Sanctuary Ecologically Significant Area (SESA)

SESA 14: Partington & Lucia Canyons

Description

SESA 14 includes portions of Partington and Lucia Canyon systems and is adjacent to the Big Creek State Marine Conservation Area (SMCA) and State Marine Reserve (SMR). It contains soft bottom habitat inside and outside canyons between 466-903 m resulting in relatively low habitat richness (4 habitats) and diversity (index=2.41). There has not been much research or monitoring in this SESA; most of the research in this portion of MBNMS is occurring in shallower waters closer to shore. There are a few records of structure-forming invertebrates (e.g., gorgonians, sea pens) from ROV surveys and groundfish trawl surveys, but sampling effort is very limited. The upwelling zone at Point Sur overlaps the northern half of the SESA; upwelled water may be advected through the SESA during the upwelling season. Intermediate levels of primary productivity are observed. This SESA is located within MBNMS, and research activities may require a permit (http://montereybay.noaa.gov/resourcepro/permit/permits_need.html).

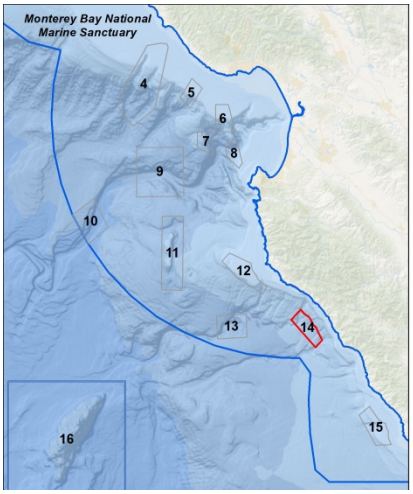

Figure 1. The location of SESA 14 and twelve additional SESAs in Monterey Bay National Marine Sanctuary. Credit: Chad King/MBNMS.

Resource Management Issues

SESA 14 has been used as commercial fishing grounds and also contains proposed demersal fishes conservation area.

- Adjacent to State MPAs: Big Creek SMR and SMCA
- Commercial bottom trawl
- Adjacent to commercial benthic fixed gear
- Essential Fish Habitat (EFH) Conservation Area
- EFH bottom trawl closure proposed (2013)
- Recreational fishing
- Leatherback sea turtle critical habitat

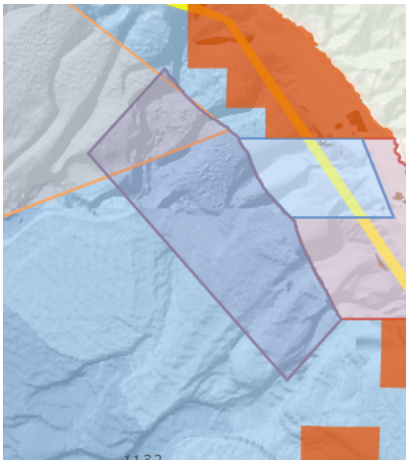
Figure 2. Close-up map of SESA 14. Grey border=SESA boundary; yellow=Rockfish Conservation Area; orange= commercial benthic fixed gear dominant use; light orange border=EFH Conservation Area; light blue border=State MPA. Source: SESAs Interactive Map, http://sanctuarymonitoring.org/maps/sesa/.

Living Marine Resources & Uses

Table 1. Species known to occur within SESA 14: Partington & Lucia Canyons.

Invertebrates	-soft corals† (Alcyonacea), e.g., mushroom soft coral (*Heteropolypus ritteri)*, gorgonians, *Swiftia* spp., Primnoidae -sea pens† (Pennatulacea), e.g., *Umbellula lindahli*, *Halipteris californica* (MBARI VARS imagery; NMFS West Coast Bottom Trawl Groundfish Survey)
Fishes	Not sampled; *Found nearby:* -Pacific Hake (*Merluccius productus*) -rockfishes (*Sebastes* spp.), e.g., Pygmy, Blue, Copper, Yelloweye², Gopher, Halfbanded, Olive, Rosy, Rosethorn, Squarespot, Greenspotted, Bank, Darkbotched², Vermilion -Longspine Thornyhead (*Sebastolobus altivelis*) -Sablefish *(Anoplopoma fimbria*) -Sharpnose Seaperch (*Phanerodon atripes*) -Señorita (*Oxyjulis californica*) -Blackeye Goby (*Rhinogobiops nicholsii*) -Rex Sole (*Glyptocephalus zachirus*) -Slender Sole (*Lyopsetta exilis*) -Dover Sole (*Microstomus pacificus*) (MBNMS 2013; adjacent MPA, Yoklavich et al. 2002)
Marine birds	-Northern Fulmar (*Fulmarus glacialis*) -California Brown Pelican (*Pelecanus occidentalis californicus*) -Brandt's Cormorant (*Phalacrocorax penicillatus*) -California Gull (*Larus californicus*), Western Gull (*L. occidentalis*) -Common Murre (*Uria aalge*) -Rhinoceros Auklet (*Cerorhinea monocerata*) (Ainley et al. 2012)
Marine mammals	-humpback whale¹ (*Megaptera novaeangliae*) -gray whale (*Eschrichtius robustus*) -dolphins (Odontoceti), e.g., Northern right-whale dolphin (*Lissodelphis borealis*), Risso's dolphin (*Grampus griseus*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) -seals (Phocidae), e.g., harbor seal (*Phoca vitulina*), Northern elephant seal (*Mirounga angustirostris*) -California sea lion (*Zalophus californianus*) (NOAA, 2003)
Marine reptiles	-leatherback sea turtle¹ (*Dermochelys coriacea*) (NOAA, 2003)

Special Status Species: Endangered¹, Overfished²;
Biogenic habitat†

Diverse or productive communities:

- moderate primary productivity
- low krill production
- marine mammal high diversity

Migration, breeding, or foraging areas:

- 100% in leatherback sea turtle NMFS critical habitat

Research

SIMoN projects:

CSCAPE: Collaborative Survey of Cetacean Abundance and the Pelagic Ecosystem (2005-07)
http://sanctuarysimon.org/projects/100273/cscape%3a--collaborative-survey-of-cetacean-abundance-and-the-pelagic-ecosystem.
Monitoring whales by Cascadia Research Collective (1991-current)
http://sanctuarymonitoring.org/projects/100152/monitoring-whales-by-cascadia-research-collective
Sea Turtle Restoration Project: Leatherback Watch Program (2010-current)
http://sanctuarymonitoring.org/projects/100395/sea-turtle-restoration-project%3a-leatherback-watch-program-
Structure of Populations, Levels of Abundance and Status of Humpbacks (SPLASH) (2004- current)
http://sanctuarymonitoring.org/projects/100224/structure-of-populations%2c-levels-of-abundance-and-status-of-humpbacks-%28splash%29
Tagging of Pacific Predators (TOPP) (2000-current)
http://sanctuarymonitoring.org/projects/100137/tagging-of-pacific-predators-%28topp%29
Tracking Black-footed Albatross Movements and Conservation (2004-2008)
http://sanctuarysimon.org/projects/100305/tracking-black-footed-albatross-movements-and-conservation
Underwater Behavior of Large Whales Using Suction-cup Attached Tags (2000-current)
http://sanctuarymonitoring.org/projects/100153/underwater-behavior-of-large-whales-using-suction-cup-attached-tags
usSEABED: A USGS Pacific Coast Offshore Surficial Sediment Data and Mapping Project (2005-current)
http://sanctuarymonitoring.org/projects/100247/usseabed%3a-a-usgs-pacific-coast-offshore-surficial-sediment-data-and-mapping-project

Monitoring stations and/or data collection instruments:

- NMFS West Coast Bottom Trawl Groundfish Survey

MBNMS research: None

Science Needs & Research Questions

Habitat Characterization of the Continental Slope
http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_characterization_slope.pdf
- What are the distribution and abundance of organisms and habitats on the continental slope?
- How do corals and chemosynthetic communities on the continental slope provide biogenic habitat for other species?

Human Health - Harmful Algal Blooms
http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_habs.pdf
- How do HABs affect local species populations?

Impacts on Whales from Human Uses
http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_whale_science.pdf
- What are the spatial and temporal patterns of habitat use of large whales throughout sanctuary waters (both inshore and offshore)?

Landslide Management
http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_landslide_mgmt_bigsur.pdf
- Where have historic accumulations of slide debris dispersed to, and where might debris be transported within the marine environment in the future?

Socioeconomics and the Human Dimension

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_socioeconomics.pdf

- How do we determine the overall impact of multiple human activities, some with negative and some with positive, influence on Sanctuary resources?

Water Quality Integrated Analyses

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_water_quality.pdf

- Determine and implement the necessary monitoring to assess the condition of water quality in the Sanctuary.

SESAs Interactive Map: http://sanctuarysimon.org/maps/sesa

Publically Available Imagery: None

SESA Data Layers

Table 2. The 13 SESAs of the MBNMS are comprised of a variety of biological and environmental characteristics that describe unique pelagic and benthic deep sea communities. Listed are a subset of these qualities which include habitat diversity (Shannon-Wiener diversity index); hard substrate area coverage (%); the most common type of habitat; the presence and abundances of corals and sponges, demersal fishes, and marine birds; and the area coverage (%) of upwelling zone within each SESA. Sources: Draft MBNMS report in preparation; SESAs Interactive Map, http://sanctuarymonitoring.org/maps/sesa/.

SESA	Habitat diversity (H')	Hard substrate (%)	Primary habitat	Corals & sponges	Demersal fishes	Marine birds	Upwelling zone (%)
4	5.43	8%	Slope 2 soft canyon	yes-high	yes-high	yes-high	yes-50%
5	6.13	19%	Slope 1 Soft Canyon	yes- high	yes-med	yes-med	yes-100%
6	6.62	13%	Shelf Break soft	yes-high	yes-low	yes-med	no
7	3.52	9%	Slope 2 soft canyon	yes-med	yes-high	yes-med	no
8	5.32	33%	Slope 2 soft canyon	yes-med	yes-med	yes-high	no
9	2.34	5%	Slope 2 soft canyon	yes-high	yes-high	yes-low	no
10	3.23	1%	Rise soft canyon	yes-med	not sampled	yes-low	no
11	1.56	16%	Slope 2 soft	yes-med	yes-high	yes-low	no
12	4.17	32%	Shelf hard	yes-med	yes-high	yes-med	yes-50%
13	2.00	0%	Slope 2 soft	yes-low	not sampled	yes-low	no
14	2.41	0%	Slope 1 Soft	yes-med	yes-high	yes-med	yes-50%
15	5.31	18%	Shelf Break soft	yes-med	yes-med	yes-med	yes-25%
16	3.12	73%	Slope 2 hard	yes-high	yes-high	yes-low	no

Selected Publications

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Brown JA, Burton EJ, De Beukelaer S. 2013. The Natural Resources of Monterey Bay National Marine Sanctuary: A Focus on Federal Waters. Marine Sanctuaries Conservation Series ONMS-13-05. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 264 pp. Available at: http://montereybay.noaa.gov/research/techreports/trbrown2013.html

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Leeworthy VR, Jerome D, Schueler K. 2014. Economic Impact of the Commercial Fisheries on Local County Economies from Catch in All California National Marine Sanctuaries 2010, 2011 and 2012. Marine Sanctuaries Conservation Series ONMS-14-03. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 46pp. Available at: http://montereybay.noaa.gov/research/techreports/trleeworthy2014.html

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Maier KL, Fildani A, Paull CK, Graham SA, McHargue TR, Caress DW, McGann M. 2011. The Elusive Character of Discontinuous Deep-Water Channels: New Insights from Lucia Chica Channel System, Offshore California. *Geology*, 39(4), 327-330. http://montereybay.noaa.gov/research/techreports/trmaier2011.html

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Monterey Bay Aquarium Research Institute (MBARI). 2015. *Video Annotation and Reference System (VARS)*. World Wide Web electronic publication. [http://www.mbari.org/vars/, version 7/27/15]. Accessed [08/01/15].

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