

SENSITIVITY OF
COASTAL ENVIRONMENTS
TO SPILLED OIL

SOUTHERN CALIFORNIA

Prepared for:



Office of
Marine Pollution Assessment
Boulder, Colorado
80302

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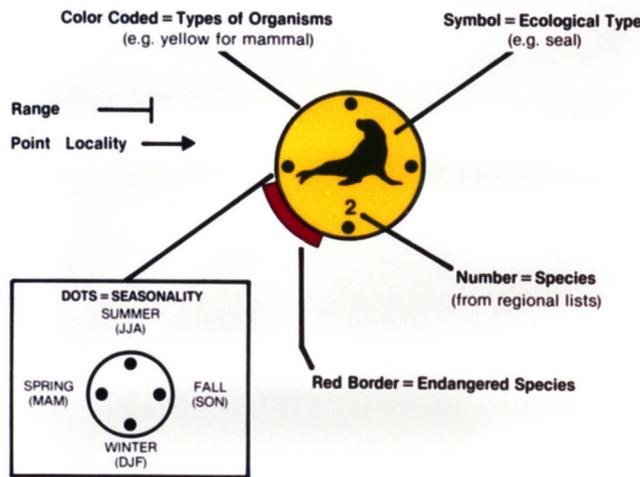
Index to Southern California ESI Map Series

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

KEY TO WILDLIFE MARKERS



NUMBER KEY TO BIOLOGICAL DATA

REPTILES

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

MARINE COASTAL BIRDS

- A. Numerous Species
- 4. Red-Necked Grebe (*Podiceps griseogenus*)
- 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 albigularis*)
- 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
- Skimmers
- Inlet closures
- 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 |