# ENVIRONMENTAL SENSITIVITY INDEX — MIDCOAST AND DOWNEAST MAINE

## SHORELINE TYPES

The entire shoreline of the study area was classified during low-altitude surveys undertaken in October and November 1984, augmented by ground surveys from the same time period and from 1976. The types of coastline found within the study area are ranked below in order of increasing sensitivity to spilled oil based upon observations made at numerous oil spills. Environments 8, 9 and 10 are very sensitive to spilled oil and deserve priority protection.

Sensitivity ↓

1. Exposed rocky shores.
2. Exposed rocky ledges.
3. Fine-grained sand beaches.
4. Coarse-grained sand beaches.
5. Mixed sand and gravel beaches.
6A. Gravel beaches.
6B. Riprap structures.
7. Exposed tidal flats (moderate-to-high biomass).
8. Sheltered rocky shores.
9. Sheltered tidal flats.
10. Marshes.

Unranked — Harbor structures (concrete, metal and wood, etc.).

## BIOLOGICAL RESOURCES

The biological resources of the study site were identified using previous studies primarily undertaken by the Department of Marine Resources, Maine; the U.S. Fish and Wildlife Service, and the U.S. National Marine Fisheries Service. Although these Maine waters are home to a vast number of marine life forms, the species represented on the ESI maps were selected based on commercial or recreational (sport) importance, protection under federal or state legislation, restriction (in part ot totally) by their life habitat to a shoreline existence. Areas having designated biological resources should receive high consideration during a spill incident. The symbols used to indicate these resources are presented below:

RESIDENT MARINE MAMMALS

| | |
|---|---|
| Seals | Haulout grounds or pupping areas |

MARINE BIRDS

| | |
|---|---|
| Wading Birds | Heron, egret, rail, and related bird nesting and feeding areas |
| Diving Birds | Loon, grebe, cormorant, and related bird nesting and feeding areas |
| Waterfowl | Migratory waterfowl areas |
| Shorebirds | Most common feeding areas |
| Gulls or Terns | Rookeries or feeding area |
| Raptors | Ospreys, eagles found in coastal areas |

SHELLFISH

| | |
|---|---|
| Lobster | General lobster area |
| Clams | Clam, scallop, or mussel areas |

FINFISH

| | |
|---|---|
| Fish | Fish concentrations (nearshore and riverine) |
| Flatfish | Flounders (only when noted separately on the marker key) |

OTHER INVERTEBRATES

| | |
|---|---|
| Worm bed | Major intertidal worm beds |

## KEY TO SPECIES

MARINE MAMMALS

| | | |
|---|---|---|
| 2 | Harbor seal | |

COASTAL BIRDS

| | | |
|---|---|---|
| A | Various marine species | |
| B | Various species of shorebirds | |
| C | Various species of waterfowl | |
| D | Various species of diving birds | |
| E | Various species of wading birds | |
| 8 | Double-crested cormorant | *Phalacrocorax auritus* |
| 38 | Herring gull | *Larus argentatus* |
| 45 | Common tern | *Sterna hirundo* |
| 54 | Great blue heron | *Egretta herodias* |
| *76 | Bald eagle | *Haliaeetus leucocephalus* |
| 77 | Osprey | *Pandion haliaetus* |
| 80 | Arctic tern | *Sterna paradisaea* |
| 86 | Least tern | *Sterna albifrons* |
| 87 | Little blue heron | *Egretta caerulea* |
| 89 | Snowy egret | *Egretta thula* |
| 90 | Black-crowned night heron | *Nycticorax nycticorax* |
| 91 | Glossy ibis | *Plegadis falcinellus* |
| 92 | Great black-backed gull | *Larus marinus* |
| 94 | Louisiana heron | *Hydranassa tricolor* |
| 95 | Roseate tern | *Sterna dougallii* |
| 96 | Leach's storm petrel | *Oceanodroma leucorhoa* |
| 98 | Laughing gull | *Larus atricilla* |
| 103 | Common eider | *Somateria mollissima* |
| 112 | Black guillemot | *Cepphus grylle* |
| 187 | Razorbill | *Alca torda* |
| 188 | Common puffin | *Fratercula arctica* |

Nesting Pairs

| Number | Symbol |
|---|---|
| 10 | △ |
| 10-100 | ○ |
| 101-1000 | □ |
| 1001-5000 | ● |
| 5000 | ■ |

INSHORE OR ANADROMOUS FISH

| | | |
|---|---|---|
| 84 | Rainbow smelt | *Osmerus mordax* |
| 85 | Alewife | *Alosa pseudoharengus* |
| 86 | Blueback herring | *Alosa aestivalis* |
| 87 | American shad | *Alosa sapidissima* |
| 88 | Winter flounder | *Pseudopleuronectes americanus* |
| 98 | American eel | *Anguilla rostrata* |
| 99 | Atlantic tomcod | *Microgadus tomcod* |
| 100 | Brown trout (sea run) | *Salmo trutta* |
| 102 | Atlantic sturgeon | *Acipenser oxyrhynchus* |
| 104 | Striped bass | *Morone saxatilis* |
| 144 | Atlantic salmon | *Salmo salar* |
| 145 | White perch | *Morone americana* |
| 147 | Atlantic mackeral | *Scomber scombrus* |
| 148 | Silver hake | *Merluccius bilinearis* |
| 149 | Atlantic cod | *Gadus morhua* |
| 153 | Northern kingfish | *Menticirrhus saxatilis* |
| 154 | American pollock | *Pollachius scombrus* |
| 155 | Squirrel hake (ling) | *Urophyscis chuss* |

SHELLFISH

| | | |
|---|---|---|
| 25 | Soft-shell clams | *Mya arenaria* |
| 34 | Atlantic deep-sea scallops | *Placopecten magellanicus* |
| 42 | Hard-shell clams (quahogs) | *Mercenaria mercenaria* |
| 45 | American lobster | *Homarus americanus* |

*Threatened or endangered (state or federal list).

## SOCIOECONOMIC FEATURES

The following information is provided to highlight those areas having high economic importance in order to aid or direct the response effort. This information is primarily derived from published reports of the Maine Department of Marine Resources, as yet unfinished for the state. Other features such as fish weirs and lobster-holding facilities were observed during the aerial survey. The symbols present on this map series are:

- Marinas and yacht clubs
- Parks, preserves and conservation easements
- Recreational beaches
- Industrial intakes
- Lobster-holding facilities and pens
- Aquaculture facilities
- Power plants
- Field survey sites
- State-designated critical areas
- Boat ramps

PARKS, PRESERVES, AND CONSERVATION EASEMENTS

| | |
|---|---|
| NC | Nature Conservancy, 729-5181 |
| ME | Department of Inland Fisheries and Wildlife, 289-3821 |
| AS | Audubon Society, 781-2330 |
| SP | State Parks (listed) - Contact park manager |
| NWR | National Wildlife Refuges - Contact refuge manager |
| ANP | Acadia National Park - Contact park manager |
| TP | Town Park - Contact town manger |

INDUSTRIAL INTAKES [(from Card and Aho (1982); and Card, pers. commun. (1985)]

1. Maine Yankee Atomic Plant (Map 2) 882-6321
2. Central Maine Power (Map 2) 882-7115
3. Maine Department of Marine Resources (Map 1) 633-5575
4. Ira C. Daring Center (Map 5) 563-3146/3940
5. Stinson Canning Co. (Map 16)
6. Port Clyde Foods, Inc. (Map 16)
7. North Lubec Manufacturing and Canning Co. (Map 16)
8. Marine Colloids (Map 16)
9. Seapro, Inc. (Map 16)
10. Stinson Cannery (Map 19)
11. Stonington Packing Co. (Map 33)

## SOCIOECONOMIC FEATURES (continued)

AQUACULTURE SITES [(from Card and Aho (1983); and Card, pers. commun. (1985)]

1. Gem Farms (Map 2) 563-3670/633-3127
   Newcastle, blue mussels
2. Dodge Cove (Map 4) 644-8624/563-8168
   Newcastle, oysters
2A. Meadow Cover Sea Farm (Map 4) 633-5102
   Boothbay, European oysters
3. Maine Mariculture (Map 5) 644-8427
   Newcastle, oysters
4. Harry's Sea Farm (Map 5) 563-5938
   Newcastle, European oysters and blue mussels
5. Dodge Cove Marine Farm (Map 5) 644-8624/563-8168
   Newcastle, South Bristol, European oysters
6. Gulf of Maine Oyster Growers (Map 5) 882-3445
   Damariscotta, European oysters
7. Maine Mooring Oyster Co., Inc. (Map 5) 644-8164
   Walpole, European oysters
8. MARITEC (Map 5) 644-8180
   Walpole, blue mussels and European oysters
9. Culture Fisheries Corp. (Map 5) 563-3226
   Newcastle, oysters
10. Abandoned Farms, Inc. (Map 5) 563-3935
    Damariscotta, blue mussels, European oysters, and American oysters
11. Paul Durgin (Map 5) 563-5026
    Walpole, European oysters
12. Mary Parmley (Map 6) 563-5872
    Newcastle, American oyster
13. Bristol Shellfish Farms (Map 8) 529-5634/5210
    Bristol, quahogs, European oysters, and American oysters
14. John Stotz Site (Map 8) 529-5566
    Bremen, bottom culture (30 acres)
15. Donald E. Davey Site (Map 11) 832-5080
    Friendship, European oysters
16. Friendship Trap Co. (Map 11) 354-2545
    Friendship, mussels (experimental)
17. W. S. Foster Site 1 (Map 11) 289-2291
    Friendship, bottom culture (pilot scale)
18. Agmar Blue Mussel Farms (Map 11) 372-6507
    St. George, mussels
19. Great Eastern Mussel Farms (Map 13) 372-6317
    St. George, mussel tanks (with intakes)
20. Mike and Joe's Seafarm (Map 21)
    Crockett Cove, Vinalhaven, mussel bottom culture
21. Northport area (Map 24)
    Oysters, but mostly inoperative
22. R. Burgess, J. Hamblen, and Great Eastern Mussel (Map 33)
    Camp Island, mussel bottom culture
23. G. Blastow, R. Larrabee, Sr., and Great Eastern Mussel (Map 33)
    Webb Cove, mussel bottom culture
24. D. Hutchinson (Map 33)
    Buckman Neck, mussel bottom culture
25. M. Haskell (Map 34)
    Eaton Island, mussel long line
26. Little Dear Island (Map 34)
    Marine farm mussels

LOBSTER-HOLDING FACILITIES [(from Card and Aho (1982, 1983); and Card, pers. commun. (1985)]

1. Five Island Seafood (Map 1) 371-2145/443-9064
   Georgetown
2. Lusty Lobster (Map 1) 529-5184/882-7781
   Southport
3. Mill Cove Lobster Pound (Map 1) (202) 633-3340
   Boothbay
4. Francis Lobster Pound (Map 1) 633-3307/4258
   Boothbay
5. Robinson's Wharf, Division of Fisheries (Map 2) 633-3803/3033
   Southport
6. Bristol Lobster Sales (Map 2) 633-2204
   Boothbay Harbor
7. Farrins Lobster Pound (Map 4) 644-8500
   South Bristol
8. South Bristol Fisherman's Co-op (Map 4) 644-8224
   South Bristol
9. Little River Lobster Co. (Map 4) 633-2648
   Boothbay
10. New Harbor Co-op (Map 8) 677-2791
    New Harbor
11. Small Brothers Wharf, Inc. (Map 8) 677-2200
    New Harbor
12. Midcoast Lobster (Map 8) 529-5622
    Round Pond
13. Muscongers Bay Lobster Co. (Map 8) 529-5528/5584
    Round Pond
14. Bernard Zahn, Inc. (Map 8) 529-5543
    Bremen
15. Lusty Lobster (Map 8) 529-5184
    Bremen
16. W. A. Reed and Sons (Map 11) 832-4053
    Friendship
17. Simmons Lobster Co. (Map 11) 832-4936
    Friendship
18. Bramhalls Lobster Wharf (Map 11) 832-5153
    Friendship
19. Friendship Harbor Marine, Division of Nelson Marine (Map 11) 832-5056
    Friendship
20. Coastal Fisheries (Map 11) 832-5517
    Friendship
21. Wallace's Shellfish, Inc. (Map 11) 832-4435
    Friendship
22. Young's Lobster (Map 11) 354-2313
    Cushing
23. The Lobster Factory (Map 11) 354-6020
    Cushing
24. Port Clyde Fishermen's Co-op (Map 11) 372-8922
    Port Clyde
25. Atwood Brothers, Inc. (Map 11) 372-8922
    Port Clyde
26. Johnny's Wharf (Map 11) 372-6717
    Port Clyde
27. Gary Davis (Map 11) 372-8140/8992
    Port Clyde
28. Edward L. Black (Map 11) 372-8116/6211
    Port Clyde
29. Cod End Market (Map 13) 372-6782
    Tenants Harbor
30. Art's Lobster Co., Inc. (Map 13) 372-6265
    Tenants Harbor
31. Seacoast Lobster Co. (Map 13) 372-6252
    St. George
32. Atwood Brothers Inc. (Map 13) 372-6331
    St. George
33. Miller Lobster (Map 14) 594-7406
    S. Thomaston
34. Spruce Head Fishermen's Co-op (Map 15) 594-7980
    S. Thomaston
35. Wm. Atwood Lobster Co. (Map 15) 594-2317
    S. Thomaston
36. McLoon Lobster Co. (Map 28) 594-4231
    S. Thomaston
37. Maine Coast Seafoods (Map 16) 596-6481
    S. Thomaston
38. Reeds Wharf - Atwood Bros., Inc. (Map 16)
    Owls Head Harbor
39. Owls Head Lobster Co. (Map 16)
    Owls Head Harbor
40. Ash Point (Map 16)
    Rockland
41. Black Pearl (Map 16)
    Rockland
42. Maine Way Lobster
    Rockland
43. Jordan's Market (Map 16)
    Rockland
44. Sailoft Restaurant (Map 17)
    Rockport
45. Grayfarm Brothers (Map 17)
    Rockport
46. Waterfront Restaurant (Map 17)
    Camden
47. Ayres Market (Map 17)
    Camden
49. Lobster Pound Restaurant (Map 18)
    Lincolnville
50. Beach Inn (Map 18)
    Lincolnville
51. City Lobster Co. (Map 19)
    Belfast
52. Young's Lobster Pound (Map 19)
    Belfast Bay
53. B. O. Radley (Map 20)
    Matinicus
54. Art's Lobster (Map 20)
    Matinicus
55. Superior Shellfish Co. (Map 24)
    Searsport Harbor
56. C. L. Bickford Lobster Co. (Map 25)
    4 pounds; in Dog Point, Norton Point, Vinalhaven, and Greens Island
57. Vinalhaven Fisherman's Co-op (Map 25)
    Vinalhaven
58. Island Lobster Corp. (Map 25)
    Vinalhaven
59. J. E. Brown, Inc. (Map 26)
    Vinalhaven
60. Dennet's Wharf (Map 28)
    Castine
61. Eatons Shipyard (Map 28)
    Castine
62. Fifield Lobster Co. (Map 33)
    Fifield Point
63. Clyde Cannery (Map 33)
    Stonington
64. Colwell Brothers Lobster Co. (Map 33)
    Stonington
65. Lobster Transport Co. (Map 33)
    Stonington
66. Stonington Lobster Co-op (Map 33)
    Stonington

# Description of Shoreline Types

## EXPOSED ROCKY SHORES — ESI = 1

- Common along the outer, exposed coast of the study site
- Composed of steeply-dipping to vertical bedrock
- Exposed to the high waves of the Atlantic Ocean
- Commonly contain barnacles along the upper intertidal zone; rockweed and mussels along the middle intertidal zone; and red and brown algae in the lower intertidal zone

### Predicted Oil Impact

- Most commonly, oil will be held offshore by waves reflecting off the steep cliffs
- On less steep shores, oil may come onshore
- Oil persistence is related to the incoming wave energy; during high-wave conditions, oil persistence is limited to days
- Oil trapped in tidal pools will kill resident organisms
- The damage to the intertidal community is expected to be relatively light with fairly rapid recovery
- Diving birds utilizing these rocky sites may be killed if oiled

### Recommended Response Activity

- On most shores, no cleanup is necessary (and may be dangerous)
- Access is usually difficult
- Cleanup of recreational areas may be necessary; high-pressure water spraying is effective while oil is still fresh

## EXPOSED ROCKY LEDGES — ESI = 2

- Very common along the coastal areas exposed to the Atlantic Ocean
- Consist of wave-cut or low-lying bedrock
- May be very wide due to large tidal range
- Commonly contain narrow, mixed-sediment beaches along the high-tide swash zone
- The lower intertidal zone contains extensive algae growth
- Tide pools and associated organisms are common in the lower-to-middle intertidal zone

### Predicted Oil Impact

- Incoming oil will commonly form a band along the high-tide swash line
- Tide-pool organisms may be killed
- Lower intertidal algae may escape damage depending on tidal stage and oil type and quantity
- Oil persistence is limited (days to weeks) in most high-energy areas

### Recommended Response Activity

- In most wave-exposed areas, cleanup is not necessary
- High recreational-use areas may be cleaned effectively using high-pressure water spraying if oil is still fresh
- Removal of organisms should be avoided

## FINE-GRAINED SAND BEACHES — ESI = 3

- Not common in the study site
- Generally occur as small pocket beaches
- Usually contain a broad, gently sloping profile
- Commonly backed by low-lying dunes
- May be mixed with shells or shell fragments
- Upper beach fauna are scarce
- Amphipods and crabs are dominant intertidal organisms

### Predicted Oil Impact

- Heavy oil accumulations will cover the entire beach face
- Light oil accumulations will be deposited as oily swashes along the upper intertidal zone
- Oil penetration into the beach will be approximately 15 cm
- Organisms living in the beach sands may be killed either by smothering or by lethal oil concentrations in the water
- Shorebirds may be killed if oiled

### Recommended Response Activity

- Fine-grained sand beaches are among the easiest beach types to clean
- Cleanup should concentrate on the removal of oil from the upper swash zone after all oil has come ashore
- Removal of sand from the beach should be minimal to avoid erosion problems; special caution is necessary in areas backed by seawalls
- Activity through both oiled and dune areas should be severely limited
- Manual cleanup rather than use of road graders and front-end loaders is advised

## COARSE-GRAINED SAND BEACHES — ESI = 4

- Not at all common within the study area
- Usually have a moderate slope and are mixed with shell fragments
- May be present as small pocket beaches or as sand tombolo
- Contain low species density and diversity

### Predicted Oil Impact

- Commonly, oil will be deposited on and become mixed into the sand along the high-tide swash zone
- Oil may become deeply buried (30-50 cm) into the beach sands
- Oil may also penetrate (or seep) deeply into the beach
- Organisms resident in the beach are likely to be killed under moderate oil concentrations

### Recommended Response Activity

- Cleanup may be difficult because of relatively soft sediments
- Cleanup should concentrate on oil removal from the upper swash zone
- Sand removal should be minimal to avoid erosion problems
- Activity through the oiled sand should be limited to prevent grinding oil deeper into the beach
- Use of heavy equipment for oil/sand removal may result in the removal of excessive amounts of sand; manual cleanup may be more efficient

## MIXED SAND AND GRAVEL BEACHES — ESI = 5

- Very common throughout the study site
- Present in both sheltered and exposed areas
- Common as a narrow beach or stringer on top of bedrock platforms (ESI = 2)
- Composed of coarse-grained sand, gravels of varying sizes, and possibly shell fragments
- In active beaches, organisms are scarce due to the harshness of the environment
- In stable habitats, algae may be attached to the larger gravel or boulder components
- The larger rocks may also provide habitat for mussels, crabs, and snails

### Predicted Oil Impact

- Oil will be deposited primarily along the high-tide swash zone
- Under very heavy accumulations, oil may spread across the entire beach face
- Oil percolation into the beach may be up to 60 cm in well-sorted material
- Burial may be very deep along the berm
- Biota present may be killed by the oil, either by smothering or by lethal concentrations in the water column

### Recommended Response Activity

- Remove oil primarily from the upper swash lines
- Removal of sediment should be limited
- Mechanical reworking of the sediment into the wave zone and/or high-pressure water spraying can effectively remove the oil; sorbent booms may be necessary to capture oil outflow

## GRAVEL BEACHES — ESI = 6A

### RIPRAP STRUCTURES — ESI = 6B

- Gravel beaches are common throughout the study area (as pocket beaches in bedrock-dominated areas or as glacially derived material)
- Riprap structures act similarly to cobble/boulder-dominated shores
- Shell fragments and woody debris are also common beach components
- Biomass is generally very low in high-wave areas; at calmer sites, the population of fauna and attached algae may be fairly great; crabs, snails, mussels, barnacles, and attached algae are most common

### Predicted Oil Impact

- Under light-to-moderate concentrations, oil will be deposited primarily along the last high-tide swash zone
- With heavy oil quantities, the entire beach face may be covered
- Oil may percolate rapidly and deeply (up to 1 m) into the beach face
- If oil is left to harden, an asphalt/gravel pavement may result
- Resident fauna and flora may be killed by the oil

### Recommended Response Activity

- Removal of sediment should be restricted
- Pushing gravel into the active surf zone and use of high-pressure water spraying is effective at removing oil while it is still fresh
- Sorbent booms should be used to capture oil outflowing during the above cleansing process

## EXPOSED TIDAL FLATS (MOD. TO HIGH BIOMASS) ESI = 7

- Generally common as narrow flats fronting interior mixed sand and gravel beaches
- Visible only at low tide
- Exposed to low-to-moderate wave energy and/or tidal currents
- Composition is most commonly coarse-grained sand or mixed sand and gravel
- Species density and diversity may be high; soft-shell clams and worms are most important

### Predicted Oil Impact

- Most oil will be pushed across the flat as the tide rises
- Deposition of oil on the flat may occur on a falling tide if oil concentrations are heavy
- Biological damage may be severe

### Recommended Response Activity

- Cleanup is very difficult (and possible only during low tides)
- The use of heavy machinery should be restricted to prevent mixing oil into the sediments
- On sand flats, oil will be removed naturally from the flat and deposited on the adjacent beaches where cleanup is more feasible. In gravelly areas, oil may bind with the sediment; high-pressure water spraying may be necessary

## SHELTERED ROCKY SHORES ESI = 8

- Composed of bedrock outcrops, ledges, or boulders
- Located in calm, interior environments
- Particularly common throughout the study area
- Species density and diversity vary greatly, but barnacles, mussels, crabs, snails, and rockweed are often very abundant

### Predicted Oil Impact

- Oil will persist for several years especially between rocks
- Upper intertidal biota and algae will be most severely affected
- Algae present in the lower intertidal zone are most resistant to damage

### Recommended Response Activity

- These are areas needing priority protection using deflection booms, sorbent booms, and offshore skimmers
- High- and low-pressure water spraying is effective while oil is still fresh
- Cutting of oiled algae is generally not recommended

## SHELTERED TIDAL FLATS ESI = 9

- Very common in the estuaries and bays of the study site
- Present in calm-water habitats, sheltered from major wave activity
- Composed of muds
- Usually contain large populations of clams, worms, and snails; many of these flats are commercially harvested
- Bird life is seasonally abundant

### Predicted Oil Impact

- Oil may persist for many years
- Long-term oil incorporation into tidal-flat sediments is common
- Oil deposition will commonly occur along the upper fringes of the flat
- Very heavy oil accumulations will cover much of the flat surface
- Biological damage may be severe

### Recommended Response Activity

- This is a high-priority area necessitating the use of spill protection devices to prevent or limit oil spill impact; open-water, deflection, and sorbent booms and open-water skimmers should be used
- Cleanup of the flat surface after oiling is very difficult because of the soft substrate
- Manual operations from shallow-draft boats may be helpful

## MARSHES — ESI = 10

- Common as narrow, fringing marshes or as broad areas within estuaries
- Very sheltered from waves and tidal activity
- Composed primarily of *Spartina* grasses on an organic-rich mud base
- Crabs are particularly common
- Bird life is particularly abundant
- Marshes provide a nursery ground for numerous fish species

### Predicted Oil Impact

- Oil in heavy accumulations may persist for decades
- Small quantities of oil will be deposited primarily along the outer marsh fringe or along the upper wrack (debris) swash line
- Resident biota, including bird life, are likely to be oiled and possibly killed

### Recommended Response Activity

- Under light oiling, the best practice is to let the marsh recover naturally
- During winter months, surface ice commonly offers shoreline protection
- Cutting of oiled grasses and low-pressure water spraying are effective, especially during the early part of the spring growing season
- Heavy oil accumulations on the marsh surface should be removed manually; access across the marsh should be greatly restricted
- Cleanup activities should be carefully supervised to avoid excessive damage to the marsh

## MAN-MADE STRUCTURES — (NOT RANKED)

- Common in developed port areas
- Composed of concrete and stone, wooden or metal bulkheads, and wooden pilings
- Concrete and stone are most common along the outer coast (behind the beach) and along the sheltered residential areas
- Organisms and algae may be common on pilings
- Biota on concrete structures along the upper intertidal or supratidal zones is sparse

### Predicted Oil Impact

- Oil would coat the intertidal areas of solid structures
- Attached biota would be damaged or killed under heavy accumulations

### Recommended Cleanup Activity

- May require high-pressure spraying:
  - — to remove oil
  - — to prepare substrate for recolonization of barnacle and oyster communities
  - — for aesthetic reasons
- Cleanup may be advisable to minimize chronic leaching of oil from the structure