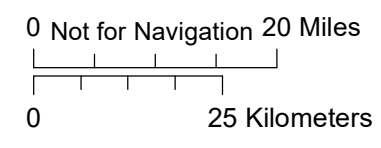


Bureau of Safety and Environmental Enforcement

- Benthic
- Birds
- Fish
- Herpetofauna
- Invertebrates
- Marine Mammals
- Benthic Points
- US Exclusive Economic Zone
- Bathymetry (Meters)
- AOI



SEE MAP DATA TABLE
for Status, Seasonality, and Breed information about mapped species.
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Los Angeles/Long Beach California Offshore ESI: Biology Map 6 (cont.)

BIOLOGICAL RESOURCES: (cont.)

BIRD (cont.):

RAR#	Species	S F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)	Nesting	Migrating	Molting
	Caspian tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Clark's grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Coastal seabirds		High Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
	Common loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Common murre		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Double-crested cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Elegant tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Glaucous-winged gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Heermann's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Herring gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Iceland gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Marbled murrelet	E T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pacific loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pelagic cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Phalaropes		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pigeon guillemot		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Red-throated loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Royal tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Scoters		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Western grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Western gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
179	Ancient murrelet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Arctic loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black-vented shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Bonaparte's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Brandt's cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Brown pelican		-	General Distribution	J F M A M J J A S O N D	-	-	-
	California gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Caspian tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Clark's grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Coastal seabirds		Low Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
	Common loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Common murre		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Double-crested cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Elegant tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Glaucous-winged gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Heermann's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Herring gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Iceland gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Marbled murrelet	E T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pacific loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pelagic cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Phalaropes		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pigeon guillemot		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Red-throated loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Royal tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Scoters		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Western grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Western gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
180	Ancient murrelet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Arctic loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black-vented shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Bonaparte's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Brandt's cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Brown pelican		-	General Distribution	J F M A M J J A S O N D	-	-	-
	California gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Caspian tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Clark's grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Coastal seabirds		Med Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
	Common loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Common murre		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Double-crested cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Elegant tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Glaucous-winged gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Heermann's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Herring gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Iceland gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Marbled murrelet	E T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pacific loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pelagic cormorant		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Phalaropes		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pigeon guillemot		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Red-throated loon		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Royal tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Scoters		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Western grebe		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Western gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
187	Black-footed albatross		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black-legged kittiwake		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Cook's petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Fork-tailed storm-petrel		-	General Distribution	J F M A M J A S O N D	-	-	-
	Laysan albatross		-	General Distribution	J F M A M J A S O N D	-	-	-
	Leach's storm-petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Murphy's petrel		-	General Distribution	F A M S	-	-	-
	Pelagic seabirds		Low Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
189	Arctic tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Ashy storm-petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black storm-petrel		-	General Distribution	J M A M J J A S O N	-	-	-
	Buller's shearwater		-	General Distribution	J M J J A S O N D	-	-	-
	Cassin's auklet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Common tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Craver's murrelet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Flesh-footed shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Guadalupe murrelet	T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Long-tailed jaeger		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Northern fulmar		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Parasitic jaeger		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pink-footed shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pomarine jaeger		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Rhinoceros auklet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Sabine's gull		-	General Distribution	J F M A M J J A S O N	-	-	-
	Scripps's murrelet	T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Shelf seabirds		High Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
	Short-tailed shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Sooty shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	South polar skua		-	General Distribution	J A M J J A S O N	-	-	-
	Tufted puffin		-	General Distribution	J F M A M J J A S O N D	-	-	-

Los Angeles/Long Beach California Offshore ESI: Biology Map 6 (cont.)

BIOLOGICAL RESOURCES: (cont.)

BIRD (cont.):

RAR#	Species	S F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)	Nesting	Migrating	Molting
191	Arctic tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Ashy storm-petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Black storm-petrel		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Buller's shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Cassin's auklet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Common tern		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Craveri's murrelet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Flesh-footed shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Guadalupe murrelet	T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Long-tailed jaeger		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Northern fulmar		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Parasitic jaeger		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pink-footed shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Pomarine jaeger		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Rhinoceros auklet		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Sabine's gull		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Scripps's murrelet	T	-	General Distribution	J F M A M J J A S O N D	-	-	-
	Shelf seabirds		Med Predicted Dens	General Distribution	J F M A M J J A S O N D	-	-	-
	Short-tailed shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Sooty shearwater		-	General Distribution	J F M A M J J A S O N D	-	-	-
	South polar skua		-	General Distribution	J F M A M J J A S O N D	-	-	-
	Tufted puffin		-	General Distribution	J F M A M J J A S O N D	-	-	-
196	Short-tailed albatross	E	Occasional	General Distribution	J F M A M J J A S O N D	-	-	-

FISH:

RAR#	Species	S F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)	Spawning	Eggs	Larvae	Juveniles	Adults
114	Jack mackerel		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Northern anchovy		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Pacific mackerel		-	General Distribution	J F M A M J J A S O N D	Apr-Sep	-	-	Jan-Dec	Jan-Dec
	Pacific sardine		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Steelhead trout	E	-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
115	Giant manta	T	Rare	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Oceanic whitetip shark	T	Rare	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Scalloped hammerhead	E	Rare	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
119	Cabezon		-	General Distribution	J F M A M J J A S O N D	Oct-Mar	-	-	-	-
	Flatfish		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Kelp greenling		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Lingcod		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Pacific cod		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Pacific hake		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Pacific spiny dogfish		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Rockfish		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Sablefish		-	General Distribution	J F M A M J J A S O N D	-	Jan-Mar	-	-	-
	Skates		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Spiny dogfish		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
123	Albacore		-	General Distribution	J F M A M J J A S O N D	-	-	-	Jan-Dec	Jan-Dec
	Blue shark		-	General Distribution	J F M A M J J A S O N D	-	-	Jan-Dec	Jan-Dec	Jan-Dec
	Bluefin tuna		-	General Distribution	J F M A M J J A S O N D	-	-	-	May-Oct	-
	Shortfin mako		-	General Distribution	J F M A M J J A S O N D	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec
124	Striped marlin		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	Jul-Oct
125	Dolphinfish		-	General Distribution	J F M A M J J A S O N D	-	-	-	Jan-Dec	Jan-Dec
126	Thresher shark		-	General Distribution	J F M A M J J A S O N D	-	-	-	Jan-Dec	Jan-Dec
127	Skipjack tuna		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	Sep-Nov
128	Swordfish		-	General Distribution	J F M A M J J A S O N D	-	-	-	Jan-Dec	Jan-Dec
129	Yellowfin tuna		-	General Distribution	J F M A M J J A S O N D	-	-	-	Jun-Sep	-
130	Bigeye tuna		-	General Distribution	J F M A M J J A S O N D	-	-	-	Jun-Nov	Jun-Nov

HERPETOFAUNA:

RAR#	Species	S F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)	Nesting	Hatching	Internest	Juveniles	Adults
120	Green sea turtle	T	-	General Distribution	J F M A M J J A S O N D	-	-	-	Jan-Dec	Jan-Dec
143	Loggerhead sea turtle	E	8 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	Aug-Jan	-
147	Leatherback sea turtle	E E	<1 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	Jul-Nov	Jul-Nov
168	Olive ridley sea turtle	E	Incidental	General Distribution	J F M A M J J A S O N D	-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATE:

RAR#	Species	S F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)	Spawning	Eggs	Larvae	Juveniles	Adults
135	California market squid		-	General Distribution	J F M A M J J A S O N D	Jan-Dec	-	Jan-Dec	Jan-Dec	Jan-Dec
137	Thysanoessa spinifera		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
138	Isada krill		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
	Krill spp.		-	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
174	Sunflower sea star		Low	General Distribution	J F M A M J J A S O N D	-	-	-	-	-
200	White abalone	E	-	General Distribution	J F M A M J J A S O N D	Feb-Apr	Feb-Apr	Feb-Apr	Jan-Dec	Jan-Dec

MARINE MAMMAL:

RAR#	Species	S F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)	Mating	Calving	Pupping	Molting
1	Blue whale	E	9-40 Per 10000 Sq Km	General Distribution	J A S O N	-	-	-	-
3	Blue whale	E	9-40 Per 10000 Sq Km	General Distribution	M A M J	-	-	-	-
5	Blue whale	E	2-9 Per 10000 Sq Km	General Distribution	M A M J	-	-	-	-
6	Blue whale	E	9-40 Per 10000 Sq Km	General Distribution	J F	-	-	-	-
8	Blue whale	E	2-9 Per 10000 Sq Km	General Distribution	J F	-	-	-	-
9	Bottlenose dolphin		5-3237 Per 1000Sqkm	General Distribution	J F M A M J J A S O N D	-	-	-	-
13	Fin whale	E	<6 Per 1000 Sq Km	General Distribution	J A S O N	-	-	-	-
14	Fin whale	E	6-20 Per 1000 Sq Km	General Distribution	J A S O N	-	-	-	-
15	Fin whale	E	<6 Per 1000 Sq Km	General Distribution	M A M J	-	-	-	-
16	Fin whale	E	6-20 Per 1000 Sq Km	General Distribution	M A M J	-	-	-	-
17	Fin whale	E	<6 Per 1000 Sq Km	General Distribution	J F	-	-	-	-
18	Fin whale	E	6-20 Per 1000 Sq Km	General Distribution	J F	-	-	-	-
20	Baird's beaked whale		0-1 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
21	Baird's beaked whale		1-14 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
99	Bryde's whale		5-8 Per 100000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
	North Pacific right whale	E	-	General Distribution	F M A M	-	-	-	-
	Sei whale	E	1 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
	Short-finned pilot whale		0-2 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
101	Killer whale		1-4 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
	Kogia spp.		2 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
102	California sea lion		13-17 Per 10 Sq Km	General Distribution	J F M A M J J A S O N D	Jun-Aug	-	May-Jun	-
104	Dall's porpoise		0-5 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
105	Dall's porpoise		5-9 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
118	Guadalupe fur seal	T T	3 Per 1000 Sq Km	General Distribution	J F M A M J J A S O N D	May-Aug	-	Jun-Aug	-
121	Gray whale		Reprod; Migratory	Migration	J F M A M J	-	Mar-May	-	-
139	Long-beaked common dolphin		16-522 Per 100 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
149	Minke whale		24-60 Per 10000Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
151	Minke whale		9-24 Per 10000 Sq Km	General Distribution	J F M A M J J A S O N D	-	-	-	-
153	Humpback whale	E	<3 Per 1000 Sq Km	General Distribution	J A S O N	-	-	-	-
155	Humpback whale	E	8-158 Per 1000 Sq Km	General Distribution	M A M J	-	-	-	-
157	Humpback whale	E	3-8 Per 1000 Sq Km	General Distribution	M A M J	-	-	-	-

Species Threatened/Endangered

Los Angeles/Long Beach California Offshore ESI: Biology Map 6 (cont.)

BIOLOGICAL RESOURCES: (cont.)

MARINE MAMMAL (cont.):

RAR#	Species	S	F	Concentration	Mapping Qualifier	Monthly Presence (Jan-Dec)												Mating	Calving	Pupping	Molting		
158	Humpback whale		E	8-158 Per 1000 Sq Km	General Distribution	J	F													-	-	-	-
160	Humpback whale		E	3-8 Per 1000 Sq Km	General Distribution	J	F													-	-	-	-
162	Northern elephant seal			9-16 Per 100 Sq Km	General Distribution	J	F													Dec-Feb	-	Dec-Feb	-
	Northern elephant seal			4-7 Per 100 Sq Km	General Distribution				M							S				Mar-Mar	-	Mar-Mar	-
163	Northern elephant seal			3-4 Per 100 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			Dec-Mar	-	Dec-Mar	-
166	Northern right-whale dolphin			0-4 Per 100 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			-	-	-	-
167	Northern right-whale dolphin			4-35 Per 100 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			-	-	-	-
169	Sperm whale		E	14-38 Per 10000Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			-	-	-	-
170	Sperm whale		E	<14 Per 10000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			-	-	-	-
171	Pacific white-sided dolphin			127-790 Per 1000Sqkm	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			-	-	-	-
173	Pacific white-sided dolphin			3-127 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			-	-	-	-
175	Risso's dolphin			7-179 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			-	-	-	-
181	Short-beaked common dolphin			17-42 Per 10 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			-	-	-	-
185	Goose-beaked whales			0-3 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			-	-	-	-
	Mesoplodont beaked whales			0-3 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			-	-	-	-
194	Steller sea lion			2-3 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			Jun-Aug	-	Jun-Aug	-
195	Steller sea lion			<1 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			-	-	-	-
198	Striped dolphin			0-9 Per 1000 Sq Km	General Distribution	J	F	M	A	M	J	J	A	S	O	N	D			-	-	-	-

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