

SENSITIVITY OF
COASTAL ENVIRONMENTS
TO SPILLED OIL

SOUTHERN CALIFORNIA

Prepared for:



Office of
Marine Pollution Assessment
Boulder, Colorado
80302

Prepared by:

Erich R. Gundlach
Larry C. Thebeau
James L. Sadd

Research Planning Institute, Inc.
925 Gervais Street
Columbia, South Carolina 29201

Robert Pavia
Will D. Ernst

NOAA/OMPA
Seattle, Washington 98115

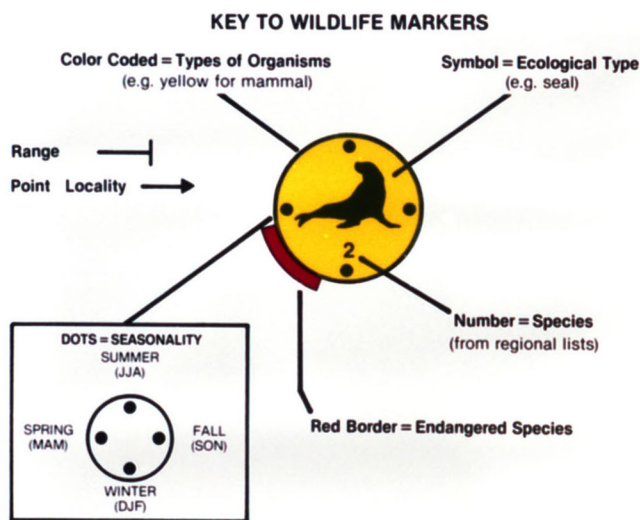
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Index to Southern California ESI Map Series

SHORELINE TYPES

Shoreline types are listed in order of increasing spill damage and persistence. Response measures should primarily protect environments 9 and 10. Cleanup measures for other shoreline types are discussed in the text.

- 1. Exposed rocky headlands and exposed seawalls.
- 2. Wave-cut platforms with or without thin sediment cover.
- 3. Fine-grained sand beaches.
- 4. Exposed medium- to coarse-grained sand beaches.
- 5. Sheltered sand beaches.
- 5a. Mixed sand, gravel, cobble and boulder beaches.
- 6. Exposed gravel/boulder beaches and exposed riprap structures.
- 8. Sheltered gravel/boulder beaches and sheltered riprap structures.
- 9. Sheltered tidal flats.
- 10. Marshland.
- Man-made sheltered inner-harbor structures



NUMBER KEY TO BIOLOGICAL DATA

REPTILES

- 14. Green Sea Turtles (*Chelonia mydas*)

MARINE COASTAL BIRDS

- A. Numerous Species
- 4. Red-Necked Grebe (*Podiceps grisegena*)
- 8. Double-Crested Cormorant (*Phalacrocorax auritus*)
- 9. Brandt's Cormorant (*Phalacrocorax penicillatus*)
- 10. Pelagic Cormorant (*Phalacrocorax pelagicus*)
- 13. Black Brant (*Branta bernicla nigricans*)
- 37. Western Gull (*Larus occidentalis*)
- 47. Pigeon Guillemot (*Cephus columba*)
- 49. Cassin's Auklet (*Ptychoramphus aleuticus*)
- 68. Black Oystercatcher (*Haematopus bachmani*)
- 70. Killdeer (*Charadrius vociferus*)
- 86. Least Tern (*Sterna albfrons*)
- 118. Brown Pelican (*Pelecanus occidentalis*)
- 125. Clapper Rail (*Rallus longirostris*)
- 139. Snowy Plover (*Charadrius alexandrinus*)
- 140. Belding Savannah Sparrow (*Passerculus sandwichensis beldingi*)
- 141. American Avocet (*Recurvirostra americana*)
- 142. Black-Necked Stilt (*Himantopus mexicanus*)
- 143. Xantus' Murrelet (*Endomychura hypoleuca*)
- 144. Ashy Storm Petrel (*Oceanodroma homochroa*)
- 145. Elegant Tern (*Sterna elegans*)

MARINE MAMMALS

- 1. Northern Sea Lion (*Eumetopias jubatus*)

- 2. Harbor Seal (*Phoca vitulina*)
- 3. Northern Fur Seal (*Callorhinus ursinus*)
- 22. California Sea Lion (*Zalophus californianus*)
- 23. Guadalupe Fur Seal (*Arctocephalus philippii*)
- 24. Northern Elephant Seal (*Mirounga angustirostris*)

FINFISH

- C. Anadromous Species
- 66. Pacific Herring (*Clupea harengus pallasii*)
- 74. Steelhead Trout (*Salmo gairdneri*)
- 106. Grunion (*Leuresthes tenuis*)

SHELLFISH

- A. Numerous Shellfish
- 18. Pismo Clam (*Tivela stultorum*)
- 21. Butter (Washington) Clam (*Saxidomus nuttallii*)
- 24. Gaper Clam (*Schizothaerus nuttallii*)
- 28. Razor Clam (*Siliqua sp.*)
- 29. Little-Neck Clam (*Paphia staminea*)
- 32. Geoduck Clam (*Panope generosa*)
- 35. Rock Scallop (*Hinnites giganteus*)
- 52. Bean Clam (*Donax gouldii*)
- 57. California Sea Mussel (*Mytilus californianus*)
- 60. Abalone species
- 61. Red Abalone (*Haliotis rufescens*)
- 62. Black Abalone (*Haliotis cracherodii*)
- 66. Jackknife Clam (*Tagelus californianus*)
- 67. Spiny Cockle (*Cardium quadragenarium*)

SOCIOECONOMIC FEATURES

Commonly these areas should receive priority protection or cleanup.

Parks and beaches

Marinas

Mariculture operations

Reserves, preserves, refuges and ecological areas.

ASBS Areas of special biological significance

SPILL RESPONSE INFORMATION

In conjunction with U.S. Coast Guard Strike team member, Don Gutknecht, these measures were primarily designed to protect ESI environments 9 and 10, and marinas (designated as high socioeconomic importance).

Boom placements

Inlet closures

Skimmers

Washover locations

BIOLOGICAL FEATURES

WILDLIFE SYMBOLS AND OCCURENCES

RESIDENT MARINE MAMMALS

- Sea Otters
- Seals or Sea Lions

Resident, feeding and pupping areas
Haulout grounds or pupping areas

MARINE BIRDS

- Wading birds
- Diving Birds
- Alcid or Petrels
- Waterfowl
- Shorebirds
- Gulls or Terns

Rails, Avocets and Oystercatchers nesting and feeding areas
Pelican or Cormorant feeding and roosting areas
Auklet, Guillemot, Murrelet, or Petrel rookeries
Duck, Goose, or Brant forage areas
Plover, Sparrow, Stilt or Killdeer forage areas or rookeries
Rookeries or forage areas

FISH

- Grunion or Herring
- Steelhead Trout

Spawning areas
Spawning or nursery areas

SHELLFISH

- Clams
- Abalone

Clam, Scallop, or Mussel areas
Abalone areas

REPTILES

- Turtle

Green Sea Turtle areas

PLANTS

- Kelp
- Seagrass

Abundant brown algae beds
Subtidal eelgrass beds

NUMBER KEY TO PRESERVES, RESERVES, REFUGES, AND ECOLOGICAL AREAS

AREA	ADMINISTERING AGENCY
1. Andre Clark Bird Refuge	City of Santa Barbara
2. Santa Monica Mountains National Recreation Area	U.S. National Park Service
3. Abalone Cove Ecological Reserve	California Fish and Game
4. Portuguese Bend Significant Ecological Area	Los Angeles County
5. Point Fermin Marine Life Refuge	California Fish and Game
6. Seal Beach National Wildlife Refuge	U.S. Fish and Wildlife Service
7. Bolsa Chica Ecological Reserve	California Fish and Game
8. Upper Newport Bay State Ecological Reserve	California Fish and Game
9. Newport Beach Marine Life Refuge	California Fish and Game
10. Irvine Coast Marine Life Refuge	California Fish and Game
11. Laguna Beach Marine Life Refuge	California Fish and Game
12. Heisler Park Ecological Preserve	California Fish and Game
13. South Laguna Beach Marine Life Refuge	California Fish and Game
14. Niguel Marine Life Refuge	California Fish and Game
15. Dana Point Marine Life Refuge	California Fish and Game
16. Doheny Beach Marine Life Refuge	California Fish and Game
17. Buena Vista Lagoon Ecological Reserve	California Fish and Game
18. San Elijo Lagoon Natural Preserve	California Fish and Game
19. Los Peñasquitos Lagoon Natural Preserve	California Fish and Game
20. Torrey Pines State Reserve	California Parks and Recreation
21. San Diego Marine Life Refuge	California Fish and Game
22. San Diego-La Jolla Ecological Reserve	California Fish and Game
23. Kendall-Frost State Ecological Reserve	California Fish and Game
24. Point Loma Ecological Reserve	California Fish and Game
25. Tijuana Slough National Wildlife Refuge	U.S. Fish and Wildlife Service
26. Border Field State Park Natural Preserve	California Parks and Recreation