

Appendix M. Maps

GIS Support for the NFMP, May 2001, California Department of Fish and Game, Marine Region

Overview and Objectives of Maps

Maps were compiled for the purpose of providing GIS support for the Chapters written for the NFMP document. Some maps were modified from existing projects and studies to fit the black and white, 8.5- by 11-inch format of this document. Other maps were created specifically for individual chapters. Maps should be used within the context of the NFMP document. All GIS data were analyzed and compiled by the GIS Lab of the Department.

Section 1

Chapter 2 - Description of Stocks

Maps in this section are a series of common ranges of 19 species of nearshore finfish. Species for this section include:

- Black rockfish (6-1)
- Black-and-yellow rockfish (6-2)
- Blue rockfish (6-3)
- Brown rockfish (6-4)
- Cabazon (6-5)
- Calico rockfish (6-6)
- California scorpionfish (6-7)
- California sheephead (6-8)
- China rockfish (6-9)
- Copper rockfish (6-10)
- Gopher rockfish (6-11)
- Grass rockfish (6-12)
- Kelp greenling (6-13)
- Kelp rockfish (6-14)
- Monkeyface prickleback (6-15)
- Olive rockfish (6-16)
- Quillback rockfish (6-17)
- Rock greenling (6-18)
- Treefish (6-19)

Description of the Fishery

There are two maps in this chapter depicting major marine ports and headlands. Maps are divided into Northern to Central (3-1) and Central to Southern (3-2). These provide geographic location and distribution of major marine ports and headlands that are referenced in this section.

History of the Conservation and Management Measures

Cowcod closure areas

The Southern California region shows locations and extents of cowcod closure areas (5-1)

Marine protected areas that affect nearshore finfish

A series of three maps (5-2 through 5-4) of California's coastal region depicts various marine protected areas that are important to nearshore finfish. Recreational and commercial fishing restrictions are labeled for each MPA.

Chapter 3 - Fishery Management Program

Ecological boundaries

California's marine ecological boundaries (2-1) are based on the oceanic environment and regional management subdivision. Ecological boundaries are shown to be at:

- Oregon border
- Cape Mendocino
- Point Conception
- Mexican Border

Range distribution maps

Black rockfish (2-2 and 2-3) and sheephead (2-4) maps are examples of common range distribution of NFMP species along California's waters.

General

Marine districts

Refer to G-1.

Gill and trammel net restrictions in the central cost region

Refer to G-2.

Fishery charts

Three maps show California divided into northern, central, and southern fishery regions (G-3 through G-5).

Section 2

Environmental Settings

One map depicts geographic reference points in this chapter (8-1).

Consideration and Discussion of Environmental Impacts

Maps in this section are a series of common range extents of seabirds listed in this section. These include:

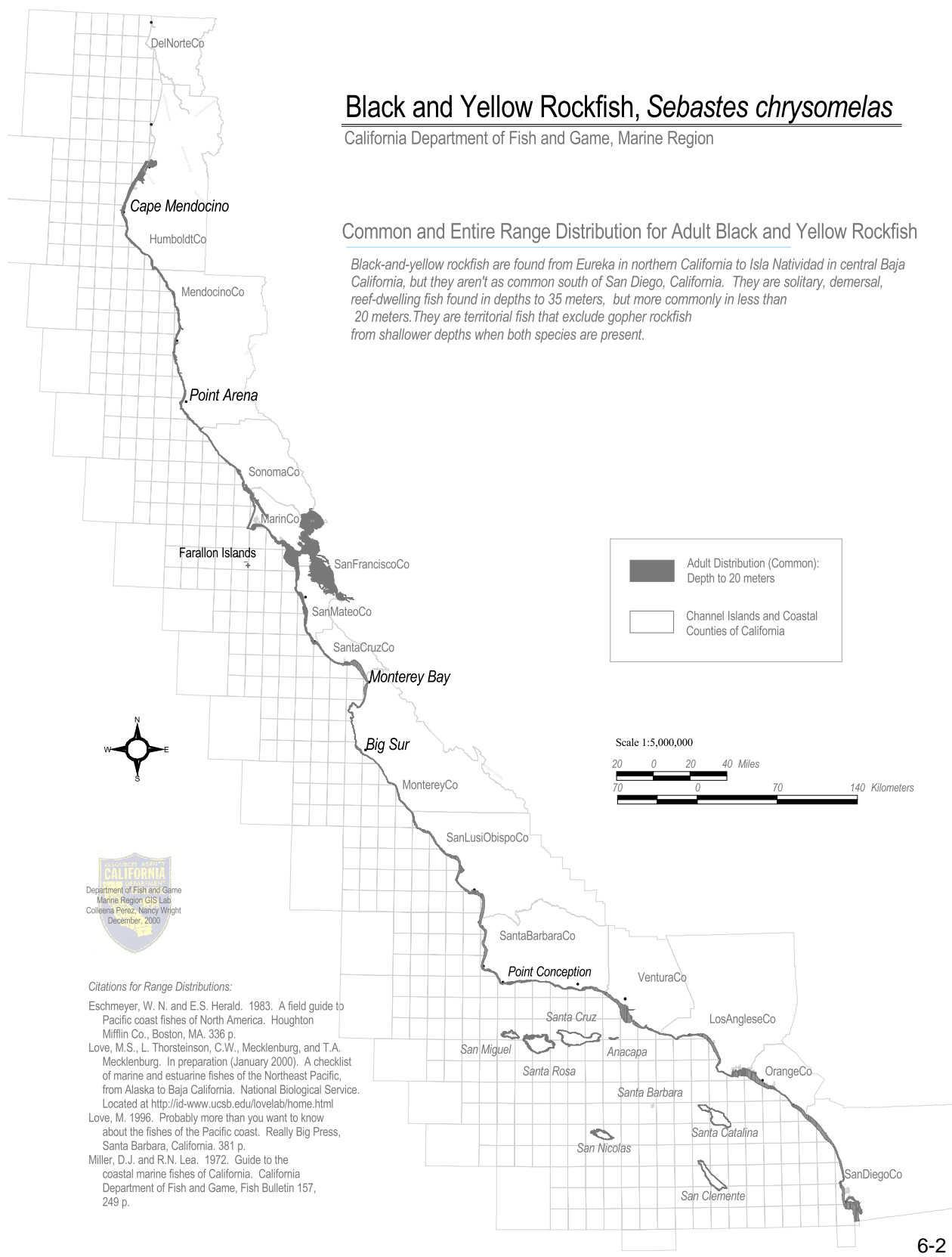
- Ashy storm-petrel (7-1)
- Black storm-petrel (7-2)
- California brown pelican (7-3)
- California gull (7-4)
- Common murre (7-5)
- Cormorants: Brandt's; Double-crested; Pacific (7-6)
- Elegant tern (7-7)
- Fork-tailed storm-petrel (7-8)
- Loons: Common; Pacific (7-9)
- Marbled murrelet (7-10)
- Rhinoceros auklet (7-11)
- Tufted puffin (7-12)
- Western grebe (7-13)
- Xantus murrelet (7-14)

Black and Yellow Rockfish, *Sebastes chrysomelas*

California Department of Fish and Game, Marine Region

Common and Entire Range Distribution for Adult Black and Yellow Rockfish

Black-and-yellow rockfish are found from Eureka in northern California to Isla Natividad in central Baja California, but they aren't as common south of San Diego, California. They are solitary, demersal, reef-dwelling fish found in depths to 35 meters, but more commonly in less than 20 meters. They are territorial fish that exclude gopher rockfish from shallower depths when both species are present.

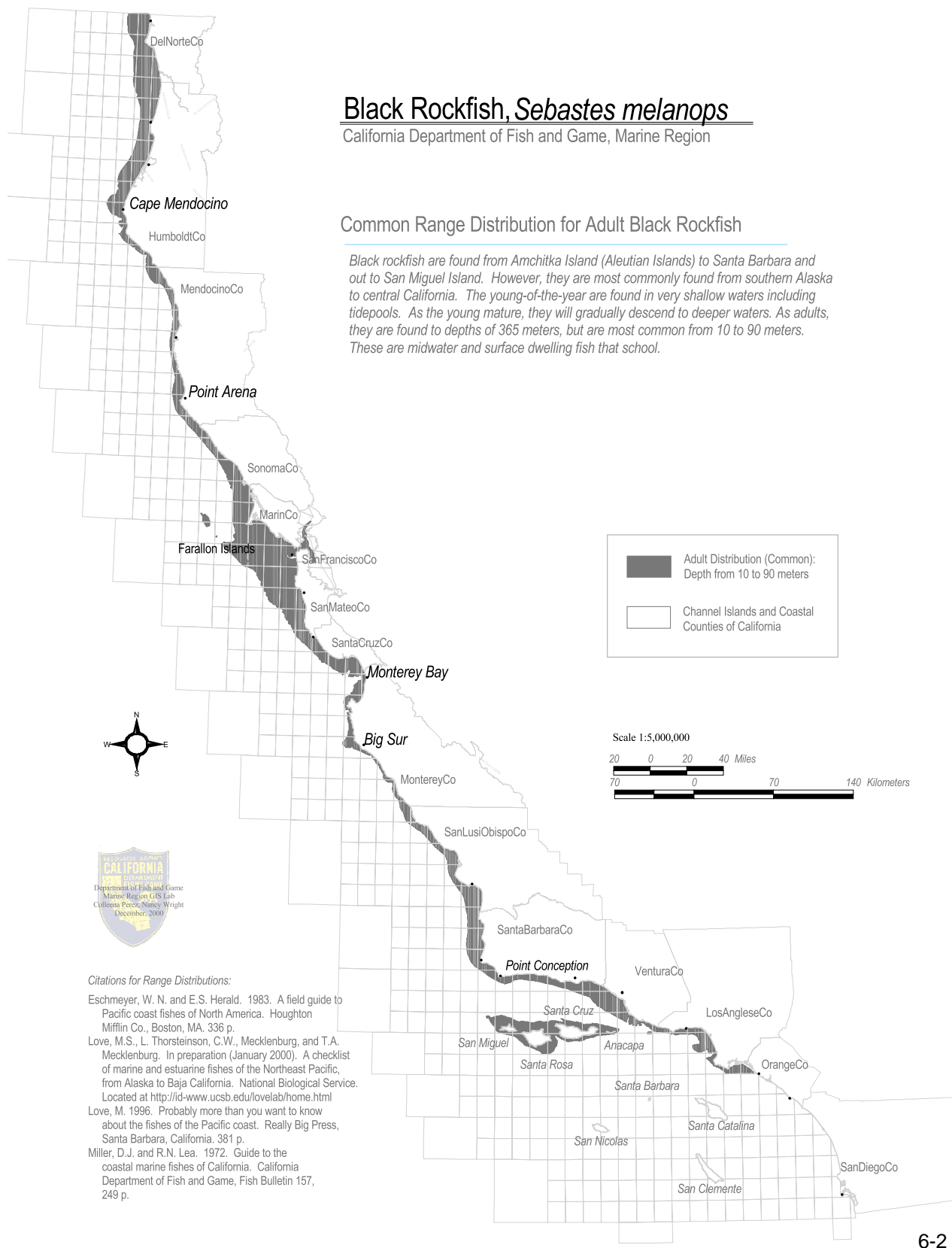


Black Rockfish, *Sebastes melanops*

California Department of Fish and Game, Marine Region

Common Range Distribution for Adult Black Rockfish

Black rockfish are found from Amchitka Island (Aleutian Islands) to Santa Barbara and out to San Miguel Island. However, they are most commonly found from southern Alaska to central California. The young-of-the-year are found in very shallow waters including tidepools. As the young mature, they will gradually descend to deeper waters. As adults, they are found to depths of 365 meters, but are most common from 10 to 90 meters. These are midwater and surface dwelling fish that school.



Citations for Range Distributions:

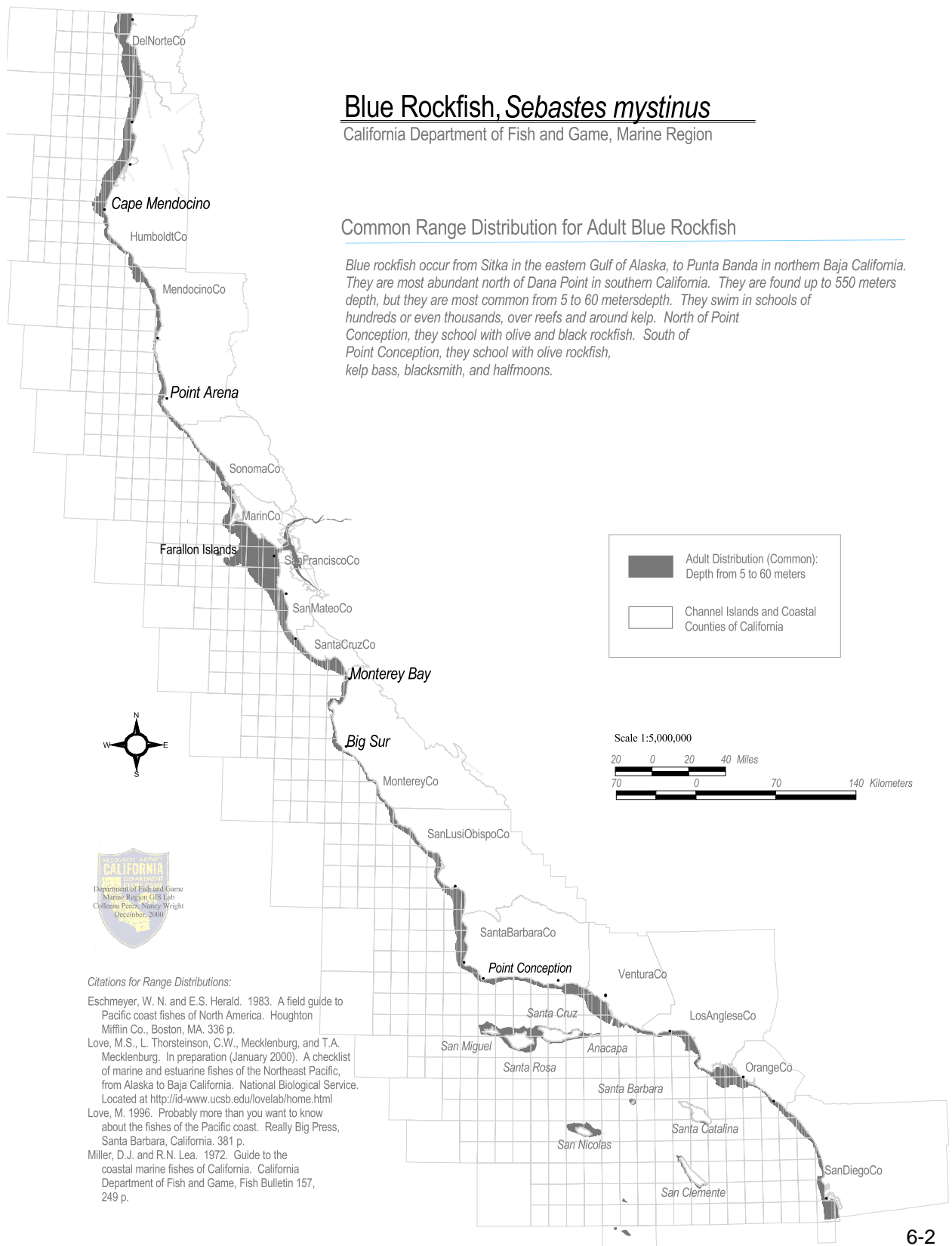
- Eschmeyer, W. N. and E.S. Herald. 1983. A field guide to Pacific coast fishes of North America. Houghton Mifflin Co., Boston, MA, 336 p.
- Love, M.S., L. Thorsteinson, C.W. Mecklenburg, and T.A. Mecklenburg. In preparation (January 2000). A checklist of marine and estuarine fishes of the Northeast Pacific, from Alaska to Baja California. National Biological Service. Located at <http://iid-www.ucsb.edu/lovelab/home.html>
- Love, M. 1996. Probably more than you want to know about the fishes of the Pacific coast. Really Big Press, Santa Barbara, California. 381 p.
- Miller, D.J. and R.N. Lea. 1972. Guide to the coastal marine fishes of California. California Department of Fish and Game, Fish Bulletin 157, 249 p.

Blue Rockfish, *Sebastes mystinus*

California Department of Fish and Game, Marine Region

Common Range Distribution for Adult Blue Rockfish

Blue rockfish occur from Sitka in the eastern Gulf of Alaska, to Punta Banda in northern Baja California. They are most abundant north of Dana Point in southern California. They are found up to 550 meters depth, but they are most common from 5 to 60 meters depth. They swim in schools of hundreds or even thousands, over reefs and around kelp. North of Point Conception, they school with olive and black rockfish. South of Point Conception, they school with olive rockfish, kelp bass, blacksmith, and halfmoons.

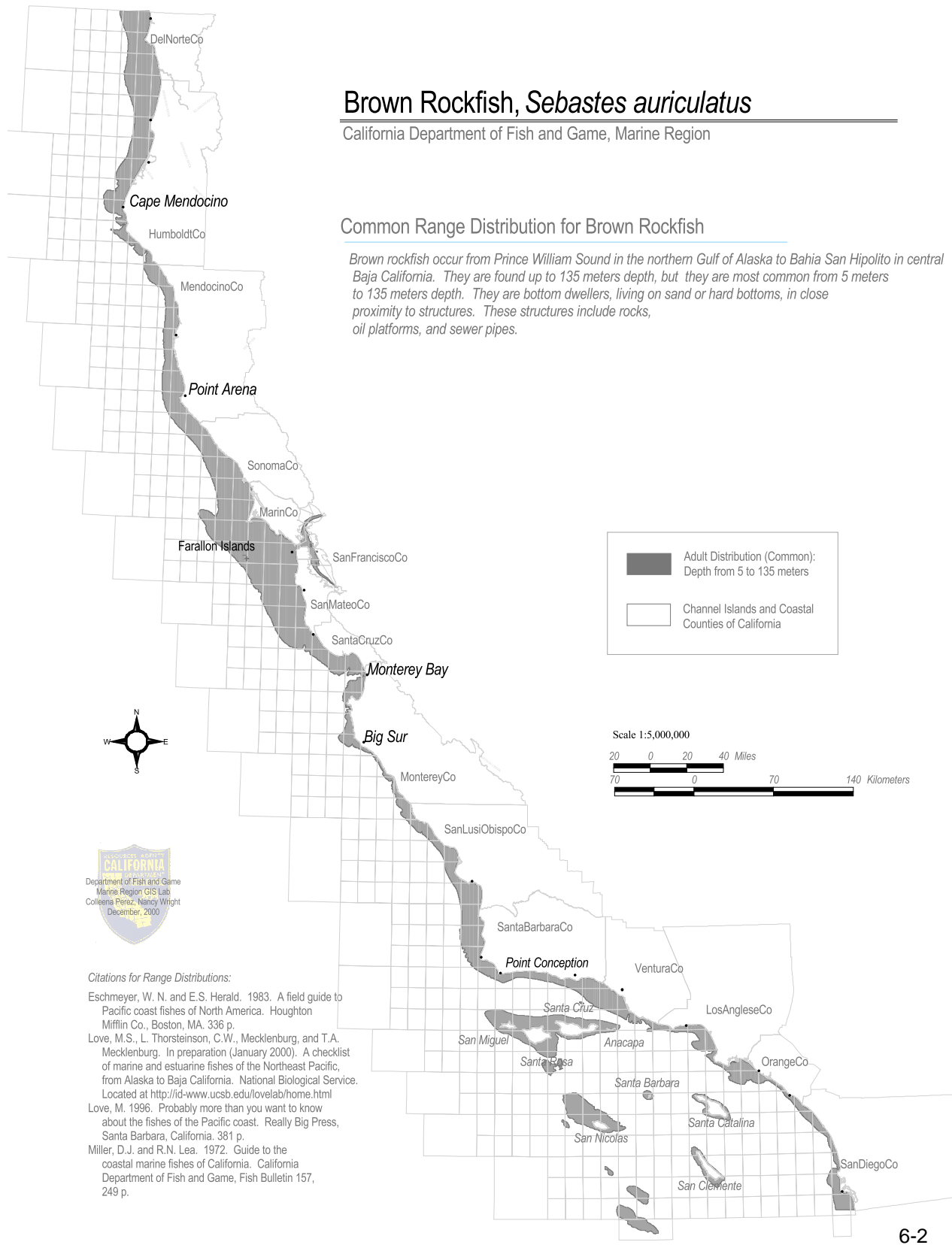


Brown Rockfish, *Sebastes auriculatus*

California Department of Fish and Game, Marine Region

Common Range Distribution for Brown Rockfish

Brown rockfish occur from Prince William Sound in the northern Gulf of Alaska to Bahia San Hipolito in central Baja California. They are found up to 135 meters depth, but they are most common from 5 meters to 135 meters depth. They are bottom dwellers, living on sand or hard bottoms, in close proximity to structures. These structures include rocks, oil platforms, and sewer pipes.

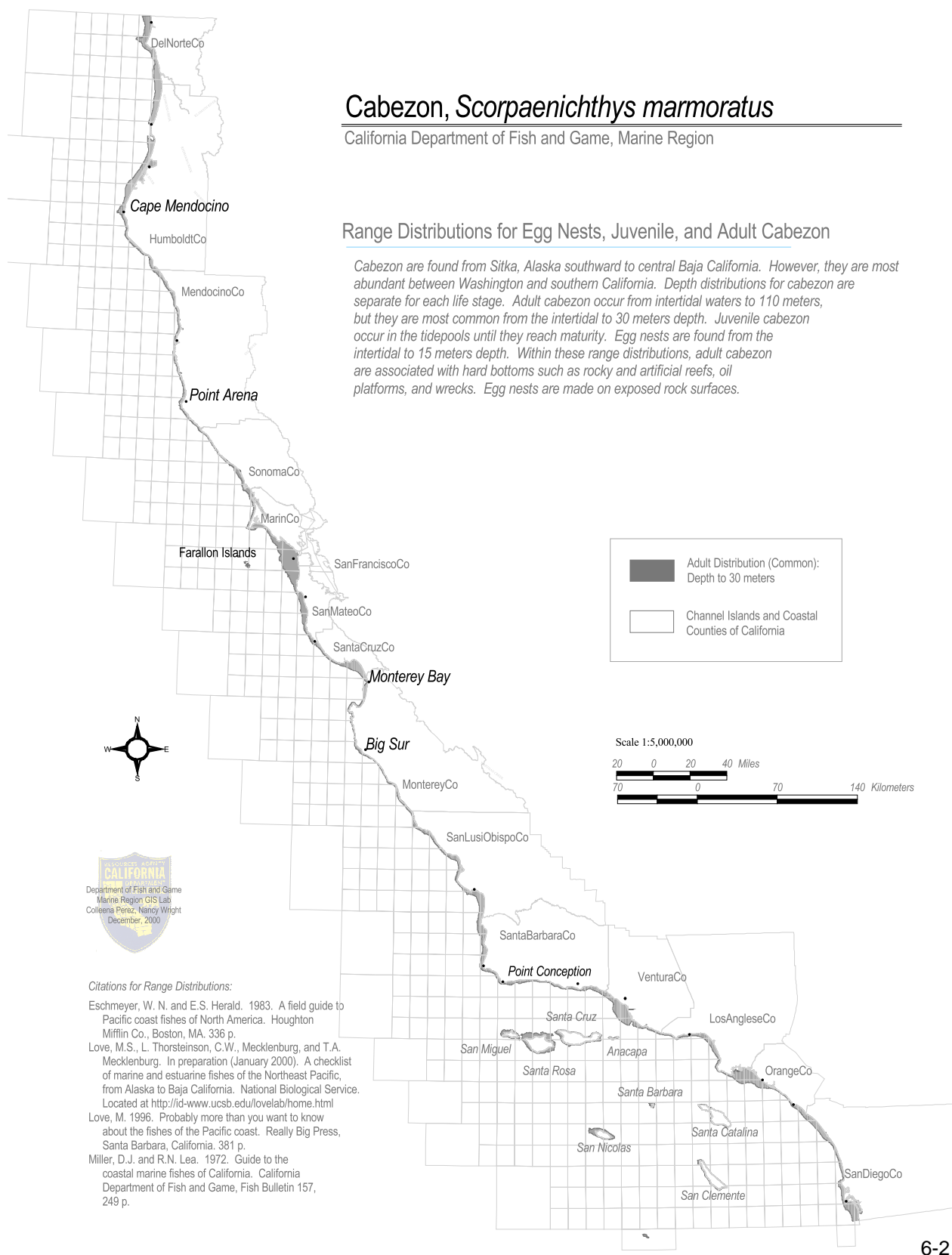


Cabezon, *Scorpaenichthys marmoratus*

California Department of Fish and Game, Marine Region

Range Distributions for Egg Nests, Juvenile, and Adult Cabezon

Cabezon are found from Sitka, Alaska southward to central Baja California. However, they are most abundant between Washington and southern California. Depth distributions for cabezon are separate for each life stage. Adult cabezon occur from intertidal waters to 110 meters, but they are most common from the intertidal to 30 meters depth. Juvenile cabezon occur in the tidepools until they reach maturity. Egg nests are found from the intertidal to 15 meters depth. Within these range distributions, adult cabezon are associated with hard bottoms such as rocky and artificial reefs, oil platforms, and wrecks. Egg nests are made on exposed rock surfaces.

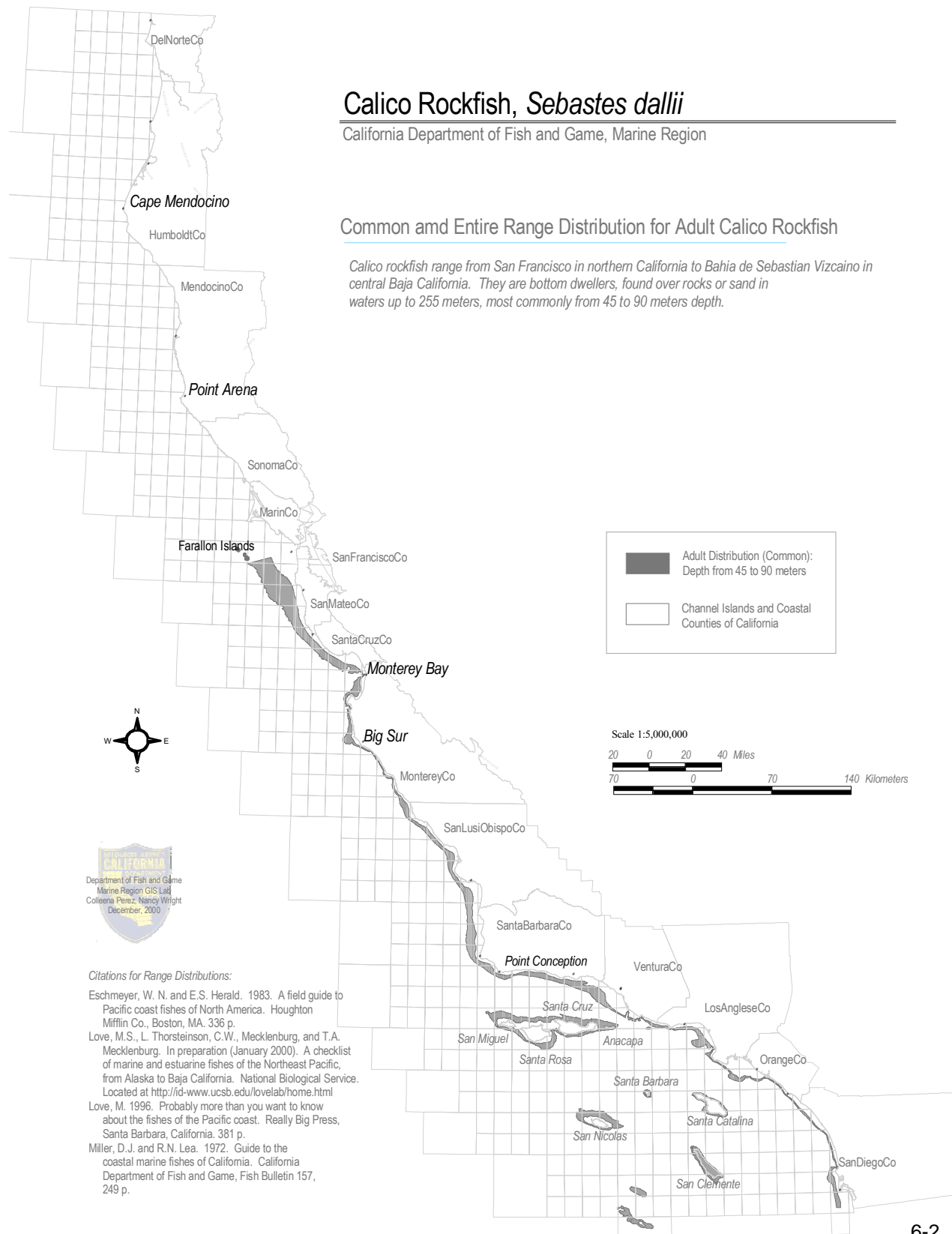


Calico Rockfish, *Sebastes dallii*

California Department of Fish and Game, Marine Region

Common and Entire Range Distribution for Adult Calico Rockfish

Calico rockfish range from San Francisco in northern California to Bahia de Sebastian Vizcaino in central Baja California. They are bottom dwellers, found over rocks or sand in waters up to 255 meters, most commonly from 45 to 90 meters depth.

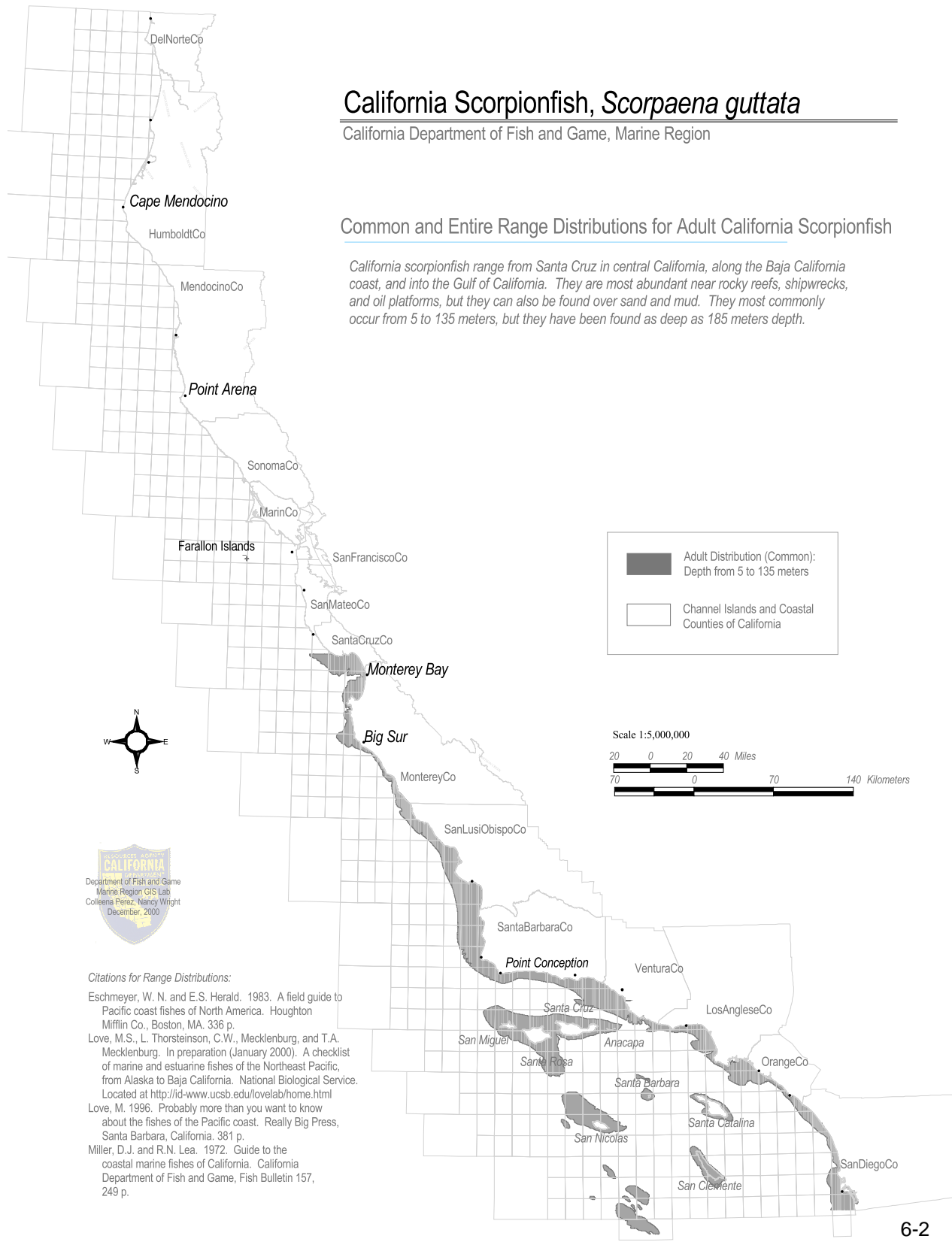


California Scorpionfish, *Scorpaena guttata*

California Department of Fish and Game, Marine Region

Common and Entire Range Distributions for Adult California Scorpionfish

California scorpionfish range from Santa Cruz in central California, along the Baja California coast, and into the Gulf of California. They are most abundant near rocky reefs, shipwrecks, and oil platforms, but they can also be found over sand and mud. They most commonly occur from 5 to 135 meters, but they have been found as deep as 185 meters depth.

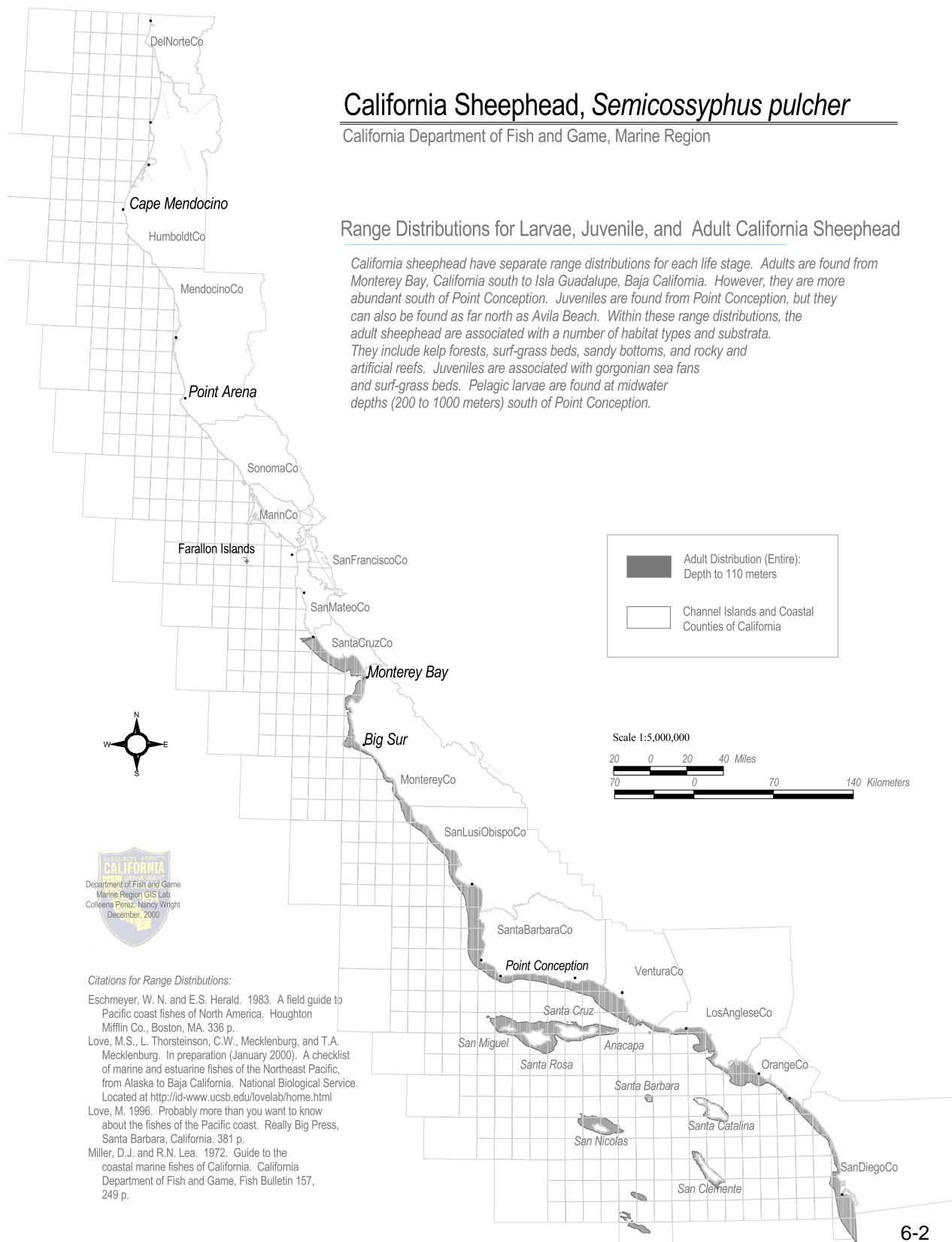


California Sheephead, *Semicossyphus pulcher*

California Department of Fish and Game, Marine Region

Range Distributions for Larvae, Juvenile, and Adult California Sheephead

California sheephead have separate range distributions for each life stage. Adults are found from Monterey Bay, California south to Isla Guadalupe, Baja California. However, they are more abundant south of Point Conception. Juveniles are found from Point Conception, but they can also be found as far north as Avila Beach. Within these range distributions, the adult sheephead are associated with a number of habitat types and substrata. They include kelp forests, surf-grass beds, sandy bottoms, and rocky and artificial reefs. Juveniles are associated with gorgonian sea fans and surf-grass beds. Pelagic larvae are found at midwater depths (200 to 1000 meters) south of Point Conception.

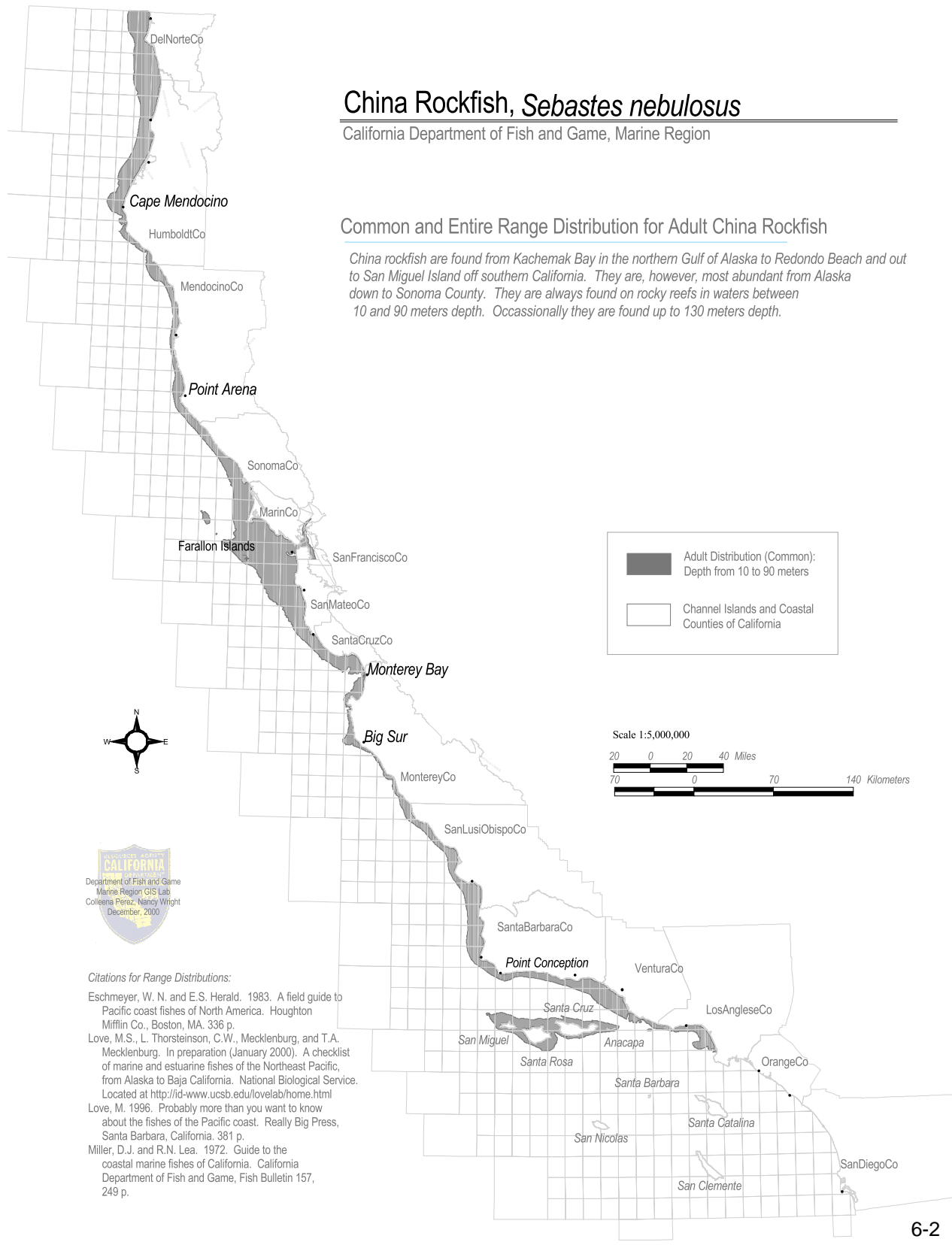


China Rockfish, *Sebastes nebulosus*

California Department of Fish and Game, Marine Region

Common and Entire Range Distribution for Adult China Rockfish

China rockfish are found from Kachemak Bay in the northern Gulf of Alaska to Redondo Beach and out to San Miguel Island off southern California. They are, however, most abundant from Alaska down to Sonoma County. They are always found on rocky reefs in waters between 10 and 90 meters depth. Occasionally they are found up to 130 meters depth.

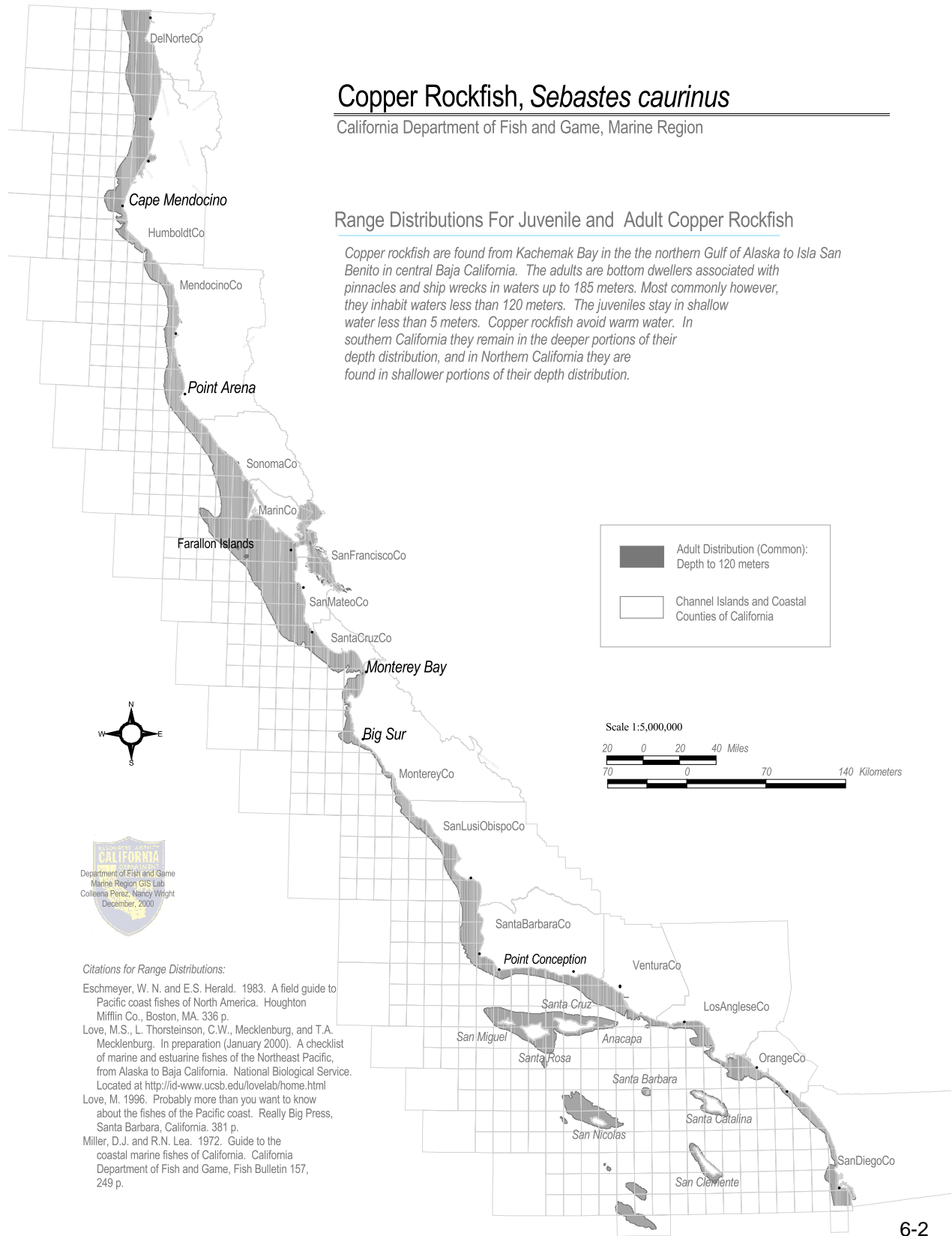


Copper Rockfish, *Sebastes caurinus*

California Department of Fish and Game, Marine Region

Range Distributions For Juvenile and Adult Copper Rockfish

Copper rockfish are found from Kachemak Bay in the northern Gulf of Alaska to Isla San Benito in central Baja California. The adults are bottom dwellers associated with pinnacles and ship wrecks in waters up to 185 meters. Most commonly however, they inhabit waters less than 120 meters. The juveniles stay in shallow water less than 5 meters. Copper rockfish avoid warm water. In southern California they remain in the deeper portions of their depth distribution, and in Northern California they are found in shallower portions of their depth distribution.

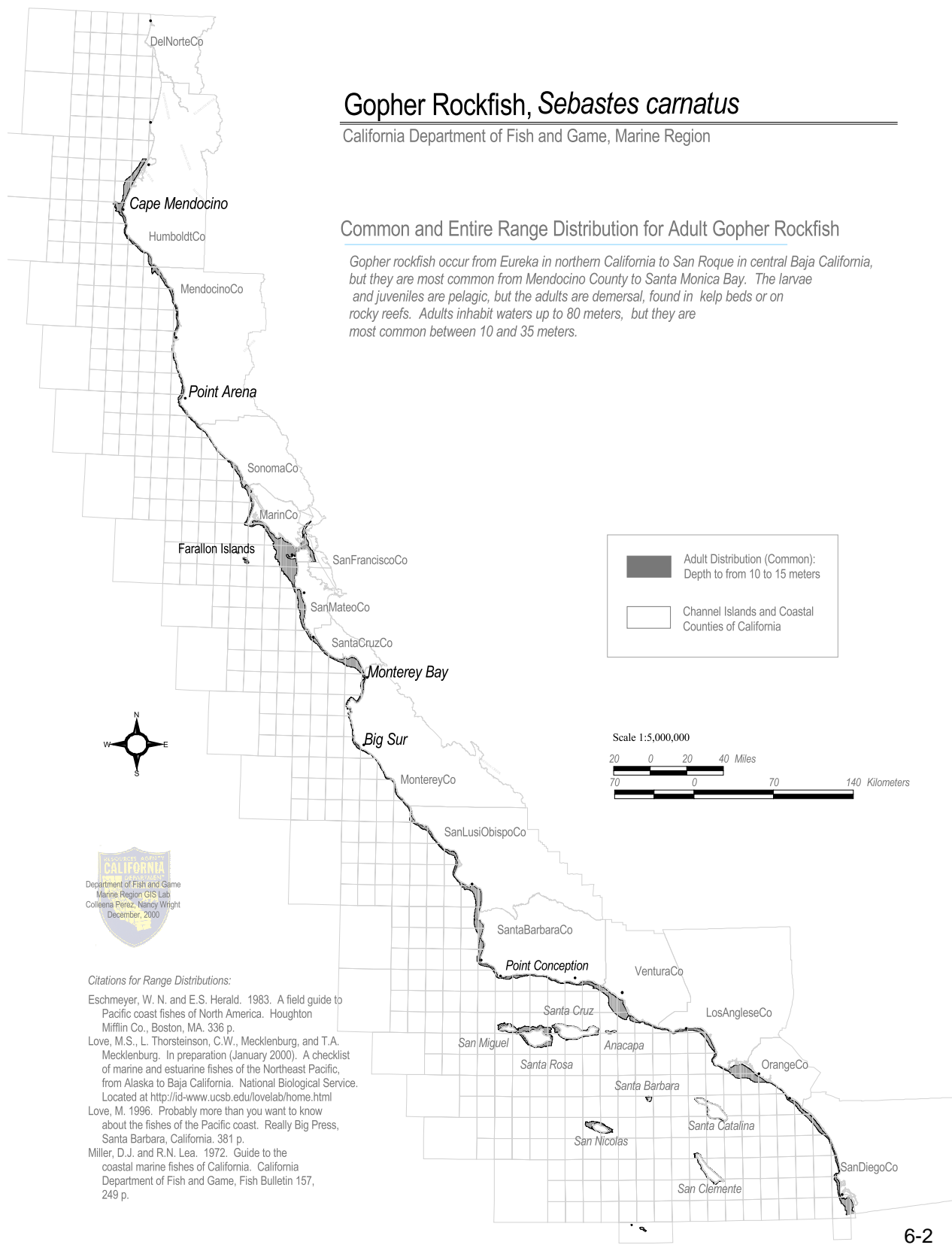


Gopher Rockfish, *Sebastes carnatus*

California Department of Fish and Game, Marine Region

Common and Entire Range Distribution for Adult Gopher Rockfish

Gopher rockfish occur from Eureka in northern California to San Roque in central Baja California, but they are most common from Mendocino County to Santa Monica Bay. The larvae and juveniles are pelagic, but the adults are demersal, found in kelp beds or on rocky reefs. Adults inhabit waters up to 80 meters, but they are most common between 10 and 35 meters.

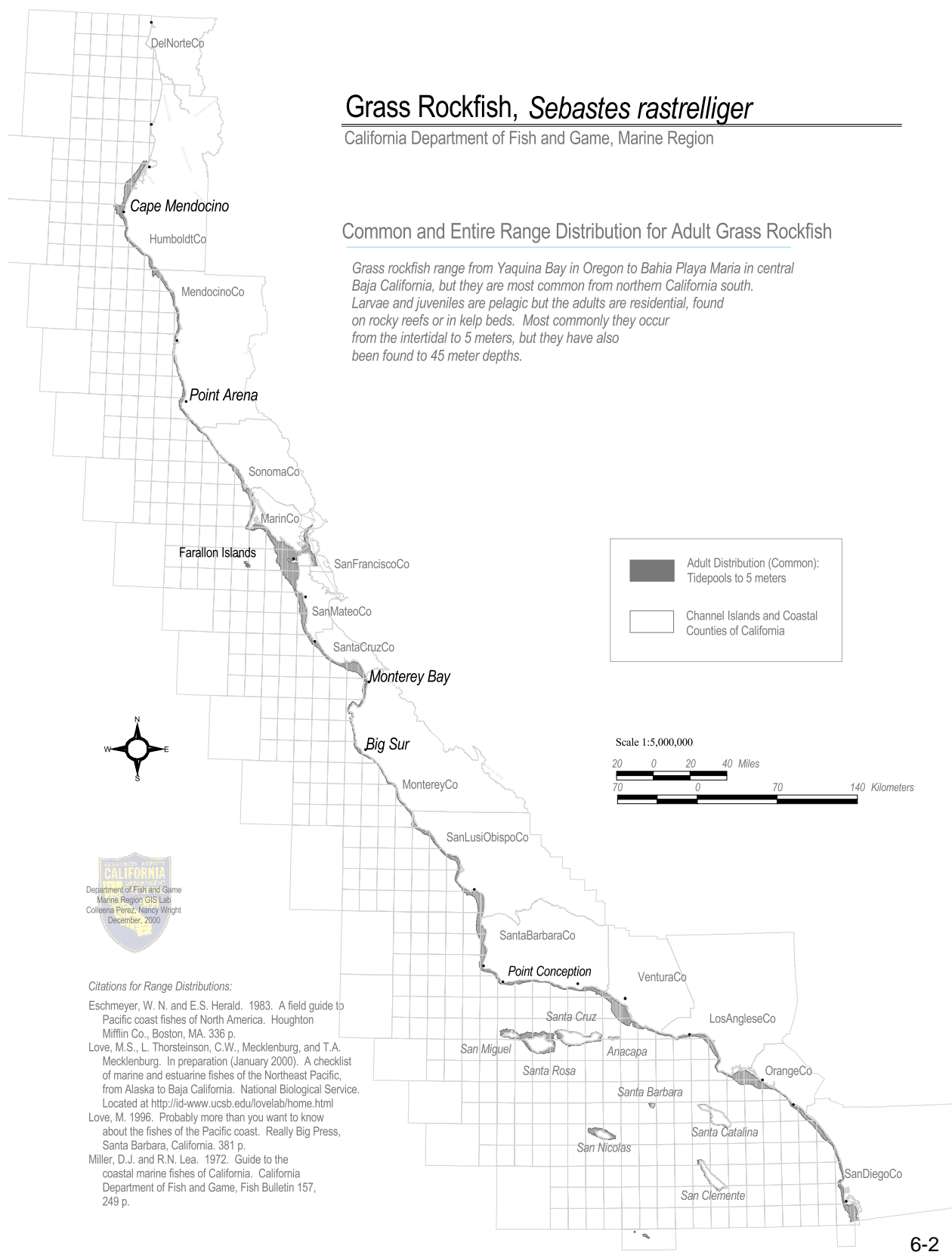


Grass Rockfish, *Sebastes rastrelliger*

California Department of Fish and Game, Marine Region

Common and Entire Range Distribution for Adult Grass Rockfish

Grass rockfish range from Yaquina Bay in Oregon to Bahia Playa Maria in central Baja California, but they are most common from northern California south. Larvae and juveniles are pelagic but the adults are residential, found on rocky reefs or in kelp beds. Most commonly they occur from the intertidal to 5 meters, but they have also been found to 45 meter depths.

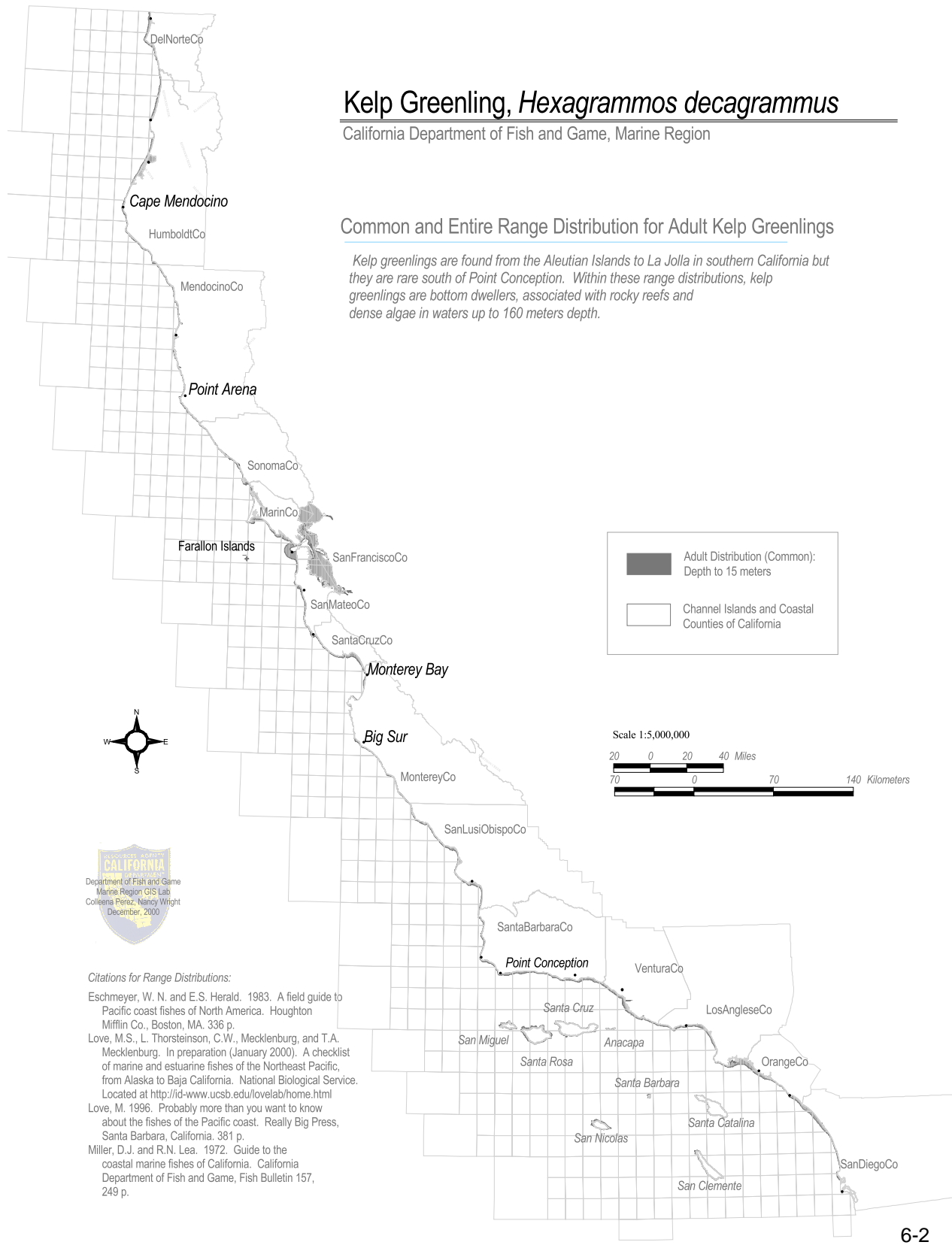


Kelp Greenling, *Hexagrammos decagrammus*

California Department of Fish and Game, Marine Region

Common and Entire Range Distribution for Adult Kelp Greenlings

Kelp greenlings are found from the Aleutian Islands to La Jolla in southern California but they are rare south of Point Conception. Within these range distributions, kelp greenlings are bottom dwellers, associated with rocky reefs and dense algae in waters up to 160 meters depth.

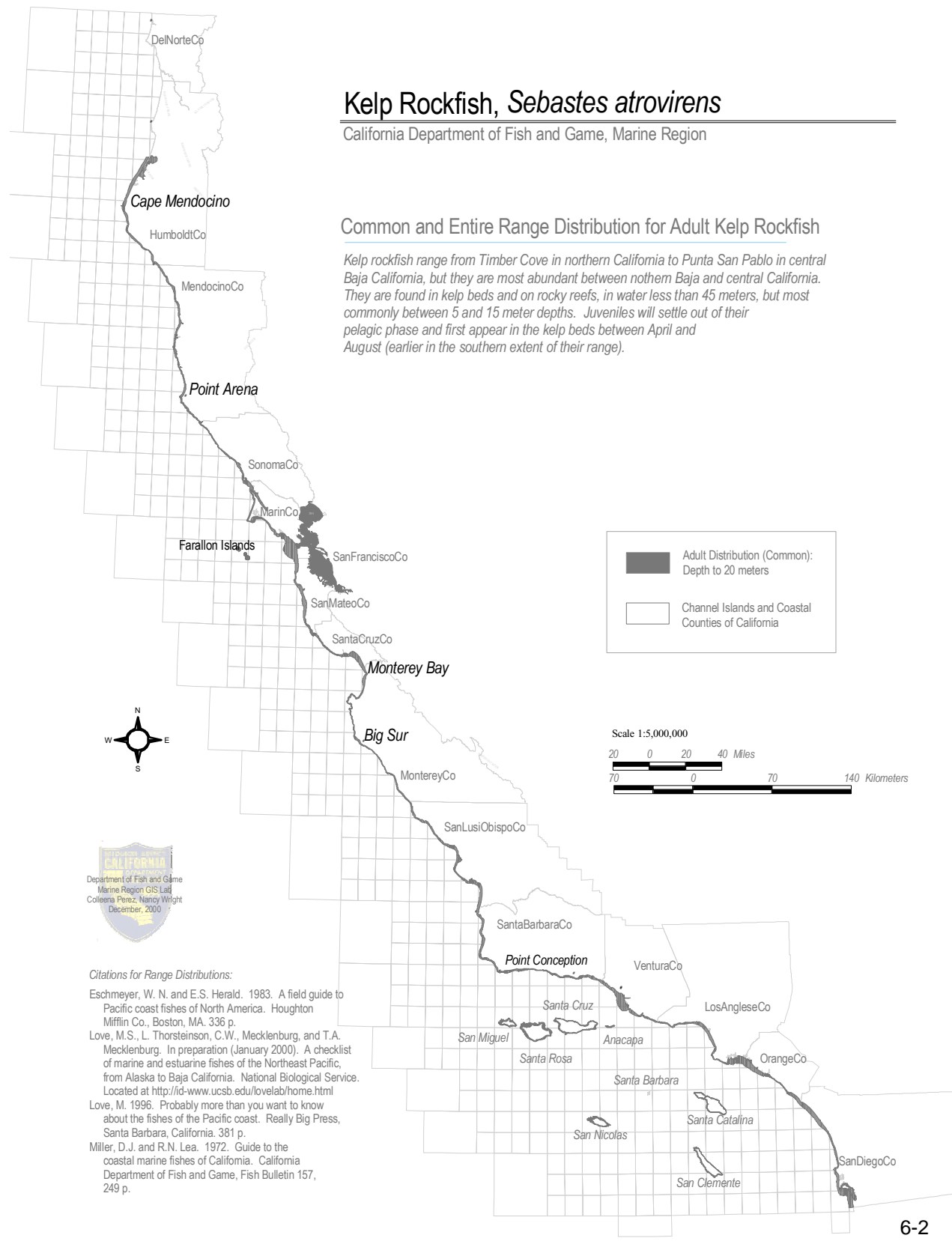


Kelp Rockfish, *Sebastes atrovirens*

California Department of Fish and Game, Marine Region

Common and Entire Range Distribution for Adult Kelp Rockfish

Kelp rockfish range from Timber Cove in northern California to Punta San Pablo in central Baja California, but they are most abundant between northern Baja and central California. They are found in kelp beds and on rocky reefs, in water less than 45 meters, but most commonly between 5 and 15 meter depths. Juveniles will settle out of their pelagic phase and first appear in the kelp beds between April and August (earlier in the southern extent of their range).

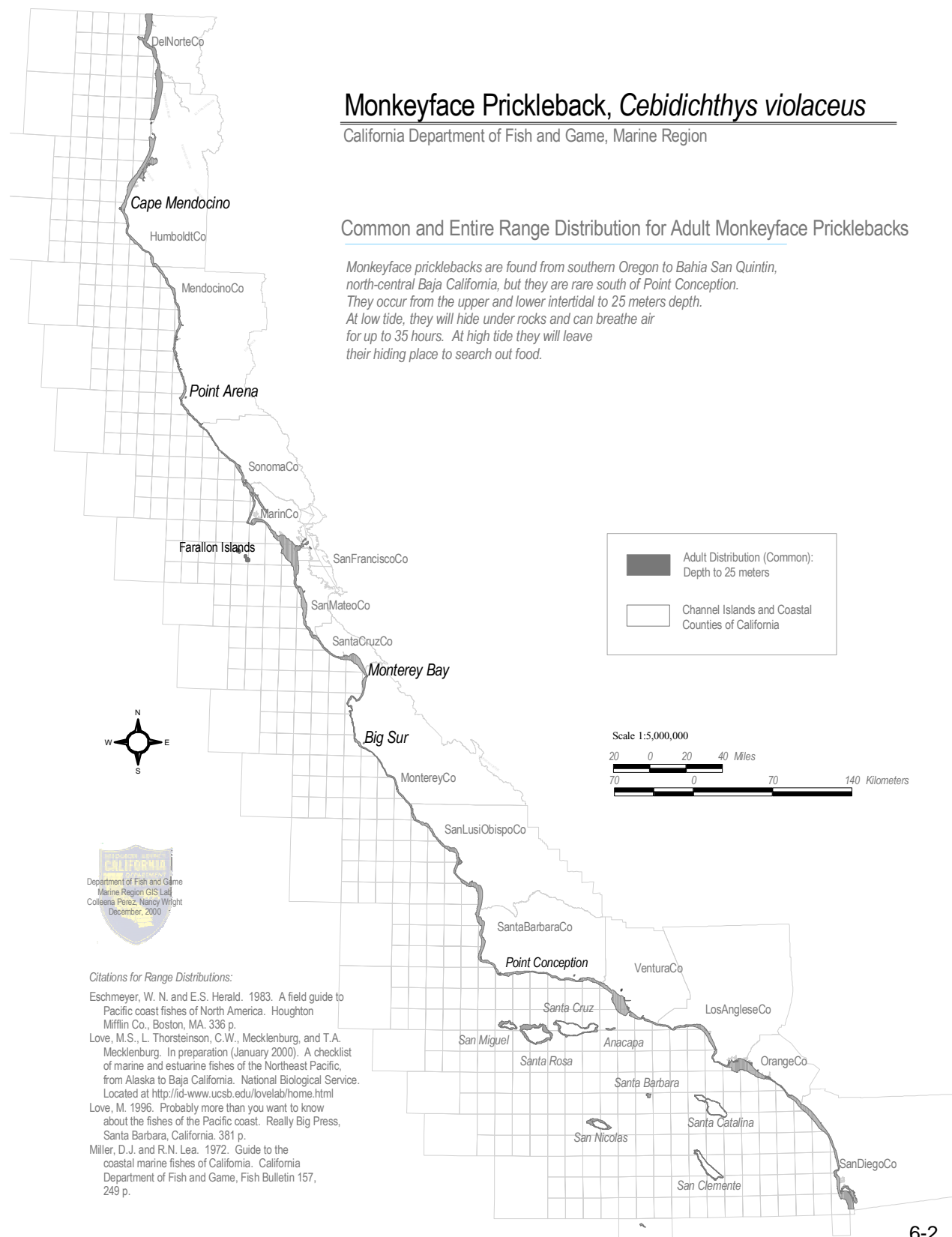


Monkeyface Prickleback, *Cebidichthys violaceus*

California Department of Fish and Game, Marine Region

Common and Entire Range Distribution for Adult Monkeyface Pricklebacks

Monkeyface pricklebacks are found from southern Oregon to Bahia San Quintin, north-central Baja California, but they are rare south of Point Conception. They occur from the upper and lower intertidal to 25 meters depth. At low tide, they will hide under rocks and can breathe air for up to 35 hours. At high tide they will leave their hiding place to search out food.

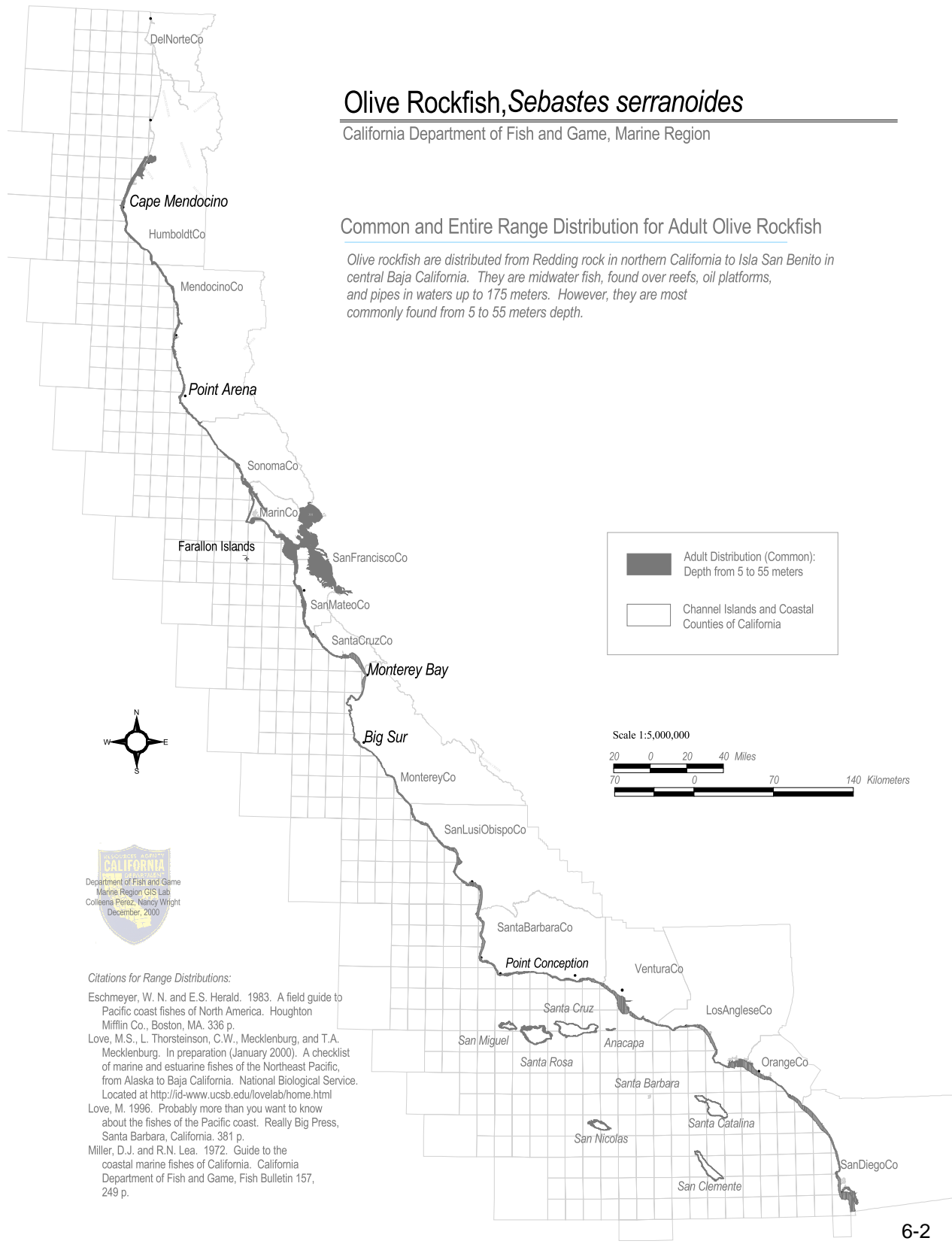


Olive Rockfish, *Sebastes serranoides*

California Department of Fish and Game, Marine Region

Common and Entire Range Distribution for Adult Olive Rockfish

Olive rockfish are distributed from Redding rock in northern California to Isla San Benito in central Baja California. They are midwater fish, found over reefs, oil platforms, and pipes in waters up to 175 meters. However, they are most commonly found from 5 to 55 meters depth.

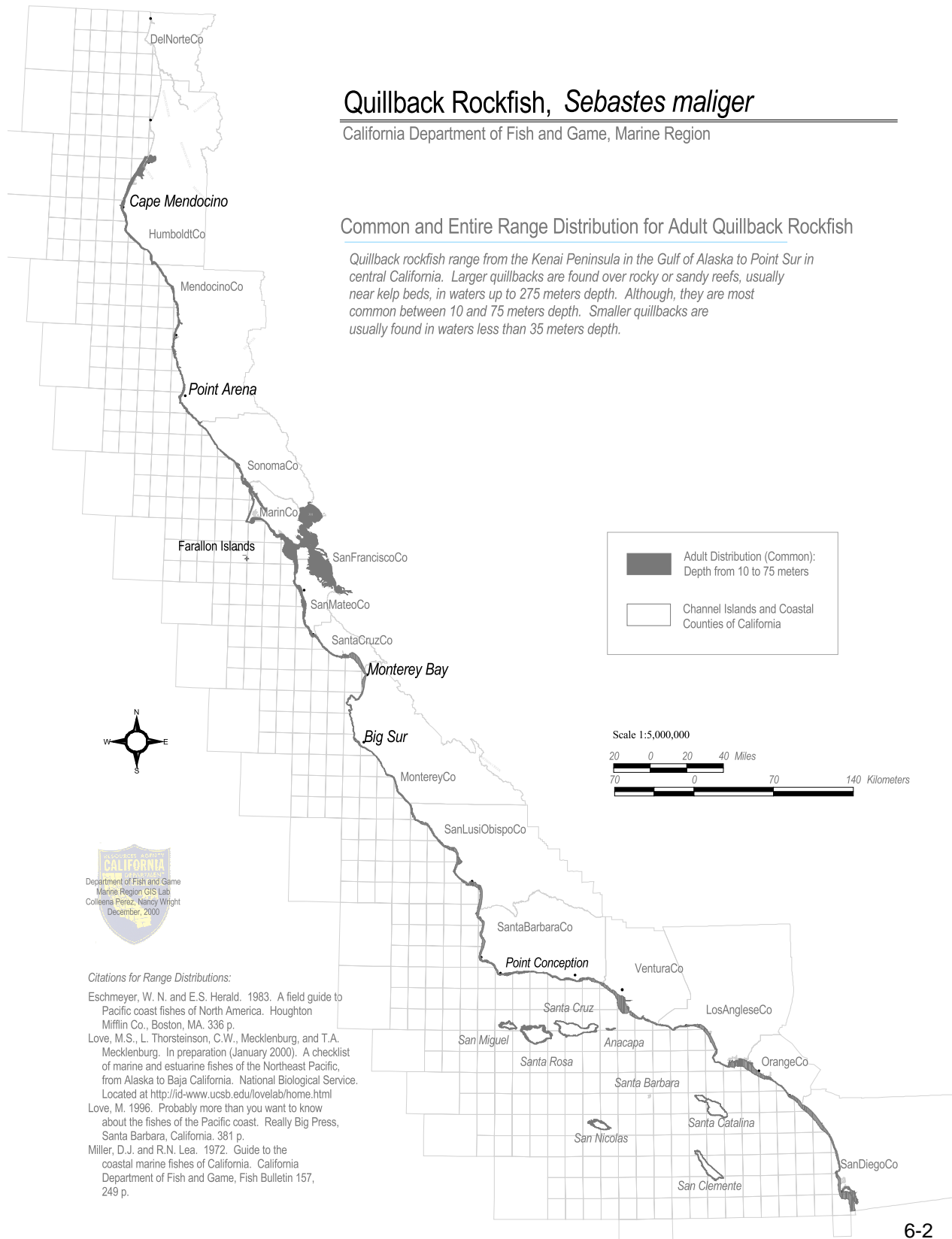


Quillback Rockfish, *Sebastes maliger*

California Department of Fish and Game, Marine Region

Common and Entire Range Distribution for Adult Quillback Rockfish

Quillback rockfish range from the Kenai Peninsula in the Gulf of Alaska to Point Sur in central California. Larger quillbacks are found over rocky or sandy reefs, usually near kelp beds, in waters up to 275 meters depth. Although, they are most common between 10 and 75 meters depth. Smaller quillbacks are usually found in waters less than 35 meters depth.

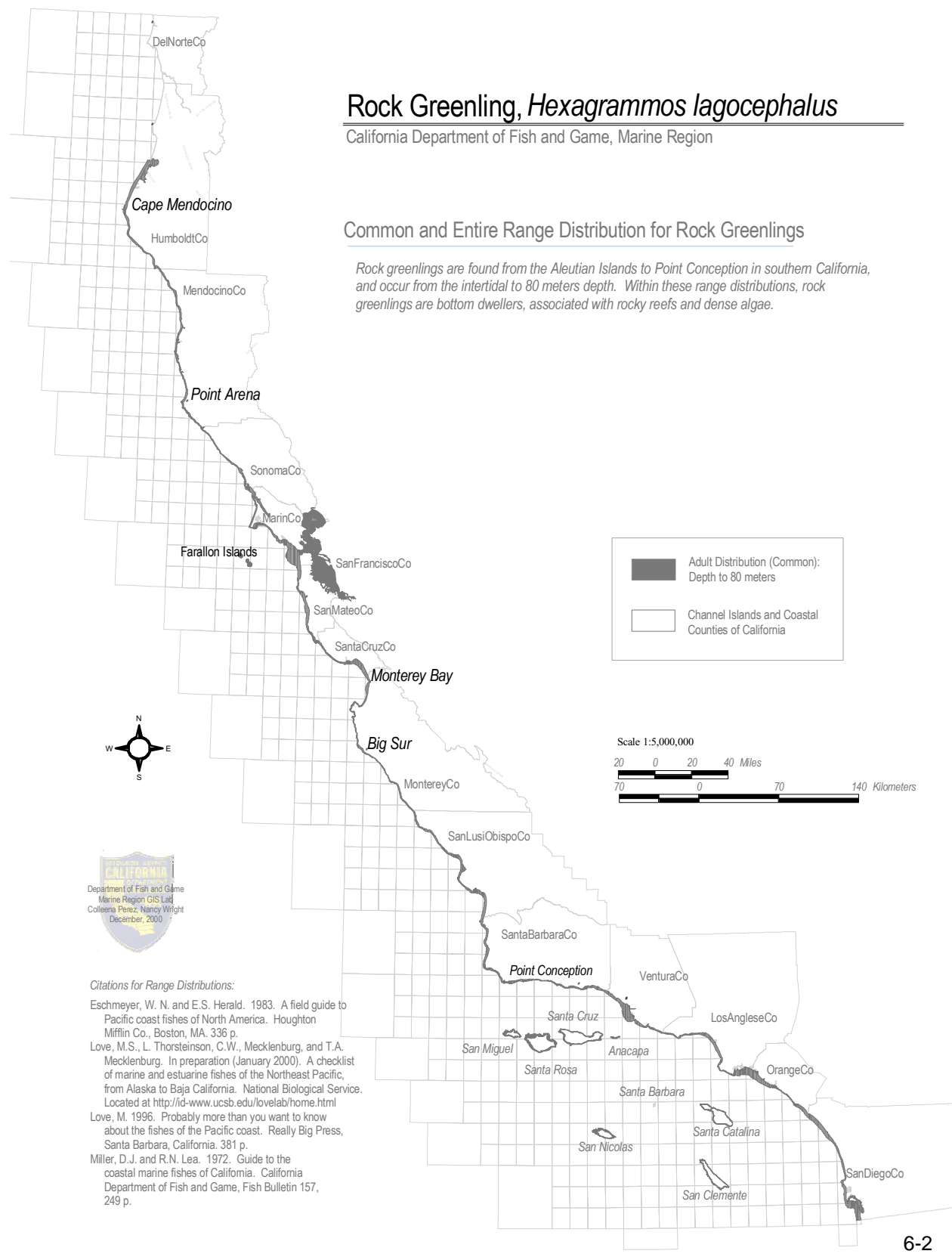


Rock Greenling, *Hexagrammos lagocephalus*

California Department of Fish and Game, Marine Region

Common and Entire Range Distribution for Rock Greenlings

Rock greenlings are found from the Aleutian Islands to Point Conception in southern California, and occur from the intertidal to 80 meters depth. Within these range distributions, rock greenlings are bottom dwellers, associated with rocky reefs and dense algae.

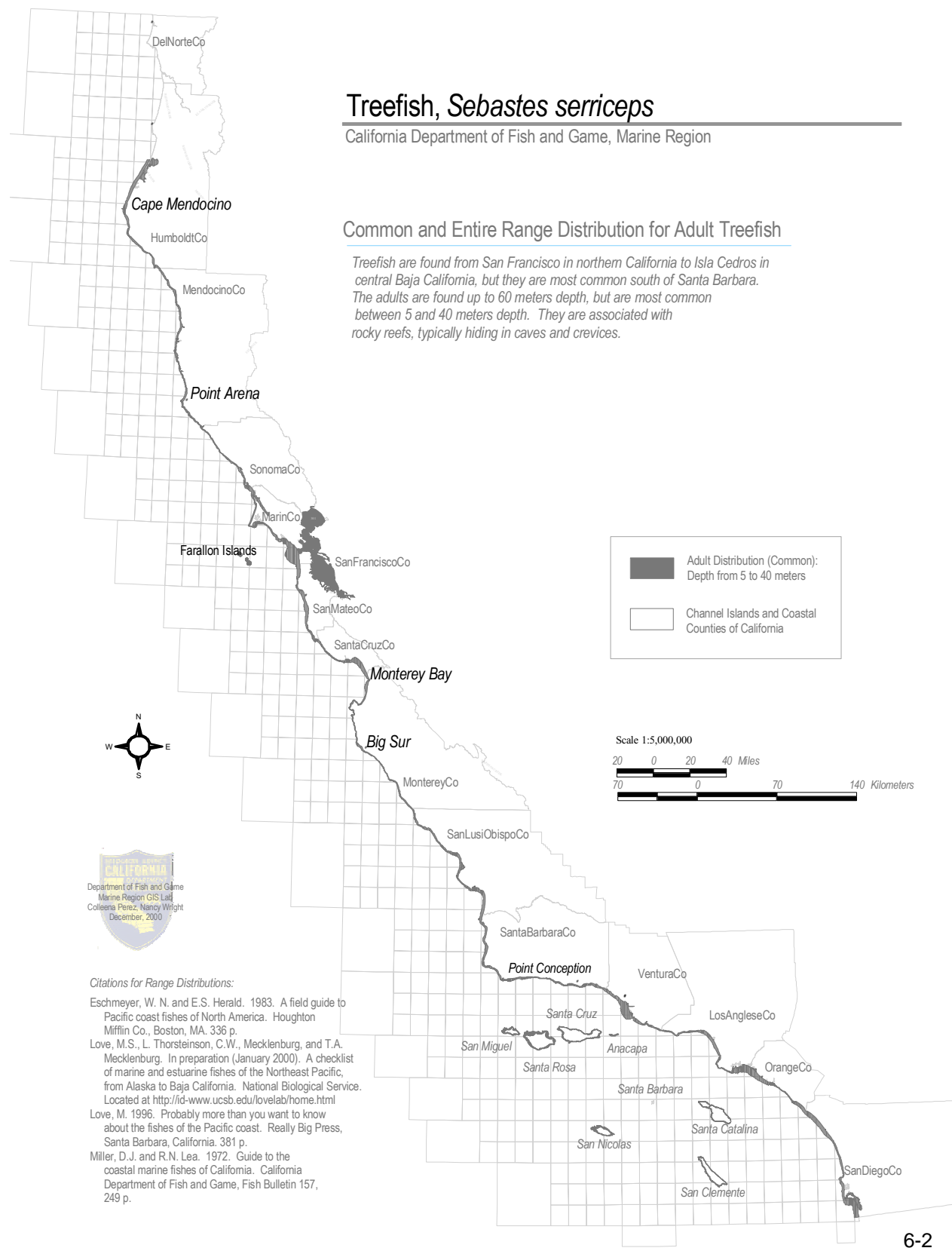


Treefish, *Sebastes serriceps*

California Department of Fish and Game, Marine Region

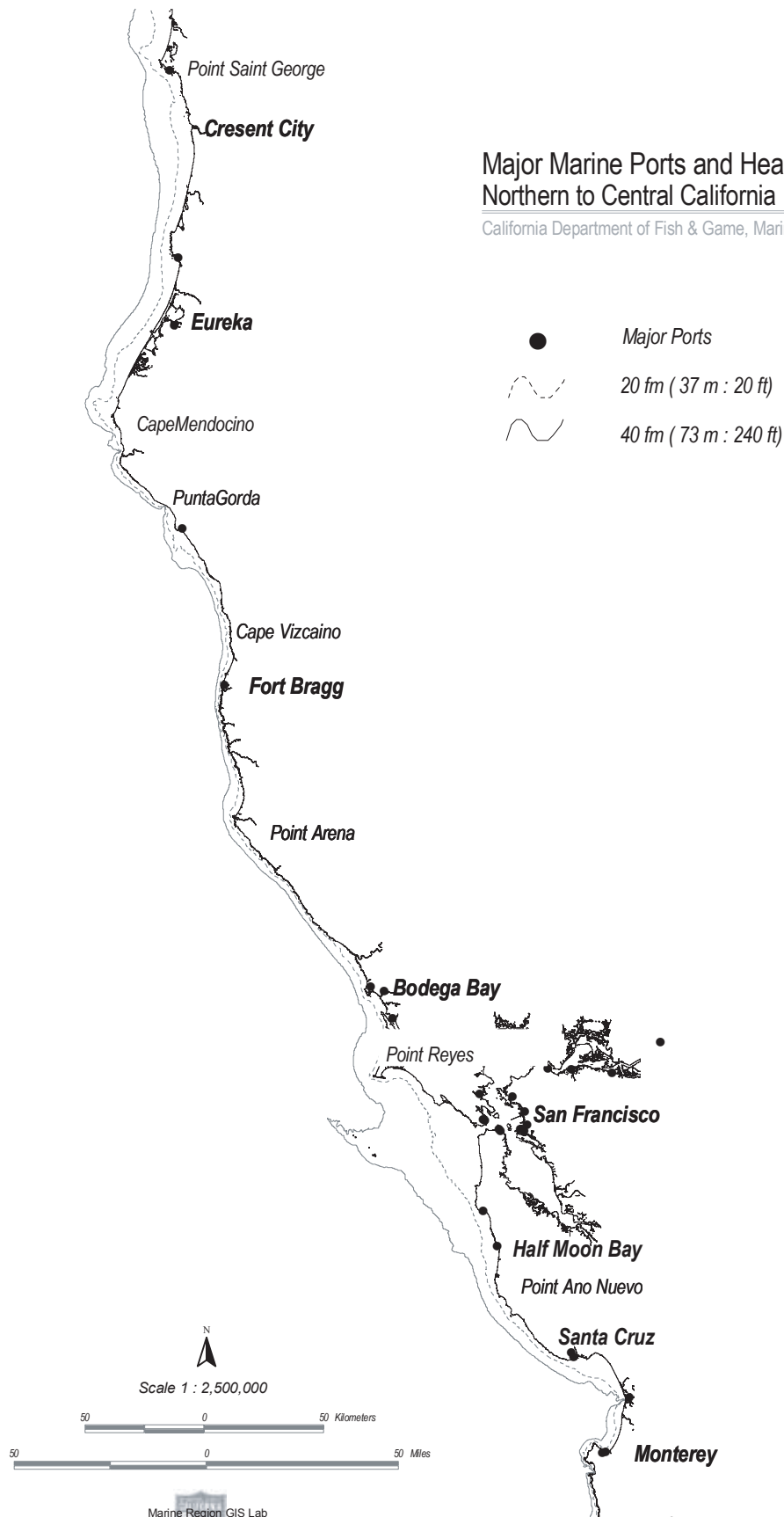
Common and Entire Range Distribution for Adult Treefish

Treefish are found from San Francisco in northern California to Isla Cedros in central Baja California, but they are most common south of Santa Barbara. The adults are found up to 60 meters depth, but are most common between 5 and 40 meters depth. They are associated with rocky reefs, typically hiding in caves and crevices.



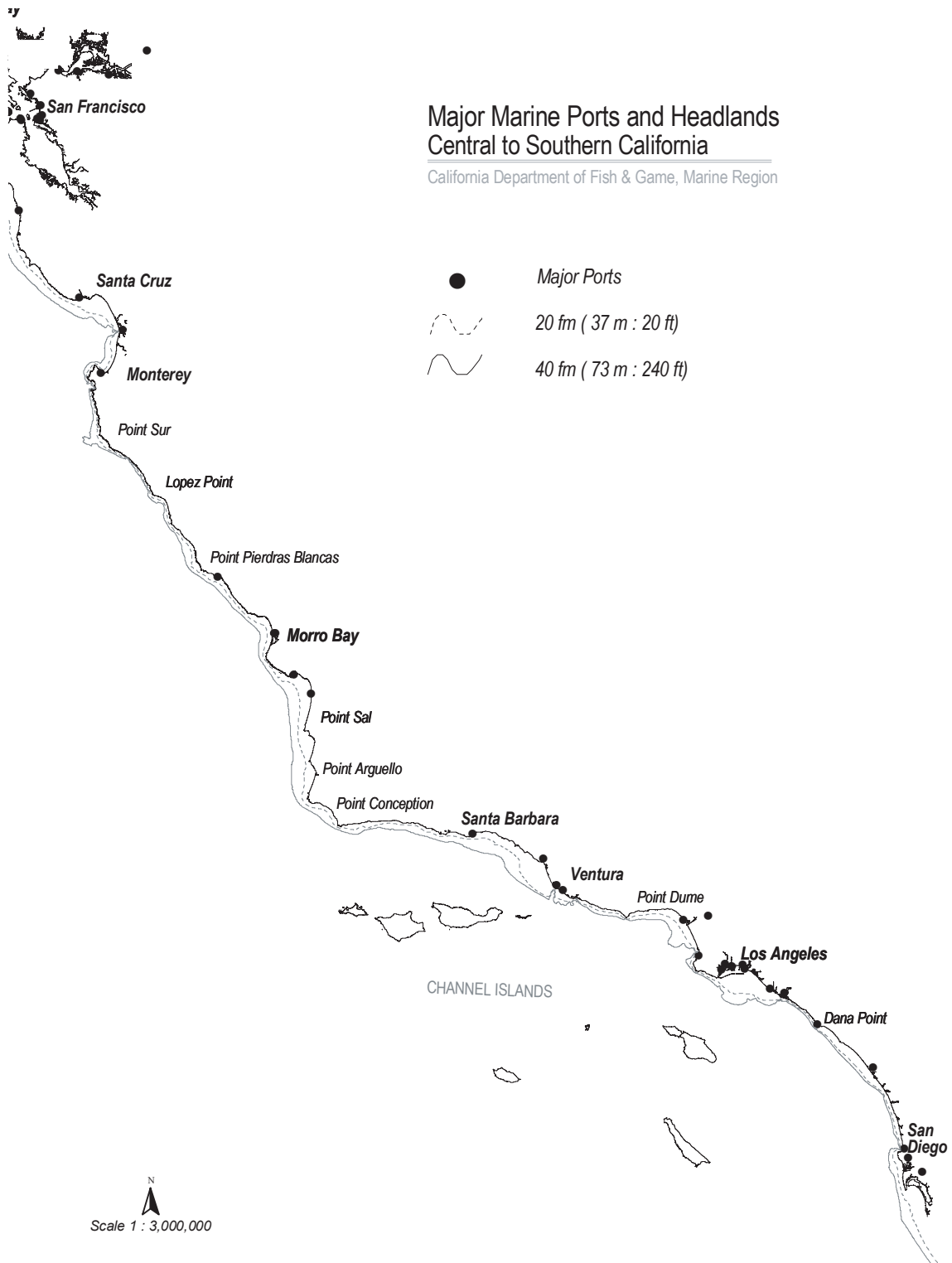
Major Marine Ports and Headlands Northern to Central California

California Department of Fish & Game, Marine Region



Marine Region GIS Lab
Mi Park, Nancy Wright
May 2001

2001-CEQA-FMP



SantaBarbaraCo

Point Conception

VenturaCo

LosAngelesCo

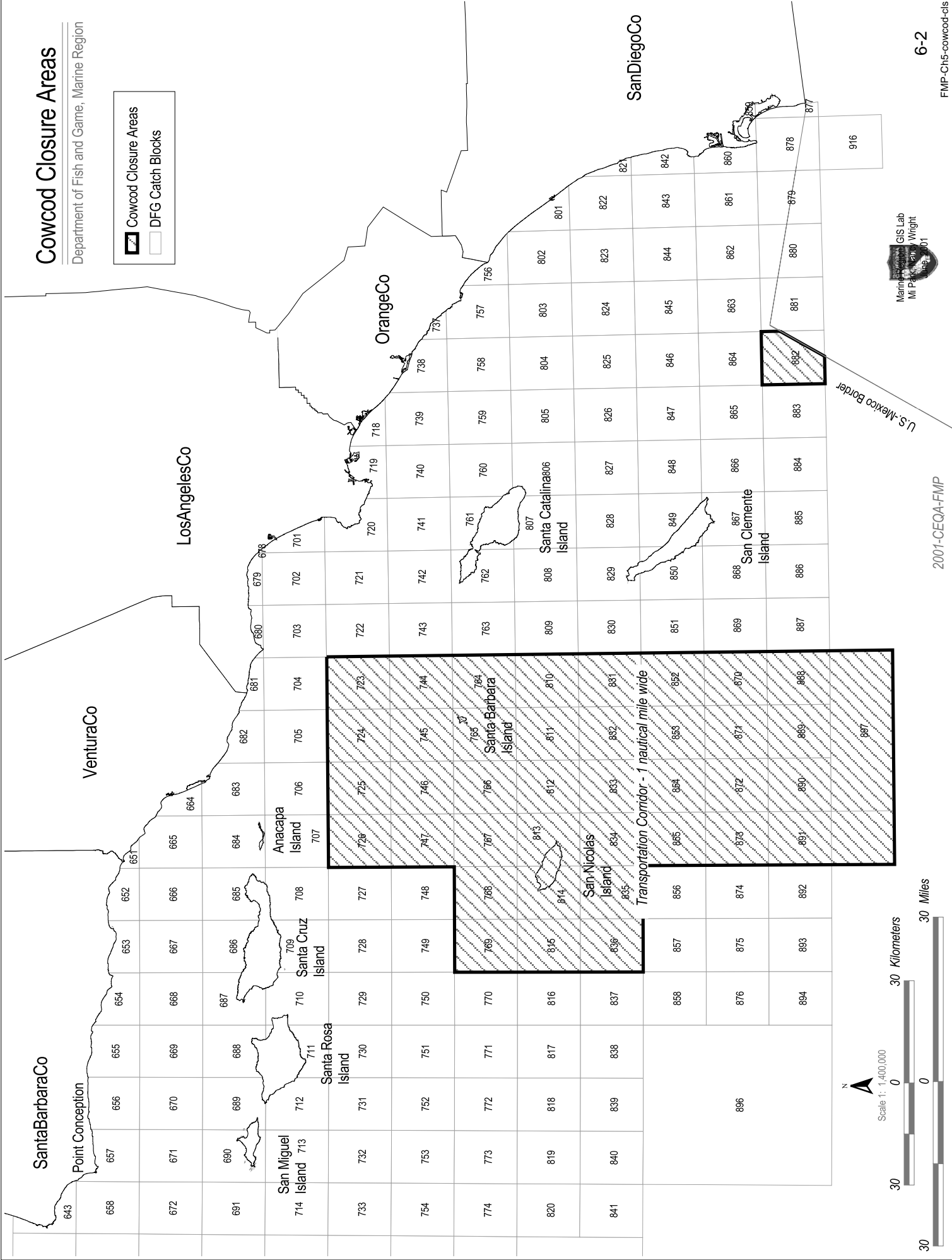
OrangeCo

SanDiegoCo

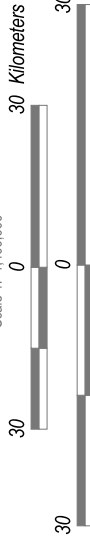
Cowcod Closure Areas

Department of Fish and Game, Marine Region

-  Cowcod Closure Areas
-  DFG Catch Blocks



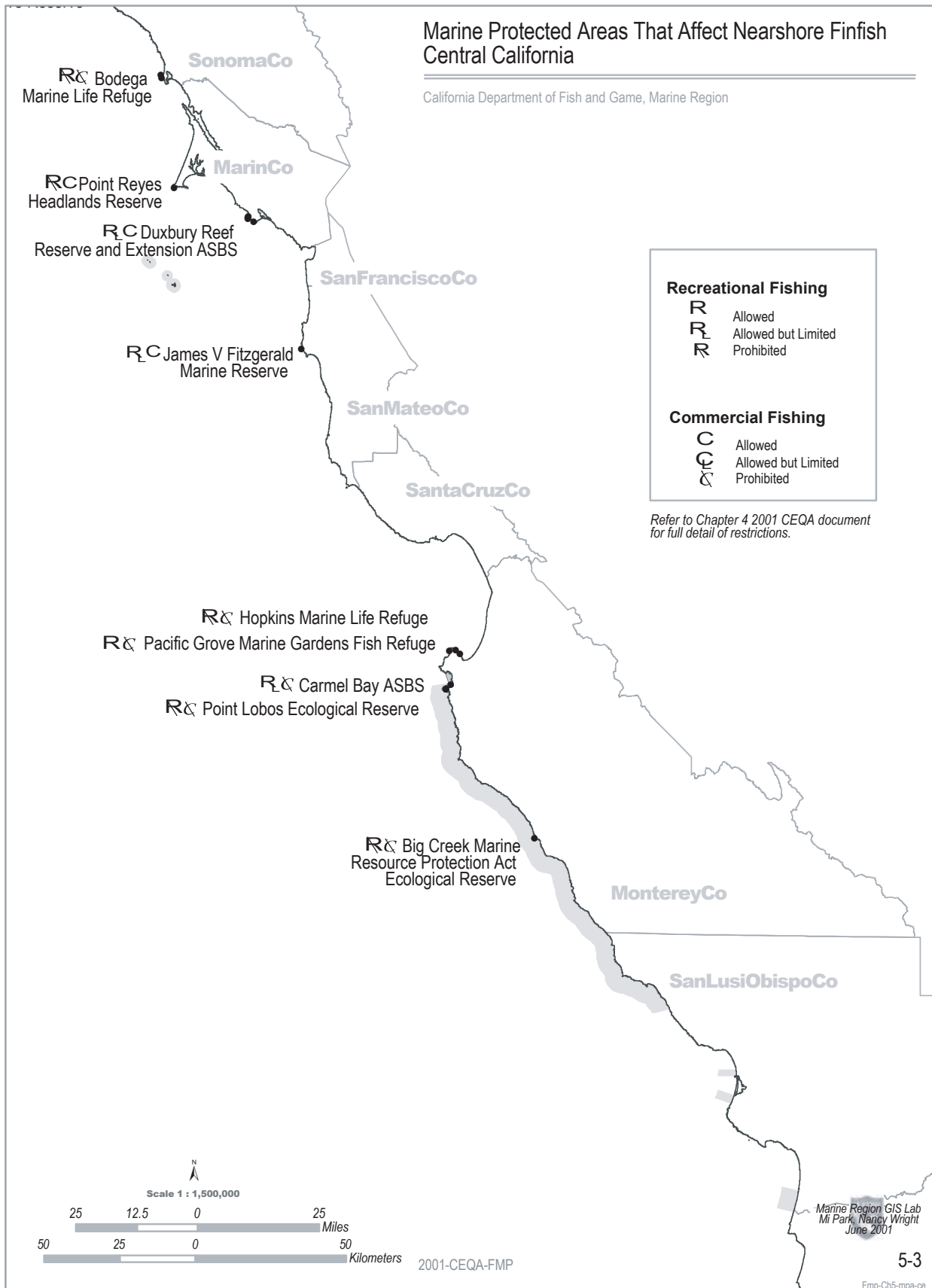
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Marine Protected Areas That Affect Nearshore Finfish Central California

California Department of Fish and Game, Marine Region



Marine Protected Areas That Affect Nearshore Finfish Northern California

California Department of Fish and Game, Marine Region

Del Norte Co

Humboldt Co


Mendocino Co

Sonoma Co

Recreational Fishing

-  Allowed
-  Allowed but Limited
-  Prohibited

Commercial Fishing

-  Allowed
-  Allowed but Limited
-  Prohibited

Refer to Chapter 4 2001 CEQA document for full detail of restrictions.

 King Range
MRPA Ecological Reserve

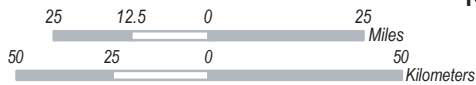
 Point Cabrillo Reserve

 Del Mar Landing
Ecological Reserve ASBS

 Grestle Cove Reserve



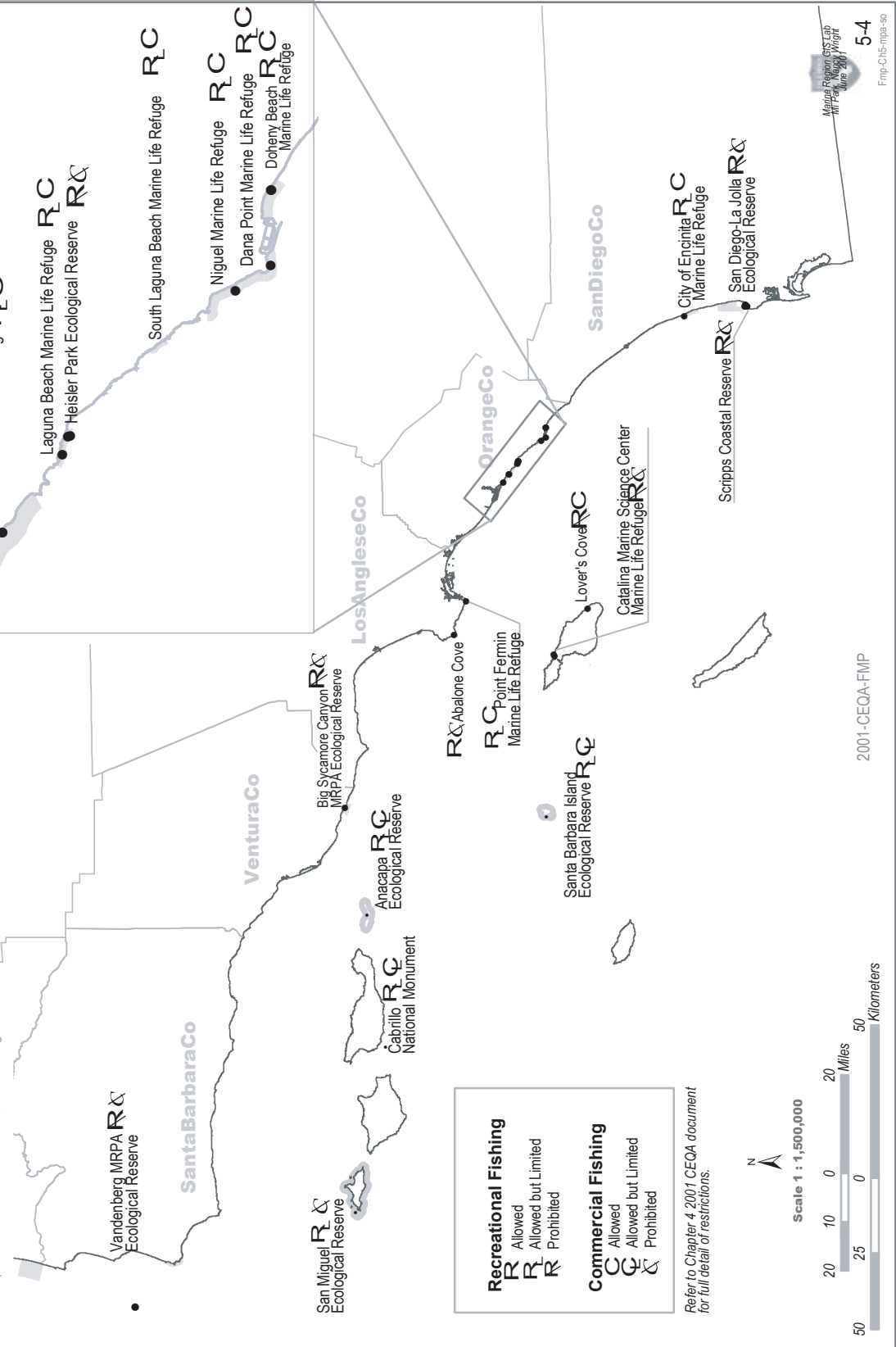
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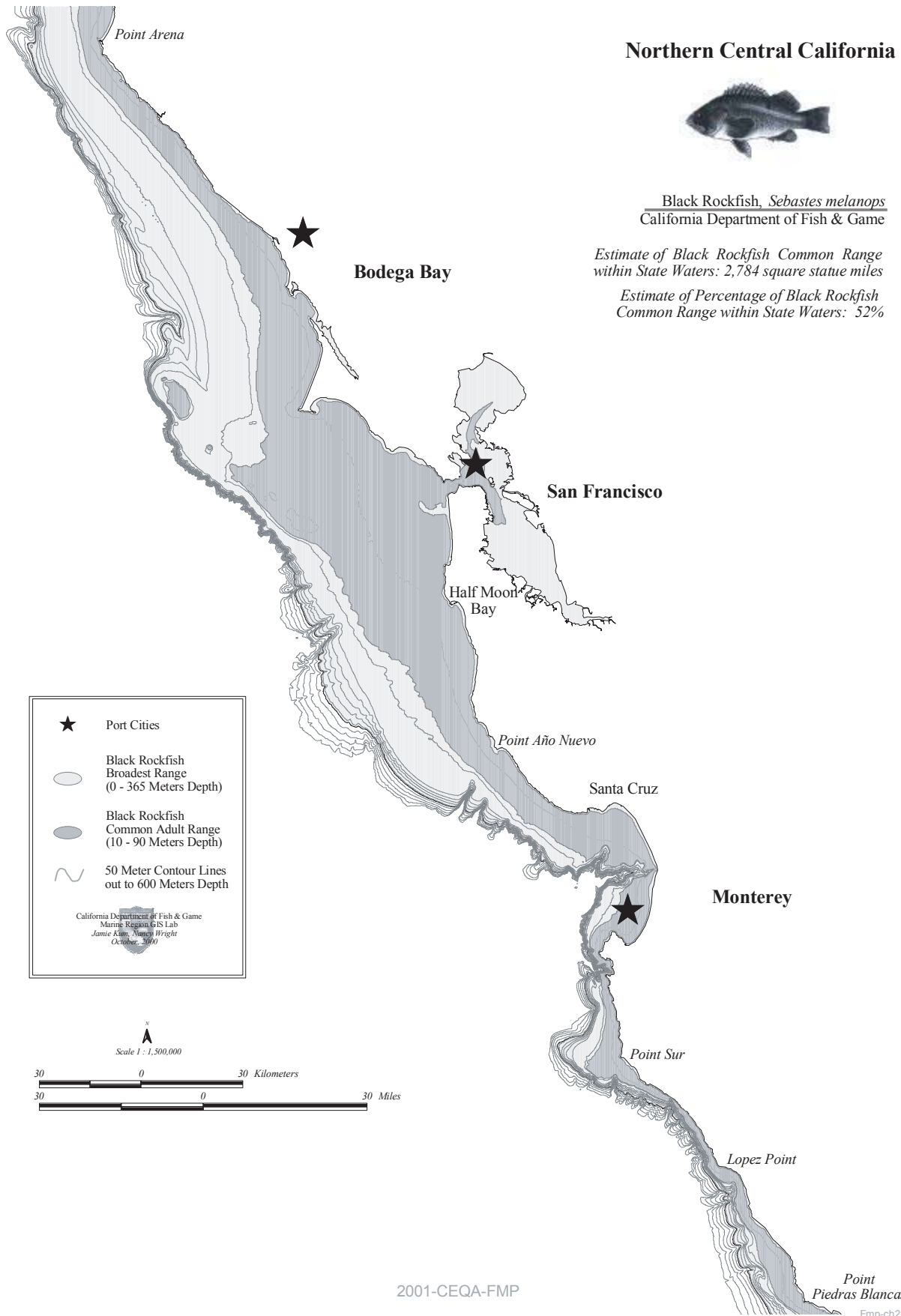


Marine Region GIS Lab
M. Park, V. Wright
June 2001

Marine Protected Areas That Affect Nearshore Finfish Southern California

California Department of Fish and Game, Marine Region





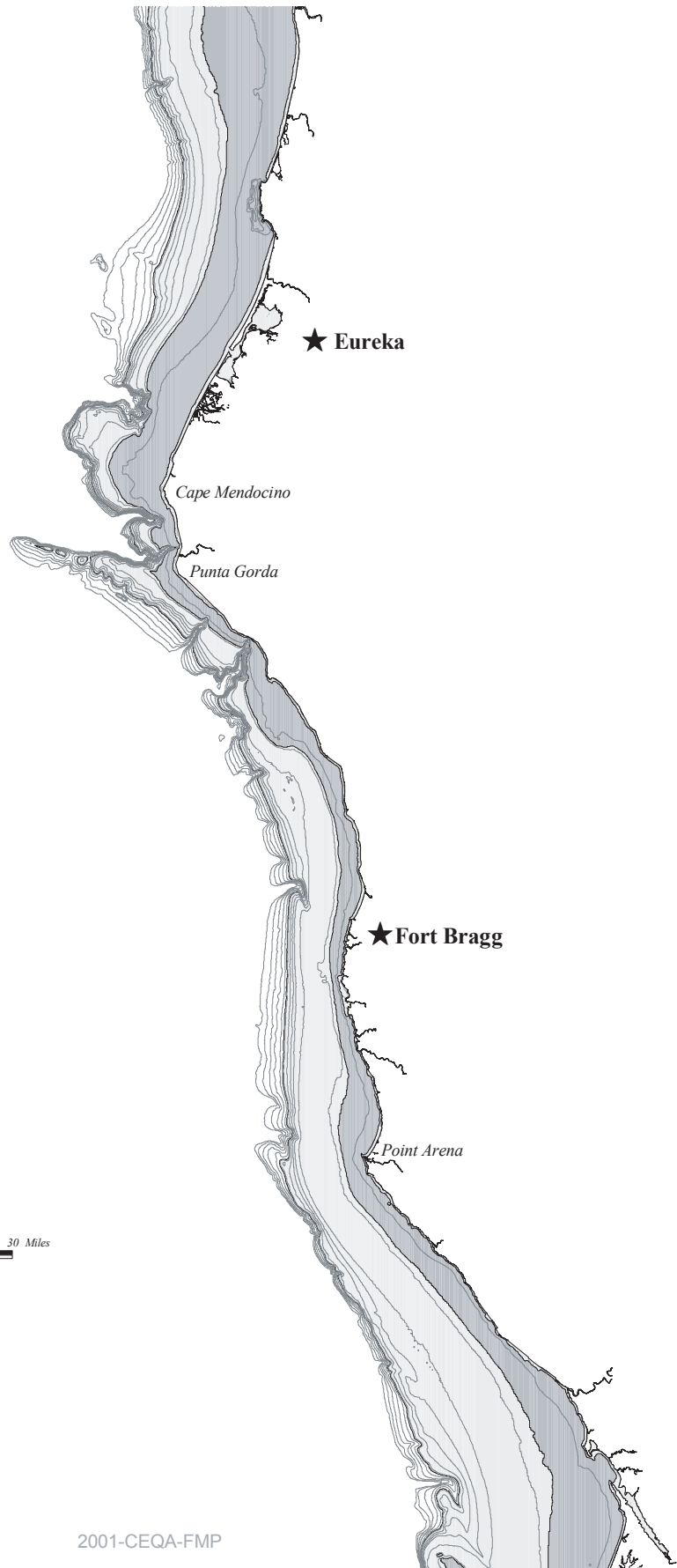
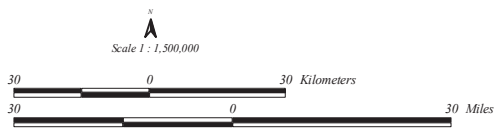
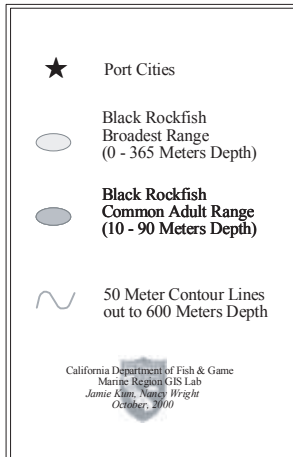
Northern California

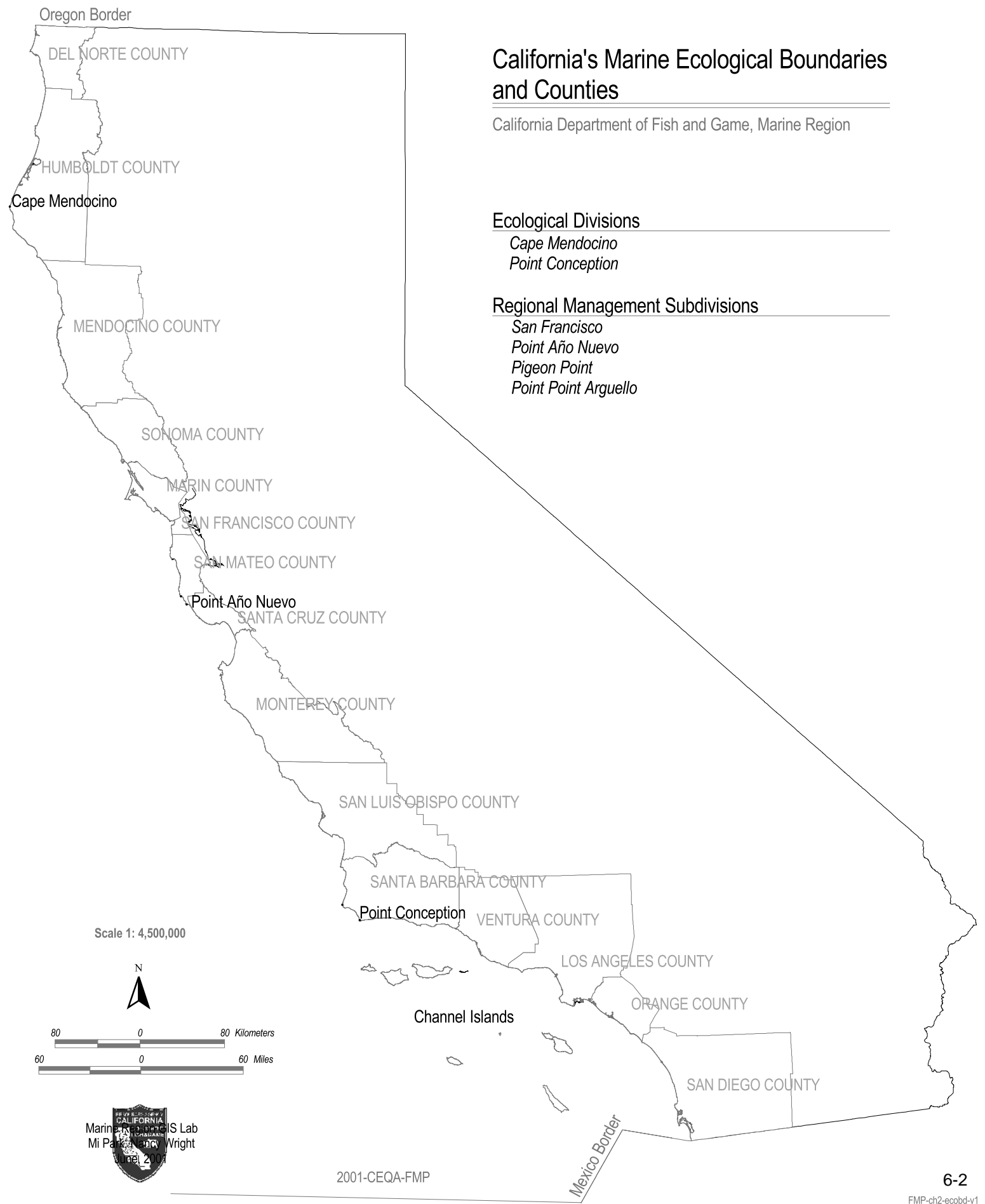


Black Rockfish, *Sebastes melanops*
California Department of Fish & Game

*Estimate of Black Rockfish Common Range
within State Waters: 2,784 square statute miles*

*Estimate of Percentage of Black Rockfish
Common Range within State Waters: 52%*





California's Marine Ecological Boundaries and Counties

California Department of Fish and Game, Marine Region

Ecological Divisions

- Cape Mendocino
- Point Conception

Regional Management Subdivisions

- San Francisco
- Point Año Nuevo
- Pigeon Point
- Point Point Arguello

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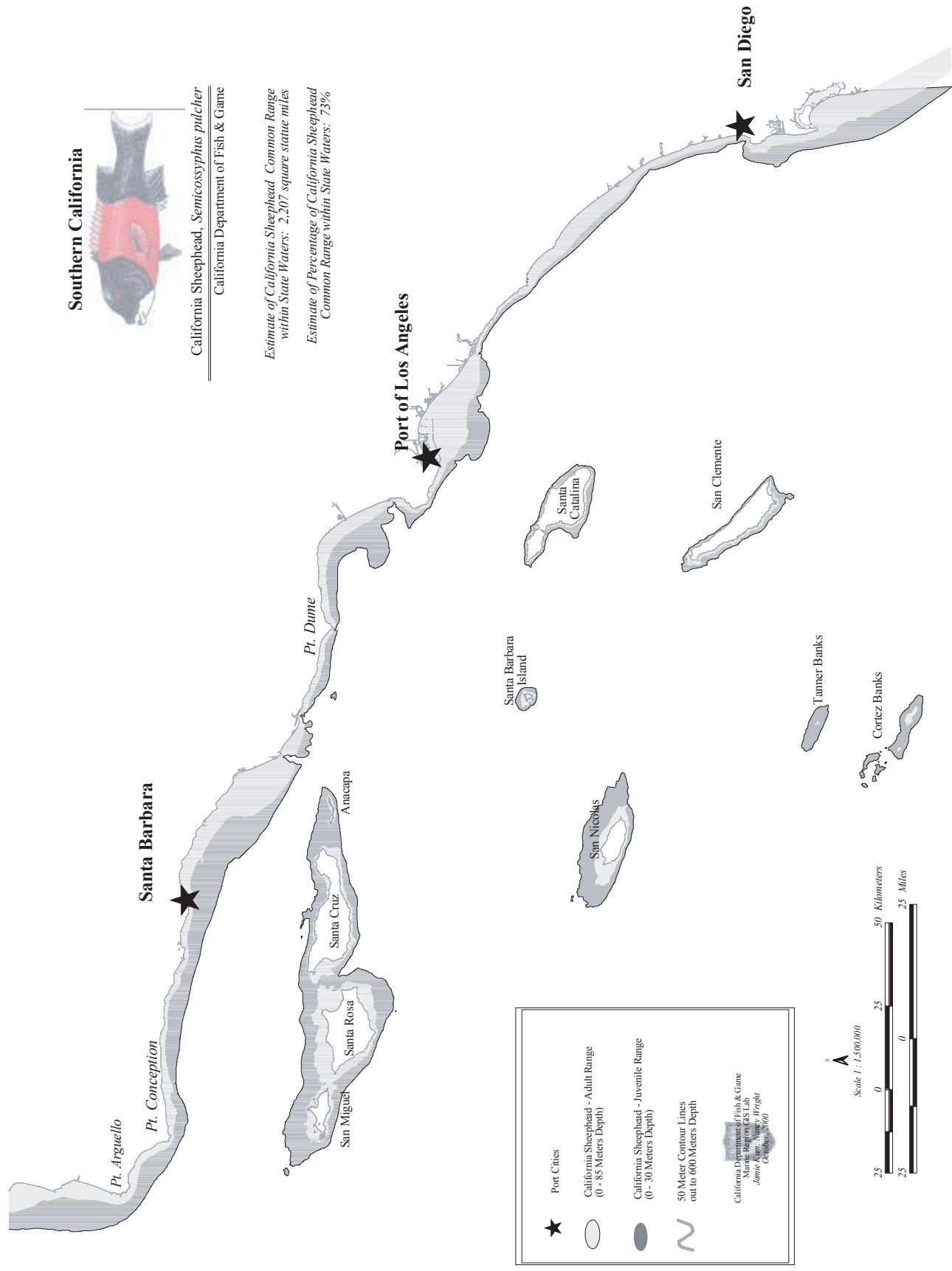
Mexico Border

Southern California



California Sheephead, *Semicossyphus pulcher*
California Department of Fish & Game

Estimate of California Sheephead Common Range
within State Waters: 2,207 square statute miles
Estimate of Percentage of California Sheephead
Common Range within State Waters: 75%



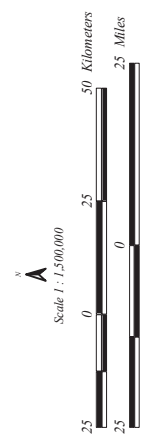
Port Cities

California Sheephead - Adult Range
(0 - 85 Meters Depth)

California Sheephead - Juvenile Range
(0 - 30 Meters Depth)

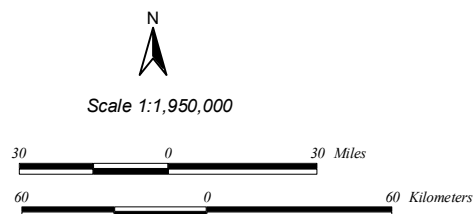
50 Meter Contour Lines
out to 600 Meters Depth

California Department of Fish & Game
Marine Biogeography GIS Lab
Janice Kuan, Nancy Wright
October, 2000



California Department of Fish & Game

Marine Region GIS Lab
Gina Wade, Nancy Wright
April 27, 2001

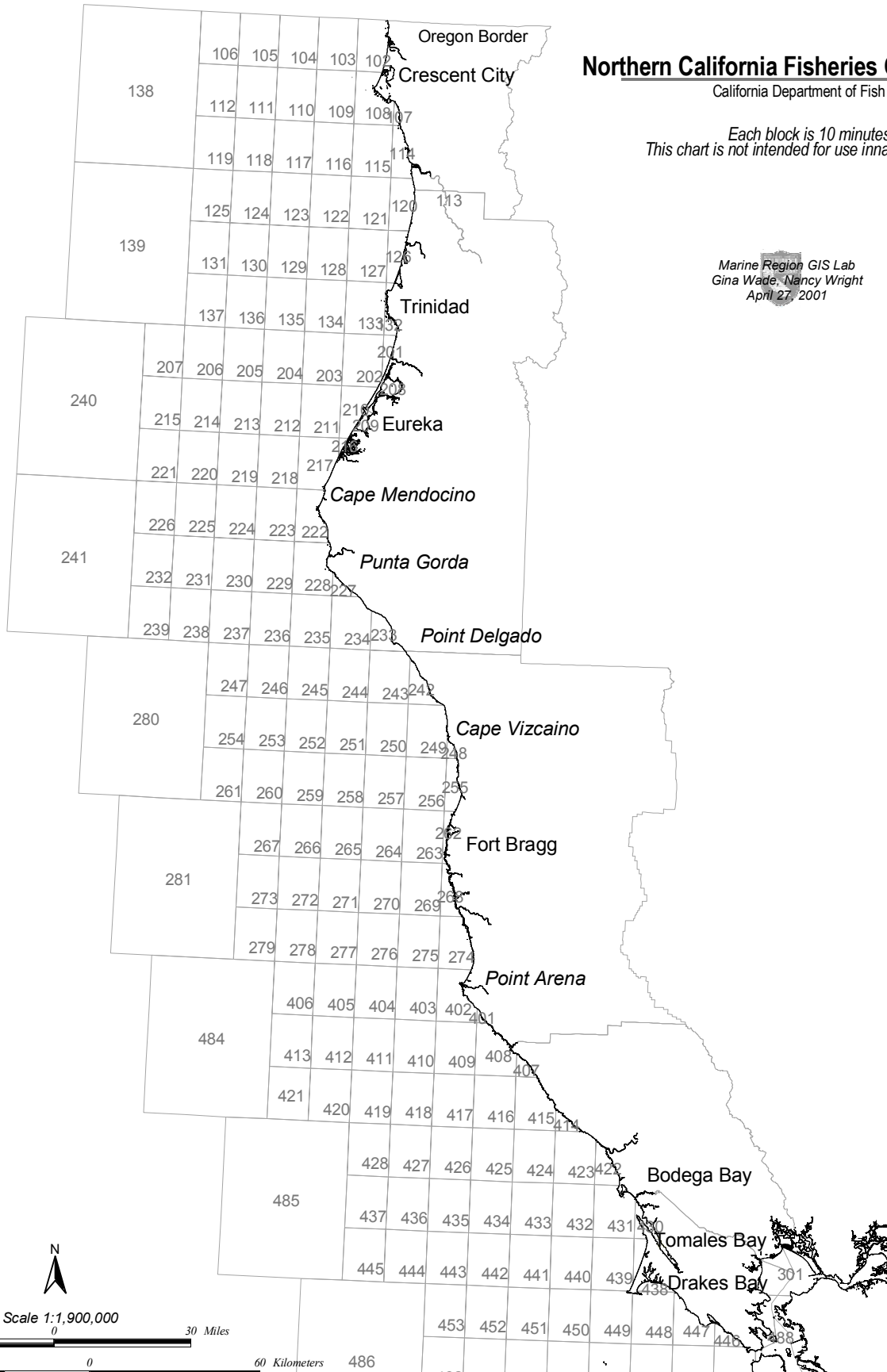


Northern California Fisheries Chart

California Department of Fish & Game

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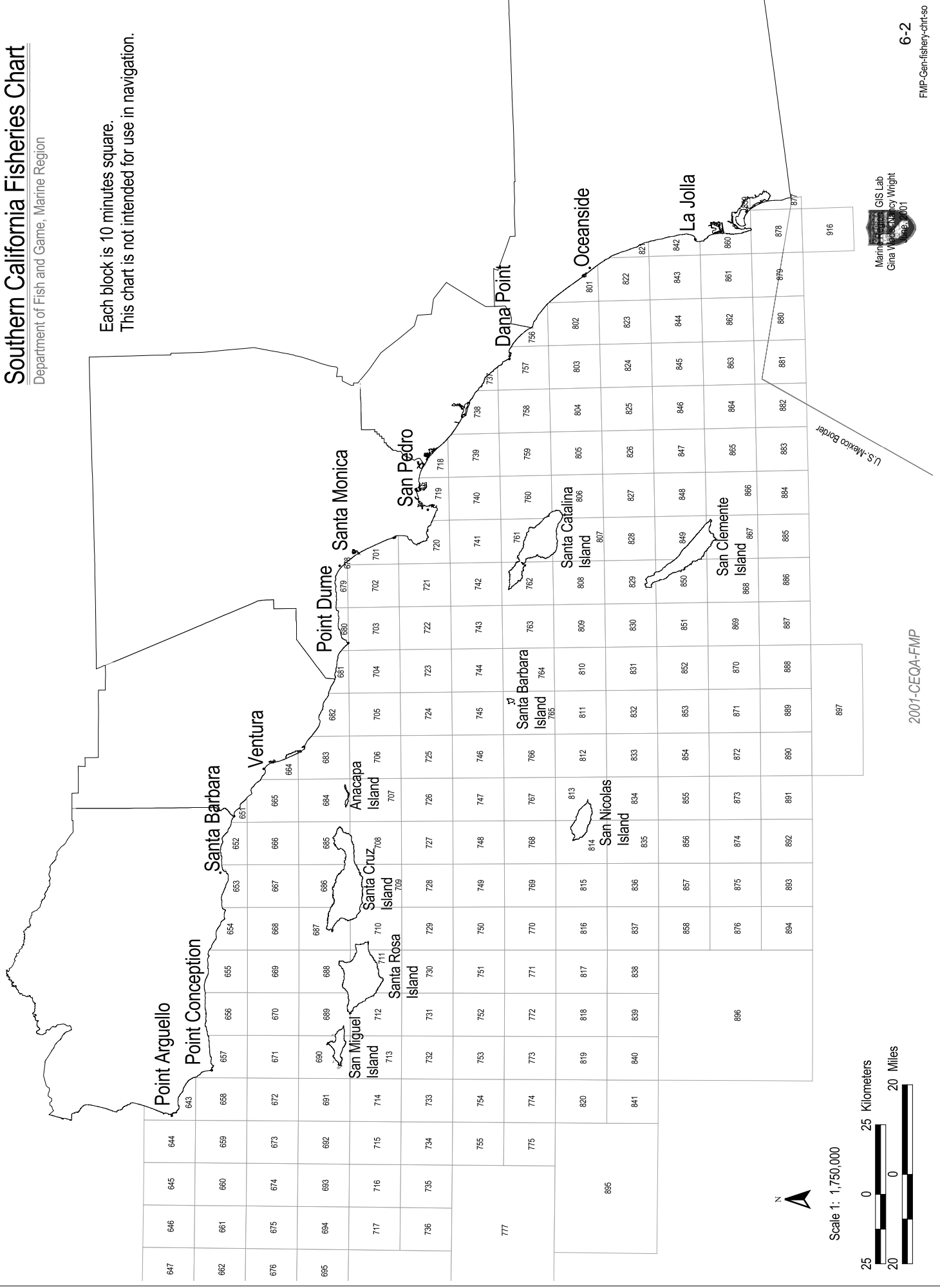
Marine Region GIS Lab
Gina Wade, Nancy Wright
April 27, 2001



Southern California Fisheries Chart

Department of Fish and Game, Marine Region

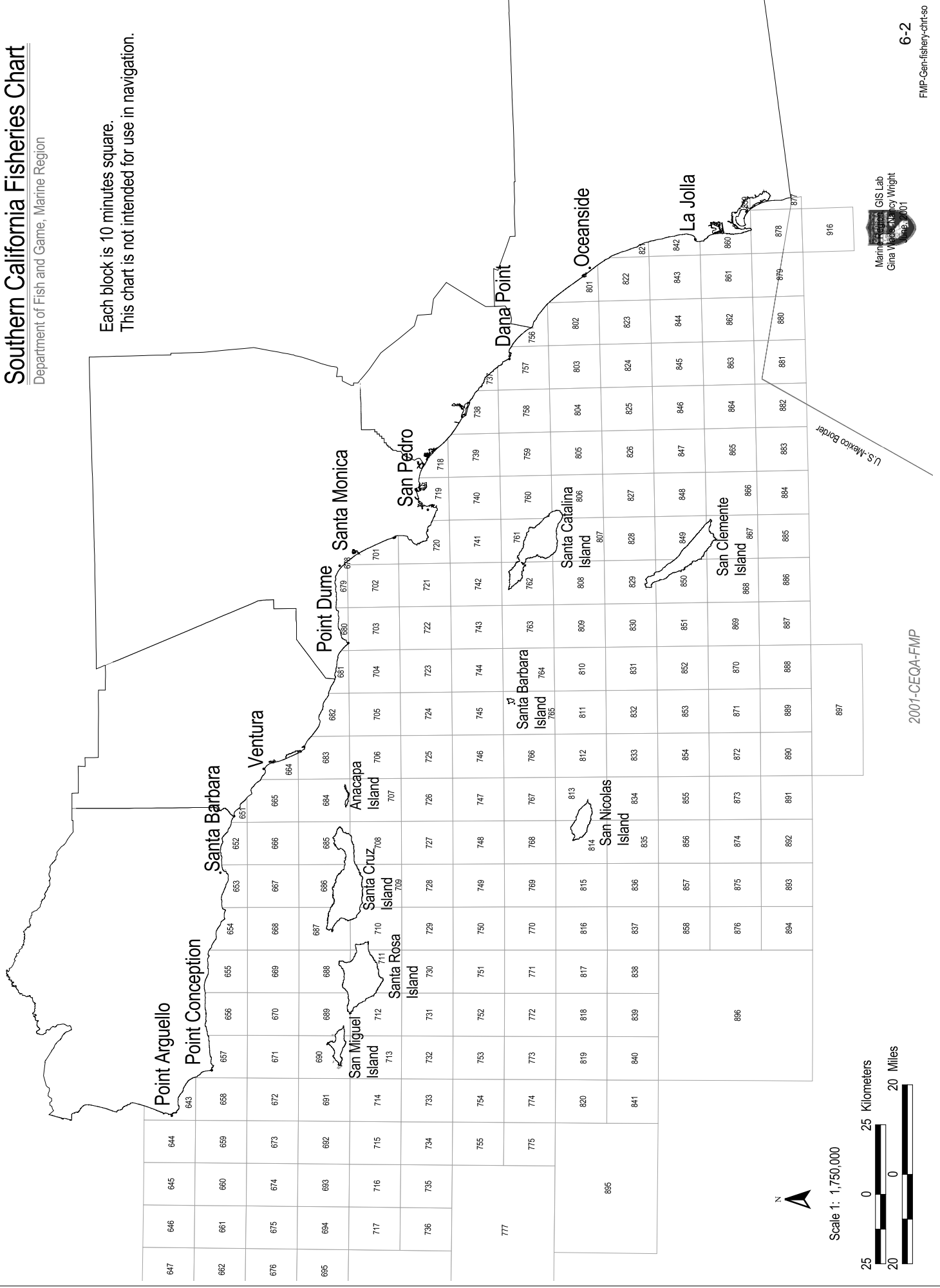
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Southern California Fisheries Chart

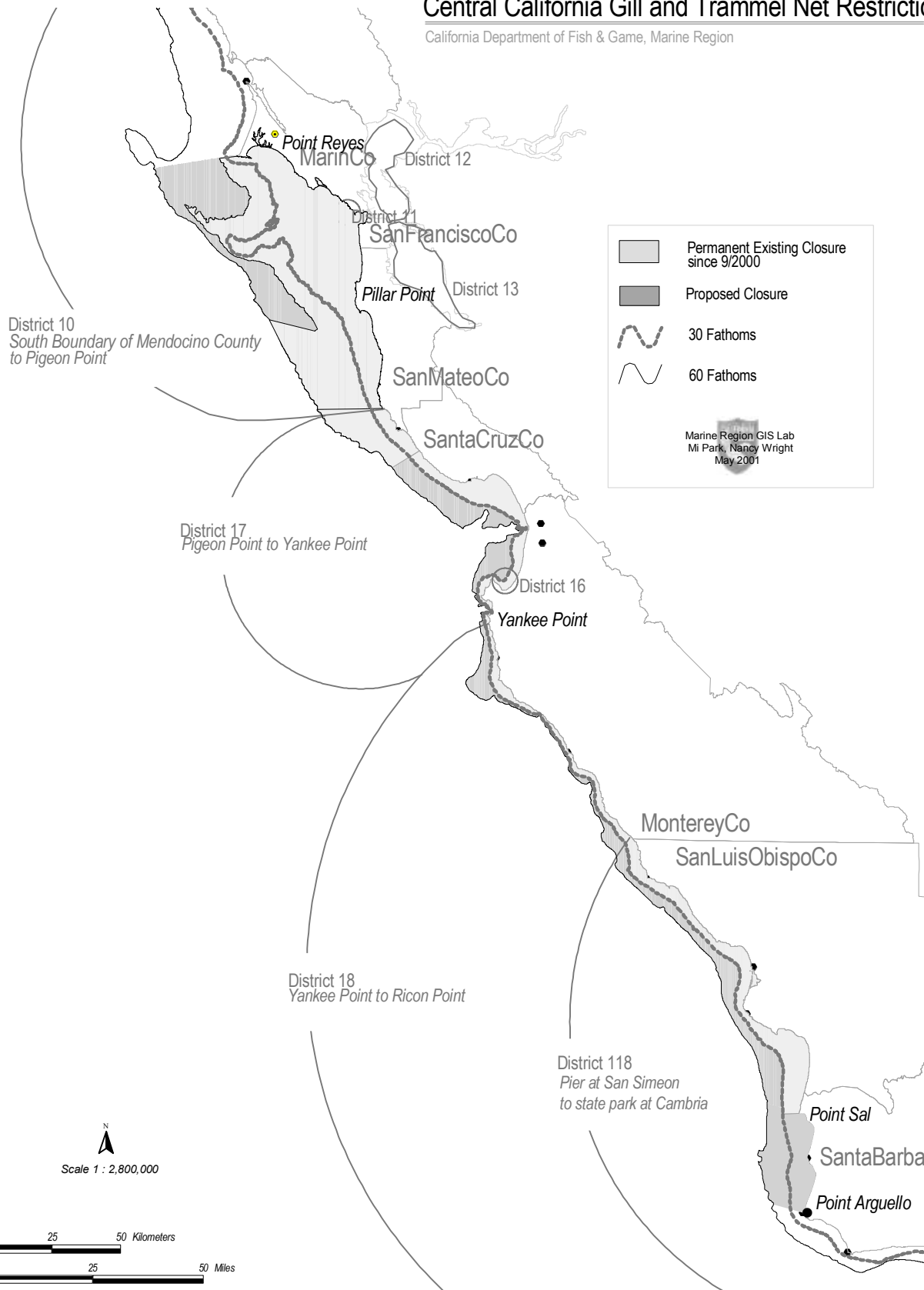
Department of Fish and Game, Marine Region

Each block is 10 minutes square.
This chart is not intended for use in navigation.



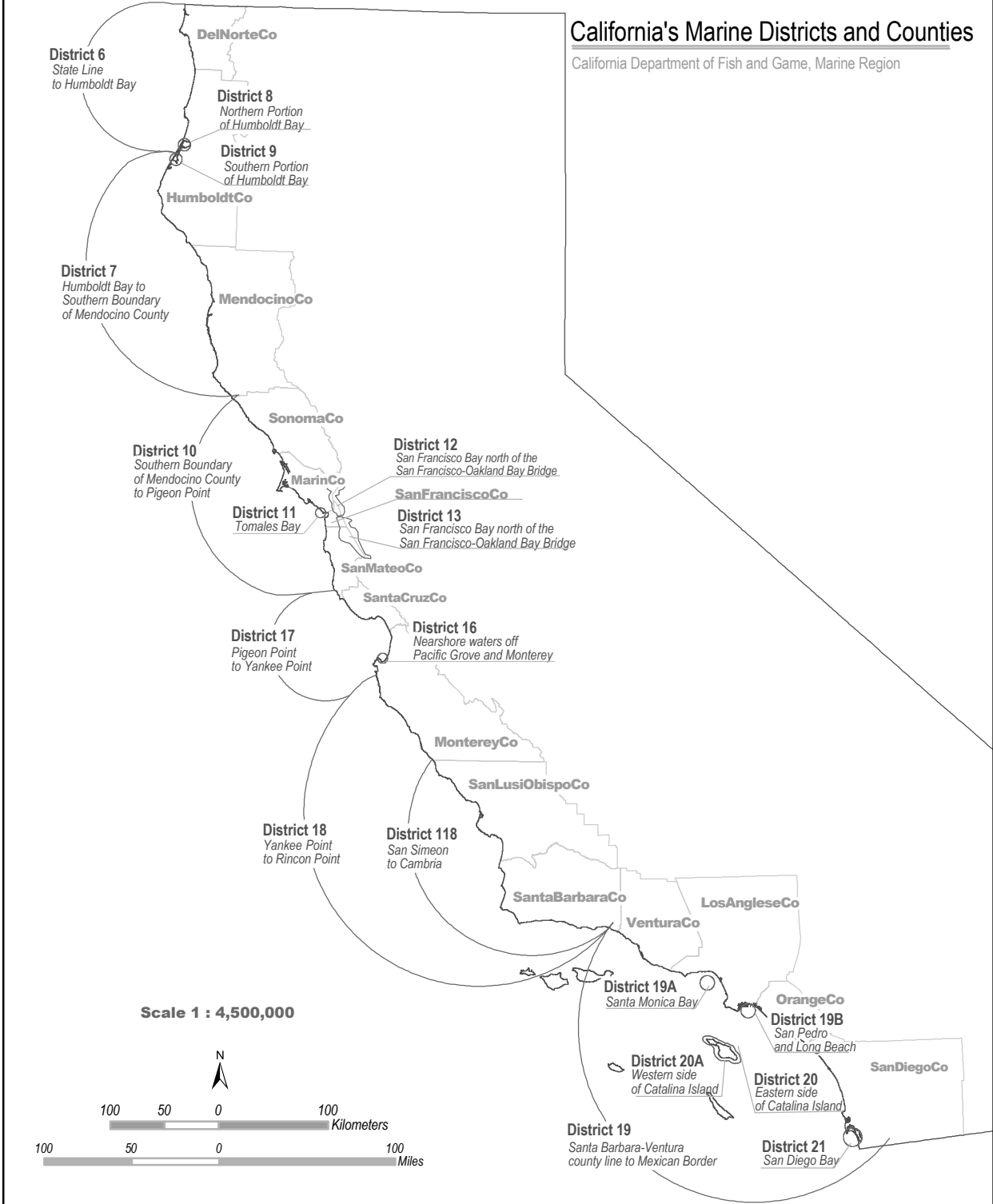
Central California Gill and Trammel Net Restrictions

California Department of Fish & Game, Marine Region

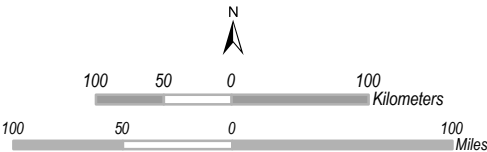


California's Marine Districts and Counties

California Department of Fish and Game, Marine Region



Scale 1 : 4,500,000



Marine Region GIS Lab
Mi Park, Nancy Wright
June 2001




2001-CEQA-FMP

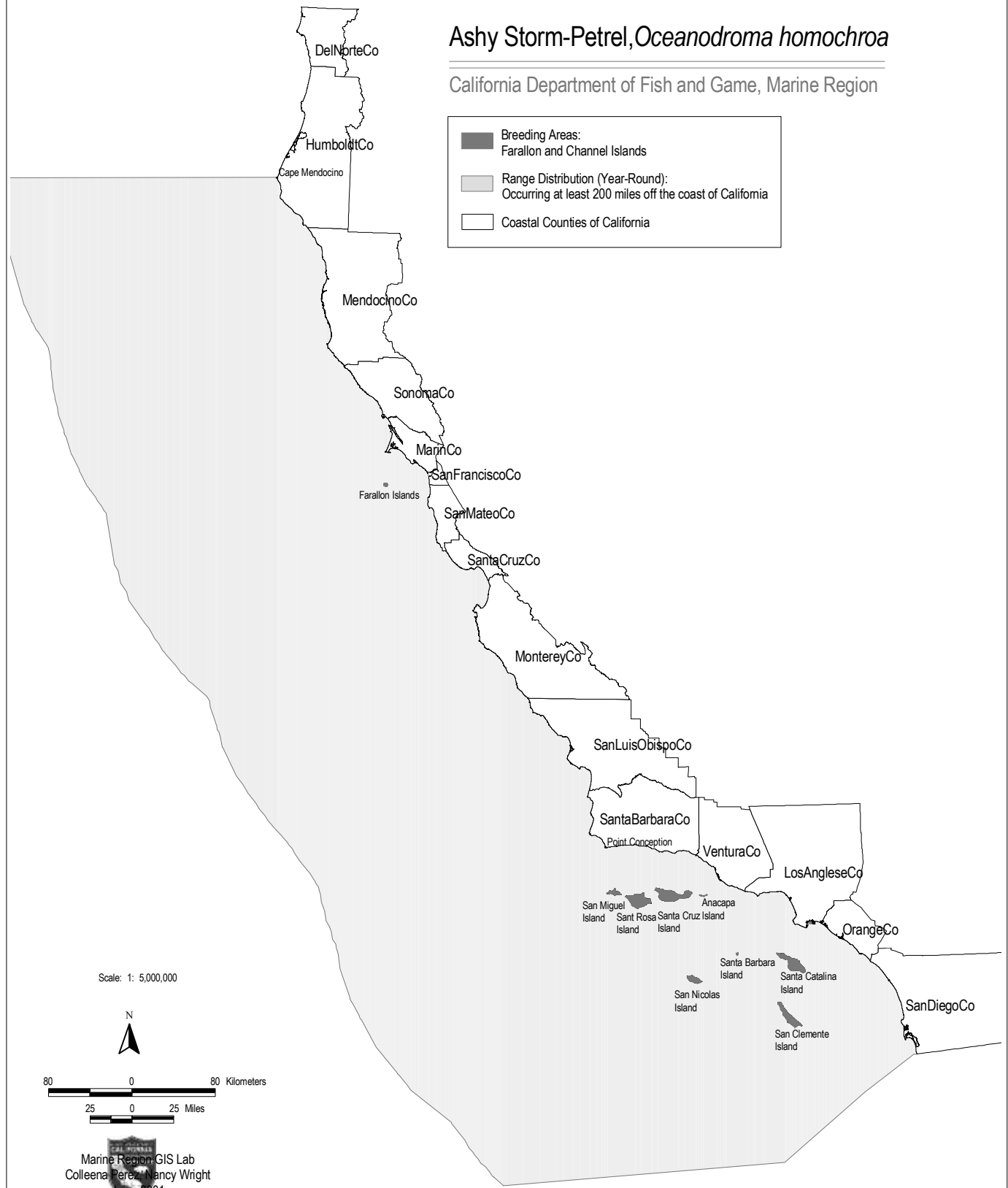
G-1

Fmp-gen-marinedist

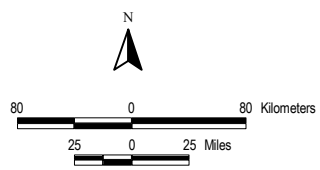
Ashy Storm-Petrel, *Oceanodroma homochroa*

California Department of Fish and Game, Marine Region

-  Breeding Areas:
Farallon and Channel Islands
-  Range Distribution (Year-Round):
Occurring at least 200 miles off the coast of California
-  Coastal Counties of California



Scale: 1: 5,000,000



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June, 2001

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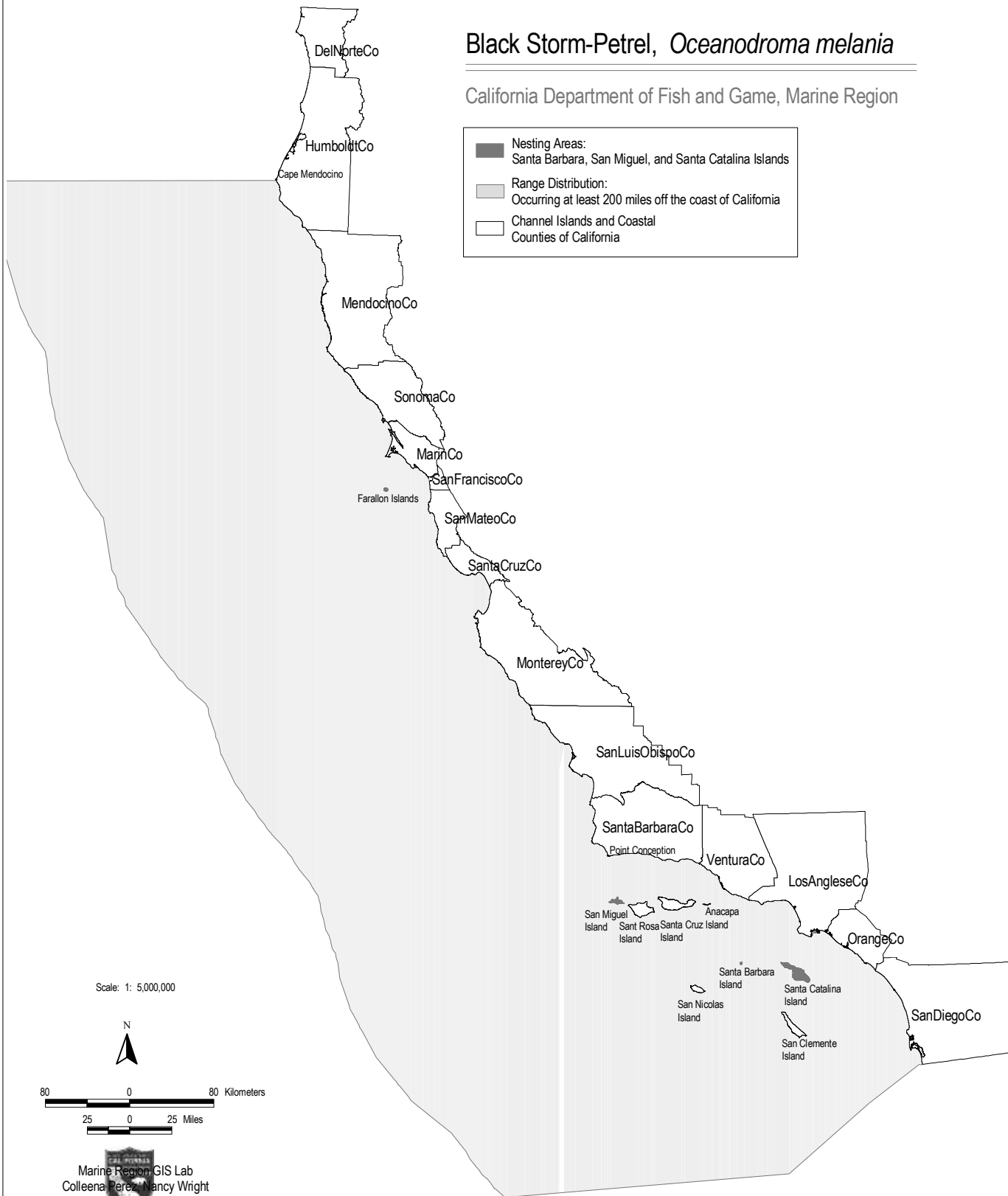
Black Storm-Petrel, *Oceanodroma melania*

California Department of Fish and Game, Marine Region

Nesting Areas:
Santa Barbara, San Miguel, and Santa Catalina Islands

Range Distribution:
Occurring at least 200 miles off the coast of California

Channel Islands and Coastal
Counties of California

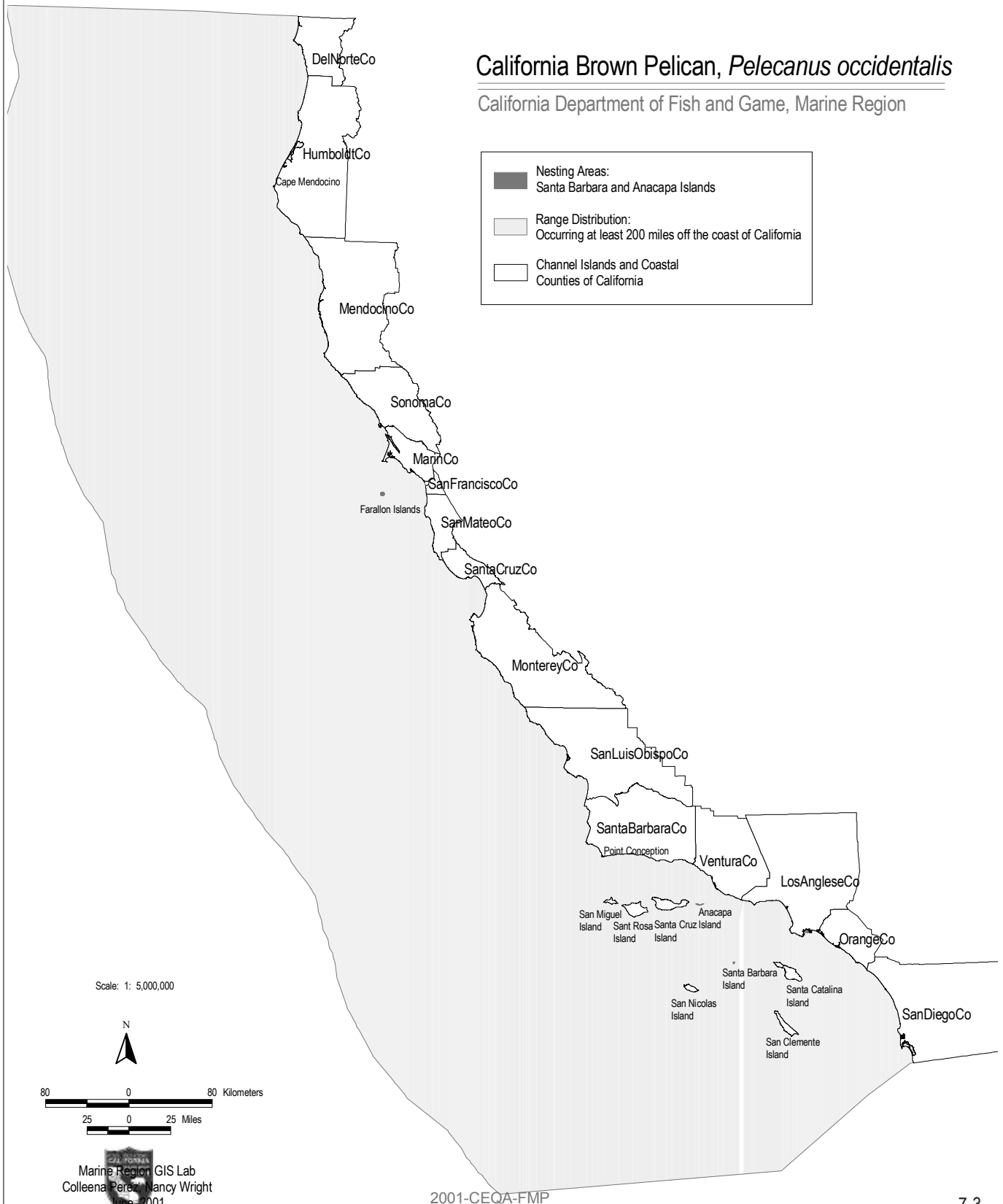
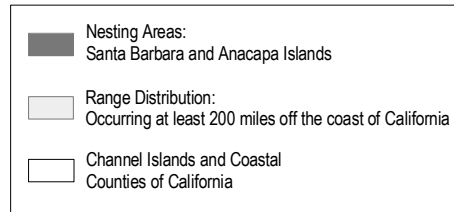


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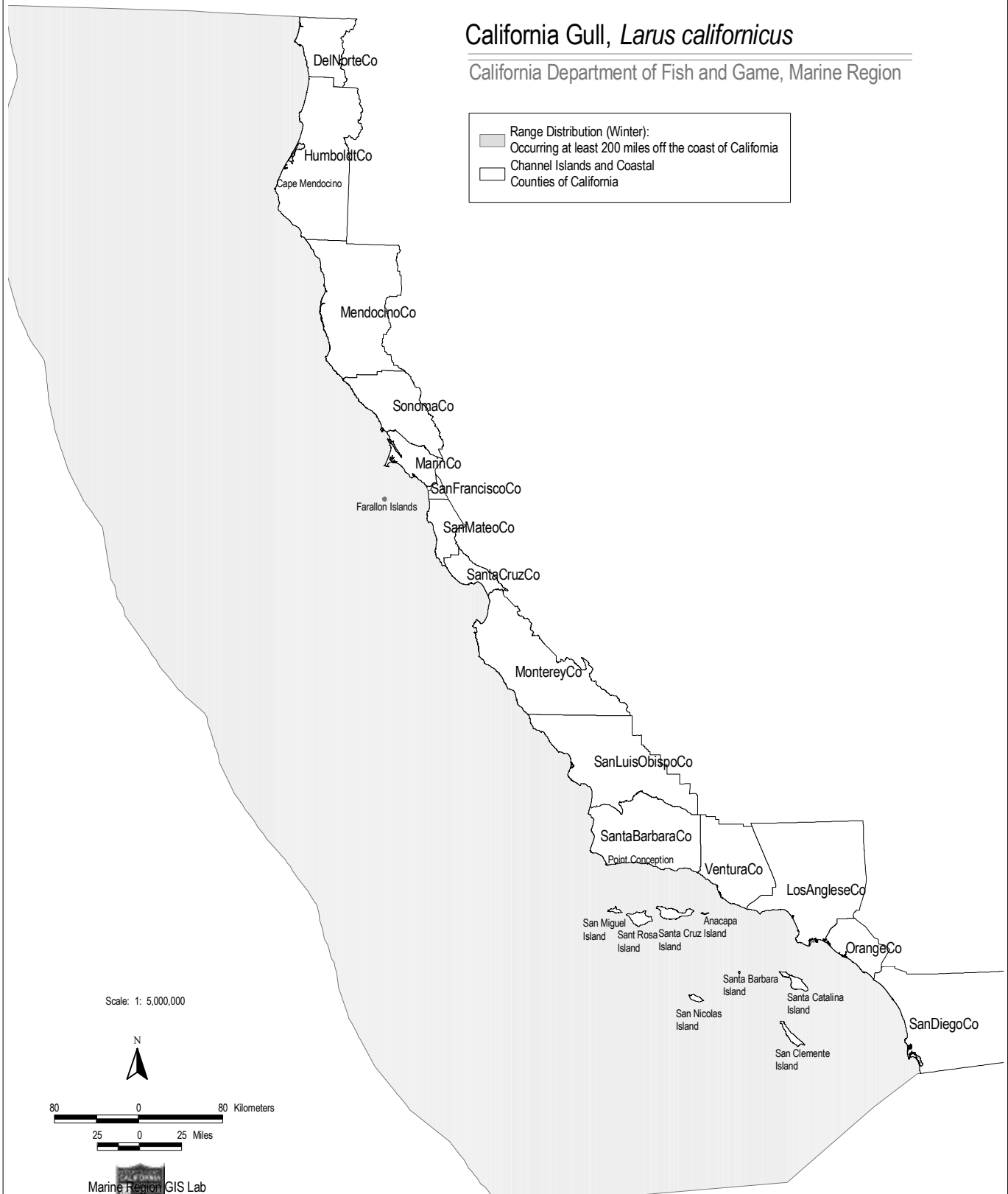
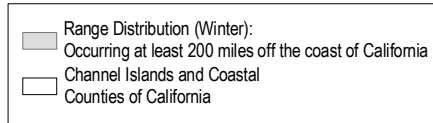
California Brown Pelican, *Pelecanus occidentalis*

California Department of Fish and Game, Marine Region

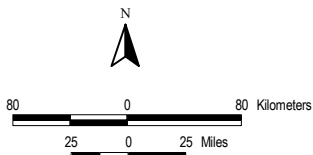


California Gull, *Larus californicus*

California Department of Fish and Game, Marine Region



Scale: 1: 5,000,000



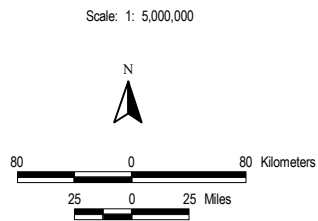
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Common Murre, *Uria aalge*

California Department of Fish and Game, Marine Region

- Nesting Areas:
Farallon Islands and other rocky Islands off Central California
- Range Distribution (Winter):
Occurring at least 200 mile off the coast of California
- Channel Islands and Coastal
Counties of California



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7-5

Fmp-Ch7-comu

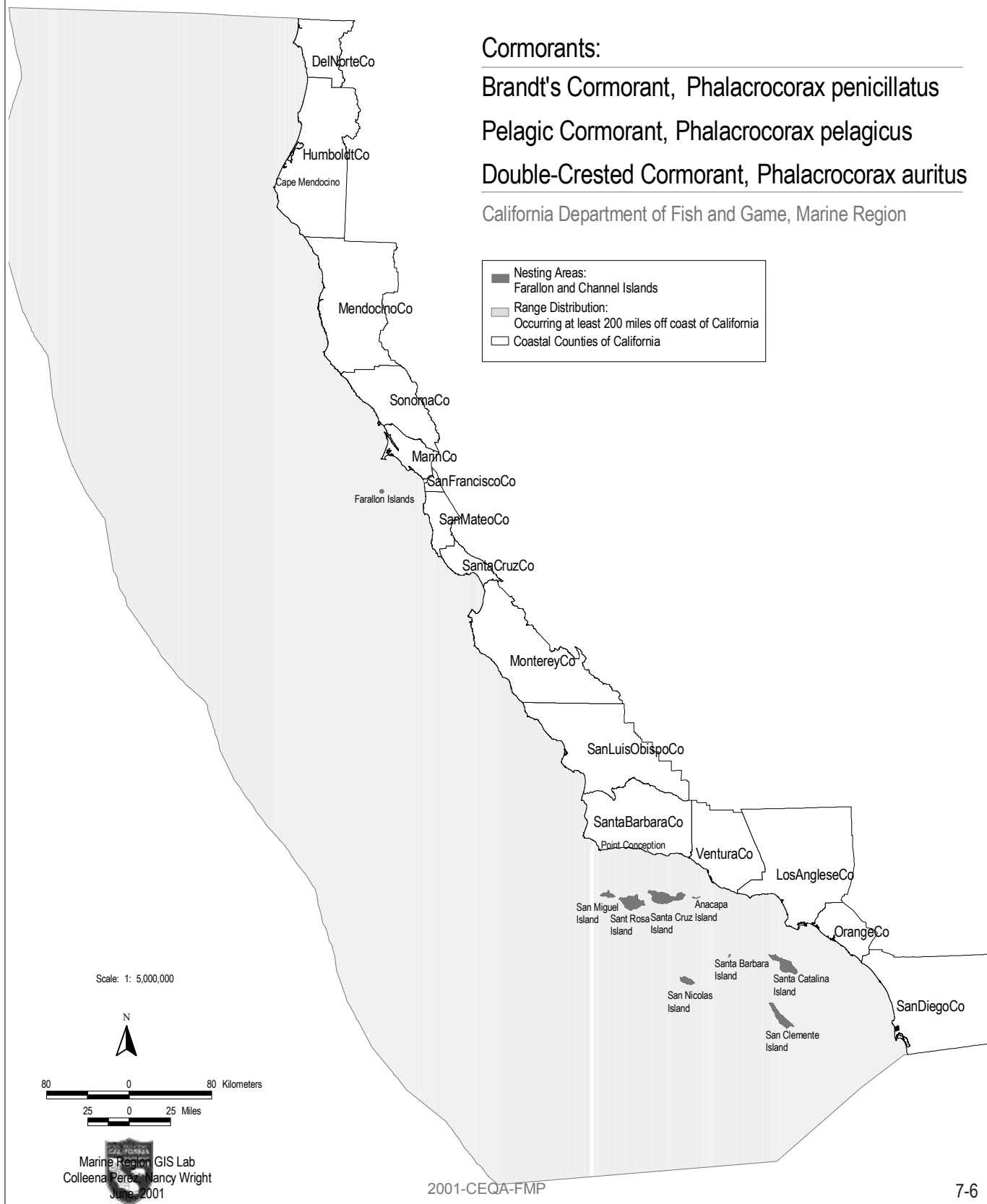
Cormorants:

Brandt's Cormorant, *Phalacrocorax penicillatus*

Pelagic Cormorant, *Phalacrocorax pelagicus*

Double-Crested Cormorant, *Phalacrocorax auritus*

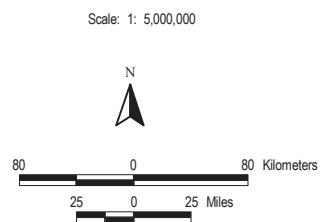
California Department of Fish and Game, Marine Region



Elegant Tern, *Sterna elegans*

California Department of Fish and Game, Marine Region

- Range Distribution (Winter):
South of Cape Mendocino; at least 200 miles off coast of California
- Range Distribution (Nesting):
South of San Diego; at least 200 miles off coast of California
- Channel Islands and Coastal
Counties of California



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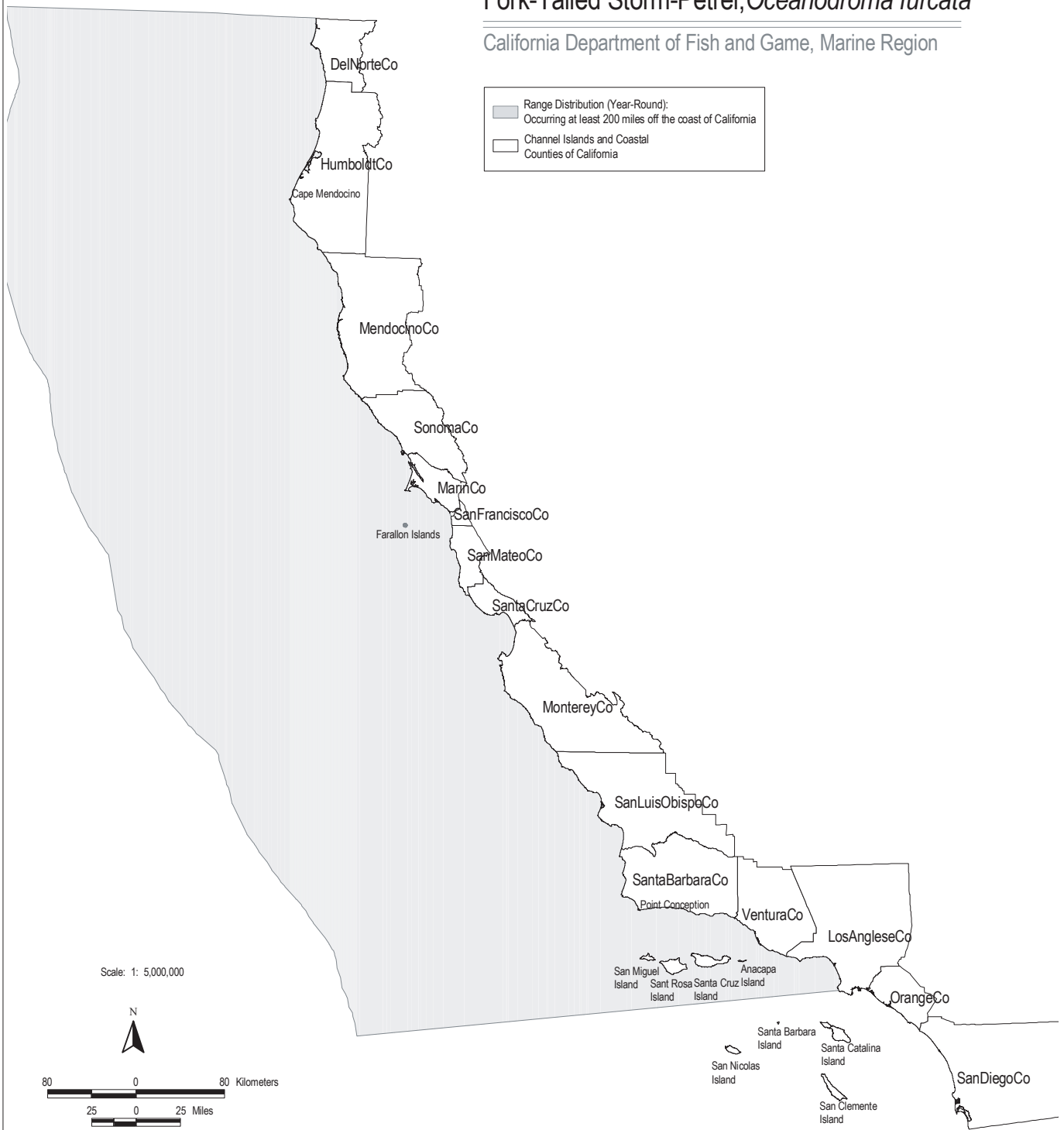
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7-7

Fmp-Ch7-elte

Fork-Tailed Storm-Petrel, *Oceanodroma furcata*

California Department of Fish and Game, Marine Region



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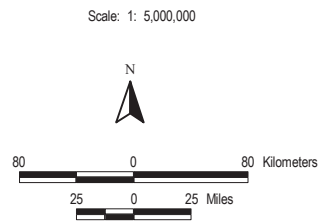
7-8

Fmp-Ch7-fope

Pacific Loon, *Gavia pacifica* Common Loon, *Gavia immer*

California Department of Fish and Game, Marine Region

- Range Distribution (Winter):
Occurring at least 200 miles off the coast of California
- Channel Islands and Coastal
Counties of California



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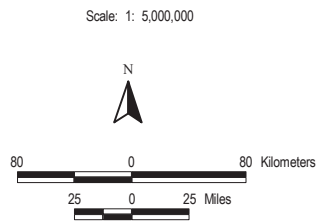
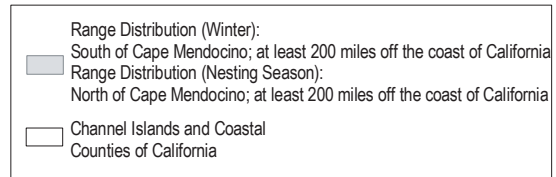
2001-CEQA-FMP

79

Fmp-Ch7-loon

Marbled Murrelet, *Brachyramphus marmoratus*

California Department of Fish and Game, Marine Region



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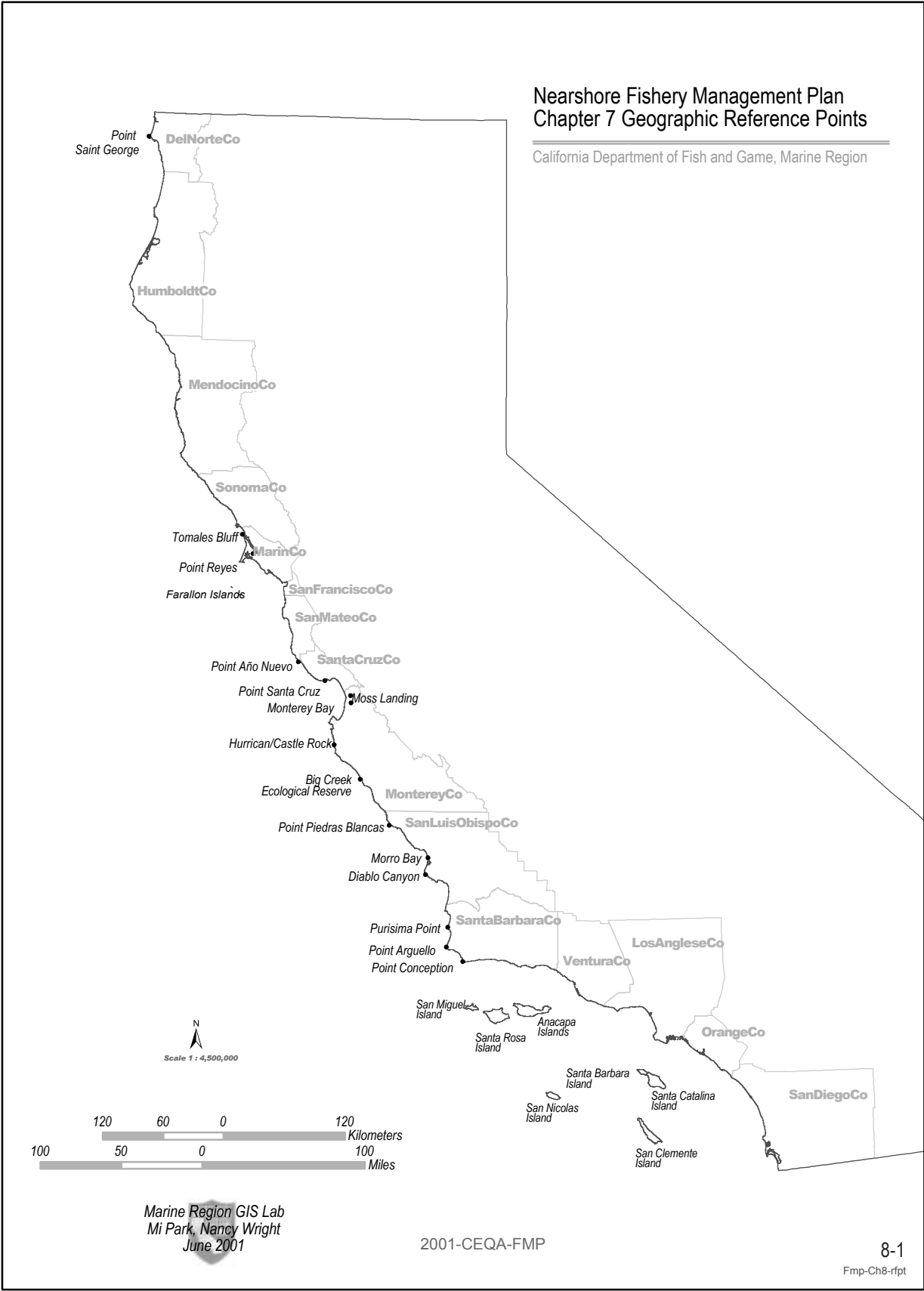
2001-CEQA-FMP

7-10

Fmp-Ch7-mamu

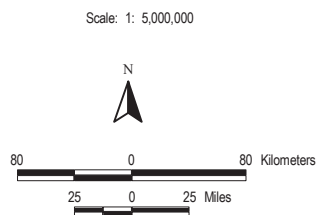
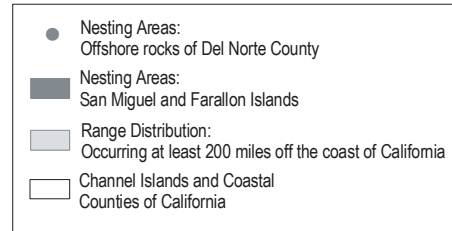
Nearshore Fishery Management Plan
Chapter 7 Geographic Reference Points

California Department of Fish and Game, Marine Region



Rhinoceros Auklets, *Cerorhinca monocerata*

California Department of Fish and Game, Marine Region



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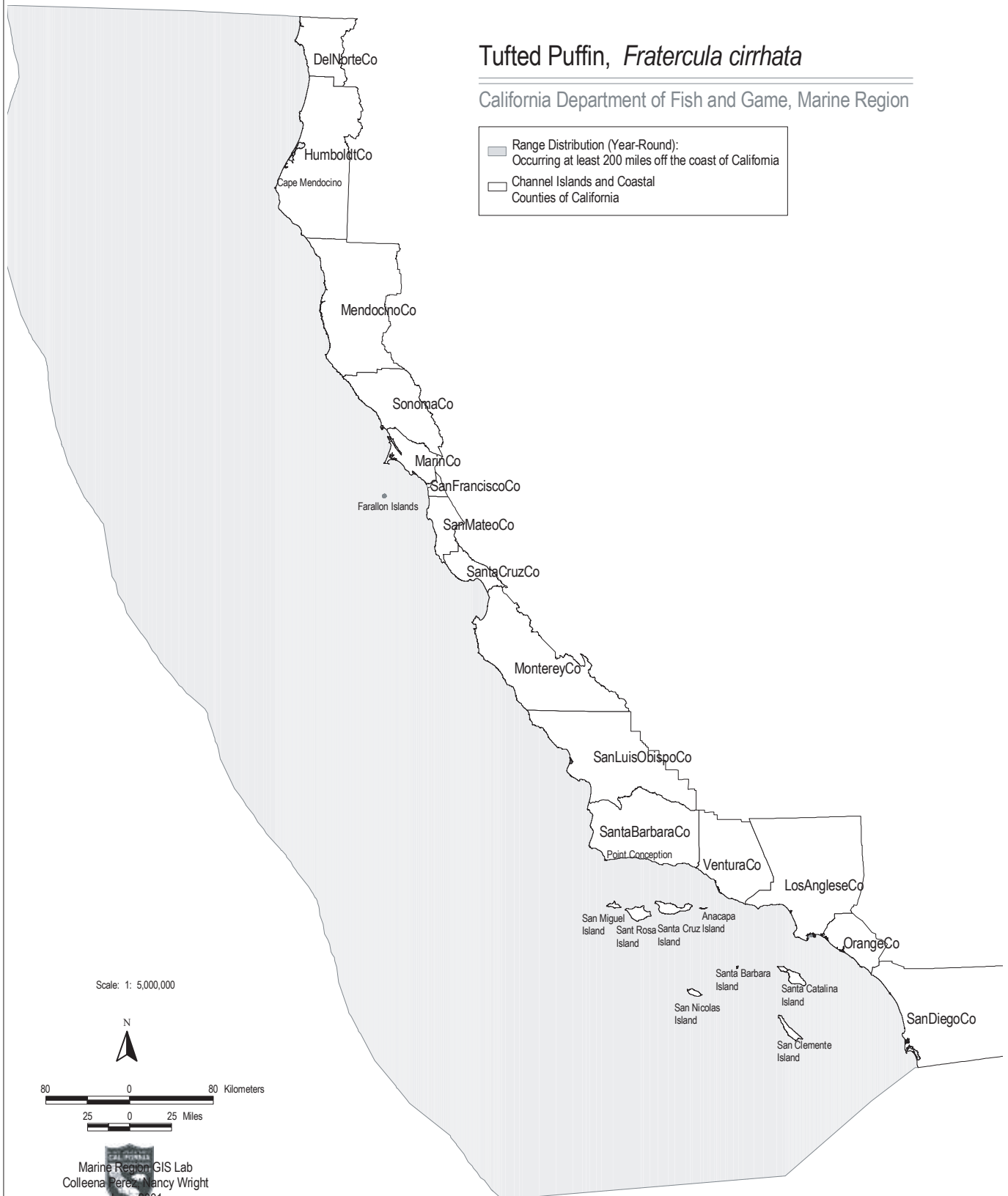
7-11

Fmp-Ch7-rhau

Tufted Puffin, *Fratercula cirrhata*

California Department of Fish and Game, Marine Region

- Range Distribution (Year-Round):
Occurring at least 200 miles off the coast of California
- Channel Islands and Coastal
Counties of California



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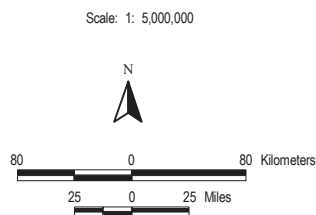
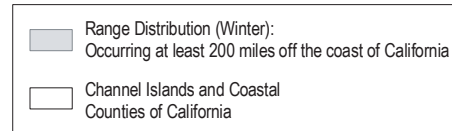
2001-CEQA-FMP

7-12

Fmp-Ch7-tupu

Western Grebe, *Aechmophorus occidentalis*

California Department of Fish and Game, Marine Region



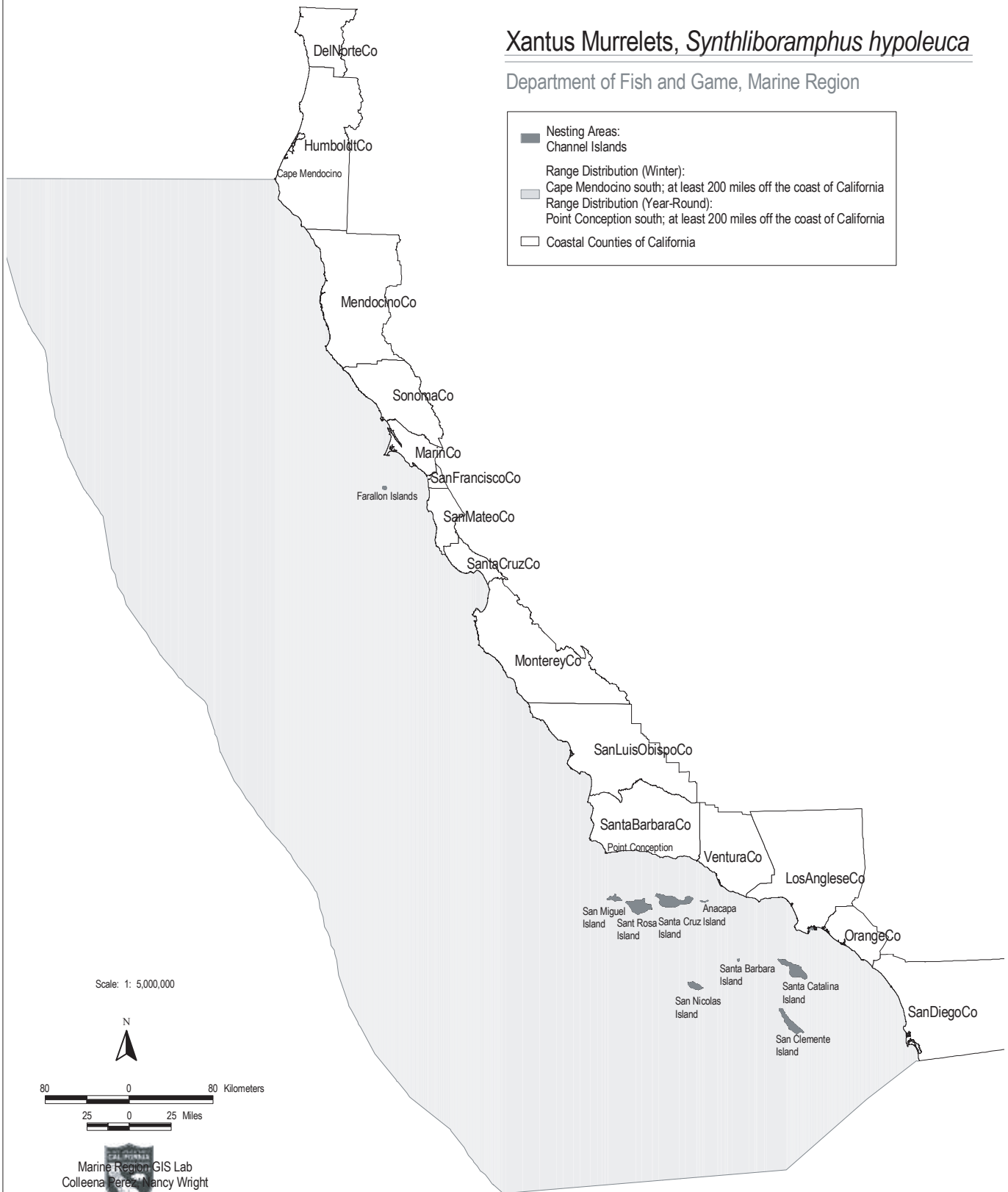
Marine Region GIS Lab
Coleena Perez, Nancy Wright
June, 2001

2001-CEQA-FMP

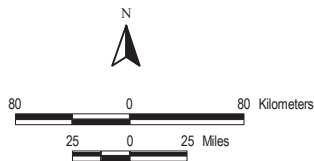
Xantus Murrelets, *Synthliboramphus hypoleuca*

Department of Fish and Game, Marine Region

- Nesting Areas:
Channel Islands
- Range Distribution (Winter):
Cape Mendocino south; at least 200 miles off the coast of California
- Range Distribution (Year-Round):
Point Conception south; at least 200 miles off the coast of California
- Coastal Counties of California



Scale: 1: 5,000,000



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June, 2001

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