

# Central and Northern California Coastal Marine Habitats: Oil Residence and Biological Sensitivity Indices

## RELATIVE ABUNDANCE OF MAJOR MACROBIOTA\*

| Taxa                                  | A | B | C | D   | E   | F   | G   | H   | I   | J   | K   |
|---------------------------------------|---|---|---|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>ROCKY INTERTIDAL MACROBIOTA</b>    |   |   |   |     |     |     |     |     |     |     |     |
| Acorn barnacles                       |   |   |   |     |     |     |     |     |     |     |     |
| Chlorophyta                           |   |   |   | 0   | C   | C   | C   |     |     | C   | C   |
| Porphyra spp.                         |   |   |   | 0-C | 0-C | 0-C | 0-C |     |     | 0-C | C-A |
| Pelvetiopsis limitata                 |   |   |   | C   | C   | C   | C   |     |     | C   | C   |
| Endocladia muricata                   |   |   |   | C   | C   | C   | C   |     |     | C   | C   |
| Pelvetia fastigiata                   |   |   |   |     |     |     |     |     |     |     |     |
| Fucus distichus                       |   |   |   | C   | C   | C   | C   |     |     | C   | C   |
| Gigartina spp.                        |   |   |   | C   | C   | C   | C   |     |     | C   | C   |
| Pollicipes polymerus                  |   |   |   | 0-C | C   | C   | C   |     |     | C   | C   |
| Mytilus californianus                 |   |   |   | 0   | C   | C   | C   |     |     | C   | C   |
| Corallina spp./Gigartina spp.         |   |   |   | 0   | 0   | 0   | 0   |     |     | 0   | 0   |
| Postelsia palmaeformis                |   |   |   | 0   | 0   | 0   | 0   |     |     | 0   | 0   |
| Halosaccion glandiforme               |   |   |   | 0   | 0   | 0   | 0   |     |     | 0   | 0   |
| Iridaea spp.                          |   |   |   | 0-C | 0-C | 0-C | 0-C |     |     | 0-C | 0-C |
| Odonthalia spp./Rhodomela larix       |   |   |   | 0-C | 0-C | 0-C | 0-C |     |     | 0-C | 0-C |
| Coralline algae                       |   |   |   | 0   | 0   | 0   | 0   |     |     | 0   | 0   |
| Phyllospadix spp.                     |   |   |   | C   | C   | C   | C   |     |     | C   | C   |
| Alaria marginata                      |   |   |   | C   | C   | C   | C   |     |     | C   | C   |
| Egregia menziesii                     |   |   |   | C   | C   | C   | C   |     |     | C   | C   |
| Laminaria spp.                        |   |   |   | C   | C   | C   | C   |     |     | C   | C   |
| Lessoniopsis littoralis               |   |   |   | C   | C   | C   | C   |     |     | C   | C   |
| <b>OTHER MACROBIOTA</b>               |   |   |   |     |     |     |     |     |     |     |     |
| <b>Kelp beds:</b>                     |   |   |   |     |     |     |     |     |     |     |     |
| Macrocystis spp.                      |   |   |   |     |     |     |     |     |     |     |     |
| Nereocystis luetkeana                 |   |   |   | C   | C   | C   | C   |     |     | C   | C   |
| <b>Marine mammals:</b>                |   |   |   |     |     |     |     |     |     |     |     |
| Elephant seal                         |   |   |   |     |     | 0   | 0   | 0-C | 0-C |     |     |
| Harbor seal                           | 0 |   |   |     |     | C-A | C-A | 0-C | 0-C |     |     |
| Steller sea lion                      |   |   |   |     |     | 0-C | 0-C | 0-A | 0-A |     |     |
| California sea lion                   |   |   |   |     |     | 0-A | 0-A | 0-A | 0-A |     |     |
| <b>Seabird nesting colonies:</b>      |   |   |   |     |     |     |     |     |     |     |     |
| Fork-tailed storm petrel              |   |   |   |     |     |     |     | A   | A   | C   |     |
| Leach's storm petrel                  |   |   |   |     |     |     |     | A   | A   |     |     |
| Ashy storm petrel                     |   |   |   |     |     |     |     | A   | A   |     |     |
| Brandt's cormorant                    |   |   |   |     |     |     |     | A   | A   |     |     |
| Double-crested cormorant              |   |   |   |     |     |     |     | A   | A   |     |     |
| Pelagic cormorant                     |   |   |   | 0   | 0   | 0   | 0   | C-A | C-A | 0-C |     |
| Black oystercatcher                   |   |   |   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |     |
| Western gull                          |   |   |   | 0   | 0   | 0   | 0   | A   | A   | 0-A |     |
| Common murre                          |   |   |   |     |     |     |     | A   | A   |     |     |
| Pigeon guillemot                      |   |   |   | C   | C   | C   | C   | A   | A   | C   |     |
| Cassin's auklet                       |   |   |   |     |     |     |     | A   | A   |     |     |
| Rhinoceros auklet                     |   |   |   |     |     |     |     | 0-A | 0-A |     |     |
| Tufted puffin                         |   |   |   |     |     |     |     | C-A | C-A |     |     |
| <b>Threatened/Endangered Species:</b> |   |   |   |     |     |     |     |     |     |     |     |
| Aleutian Canada goose                 |   |   |   |     |     |     |     | C   | C   |     |     |
| Southern sea otter                    |   |   |   |     |     |     |     |     |     |     |     |

\*Relative abundance for summer conditions: 0 = occasional, C = common, A = abundant

## PHYSICAL SHORE-ZONE CHARACTERISTICS

| UNIT IDENTIFIERS                              | A   | B  | C                       | D  | E                                  | F  | G                           | H                 | I                                 | J  | K  |
|---|---|--|-------------------------|--|------------------------------------|--|-----------------------------|-------------------|-----------------------------------|--|--|
| ALONGSHORE LENGTH (km)                        | 7.5   | 3.0  | 0.3                     | 1.7  | 0.8                                | 0.6  | 2.4                         | 0.7               | 0.7                               | 0.9  | 0.5  |
| ACROSS-SHORE WIDTH (m)                        | 75-150  | 75-150   | -                       | 10-50  | 10-50                              | 10   | 50-75                       | <15               | <15                               | 30-50  | 30-50  |
| WAVE EXPOSURE                                 | 10  | 10   | 1-10                    | 10   | 10                                 | 10   | 10                          | 10                | 10                                | 10   | 10   |
| ACROSS-SHORE COMPONENTS (morphology, texture) | Dl, Cs<br>Bw, Cs<br>Bs, At<br>Cg<br>Bb, Cs<br>Bf, Cs<br>S, Cs | B1, Cs<br>Bs, At<br>Cg<br>Bb, Cps<br>Bf, Cs<br>S, Cs | Eb, Cs:<br>Bo<br>Ie, Cs | Ca, Rs<br>Bi, Ccb:<br>Rs<br>Pf, Ccb<br>Rs<br>Ore, Rs | Ca, Rs<br>Pf, Cgb<br>Rs<br>Ore, Rs | Ca, Rs<br>Bi, Ccb<br>Pf, Cb<br>Rs<br>Ore, Rs | Ca, Cg<br>Bi, Cs<br>Ore, Rs | Ca, Rs<br>Ore, Rs | Ca, Rs<br>Pf, Cb<br>Rs<br>Ore, Rs | Ca, Cg<br>Bi, At<br>Cpc<br>Bi, Cs<br>Ore, Rs | Ca, Cg<br>Bi, Ccb<br>Ph, Cb<br>Rs<br>Ore, Rs |
| Primary                                       |   |  |                         |  |                                    |  |                             |                   |                                   |  |  |
| Secondary                                     |   |  |                         |  |                                    |  |                             |                   |                                   |  |  |
| MICRO RELIEF                                  | S   | S  | -                       | R  | R                                  | R  | S                           | R                 | R                                 | R  | R  |
| MACRO RELIEF                                  | S   | S  | -                       | R  | R                                  | R  | S                           | R                 | R                                 | S  | R  |
| SUMMARY CHARACTERISTICS                       | bs  | bg   | IeE                     | Rb'mvO   | Rb'mvO                             | RbmvO  | bgvO                        | RvO               | RPO                               | RbmvO  | RPhmvO                                       |
| OIL RESIDENCE INDEX                           | 1-2   | 2  | 1-2                     | 3  | 3                                  | 3  | 3                           | 3                 | 3                                 | 3  | 3  |
| GROUND TRUTH                                  | 2   | 0  | 0                       | 2,3  | 0                                  | 0  | 3                           | 0                 | 0                                 | 0  | 3  |

## ABBREVIATED PHYSICAL SHORE-ZONE CODING EXPLANATION

This is an abbreviated legend for the physical shore-zone coding sheets; consult the main text for a complete discussion of codes and rationale. Only the across-shore descriptors for morphology and texture are discussed.

ACROSS-SHORE COMPONENTS - dominant morphologic and textural character of each across-shore component, described in a landward to seaward sequence. Each component consists of a geomorphic form descriptor and a substrate descriptor:  
FORM → Bb, Csg + TEXTURE

The primary geomorphic forms are initially described by a series of 12 codes:  
A Anthropogenic E Coastal Bay, Lagoon, Estuary P Platform  
B Beach I Inlet R River  
C Cliff M Marsh S Bar/Trough  
D Dune O Offshore Rocks T Delta

Each of these groups is then further modified by codes as indicated below.

**Anthropogenic (A)**  
e causeway j jetty m marina t trench  
f float g groin r boat ramp s seawall w wharf

**Beach (B)**  
b berm i inclined slope s storm ridge  
c washover channel t multiple intertidal bars t low-tide terrace  
f beach face r single intertidal bar w washover

**Cliff (C)**  
a active or erosional p passive c caves present

**Dune (D)**  
b blowout f foredune s ridge and swale  
d stabilized r random form l longitudinal

**Coastal Bay, Lagoon, Estuary (E)**  
e estuary

**Inlet (I)**  
e ephemeral a opening fixed by offshore structures  
s stable f flood-tidal delta l ebb-tidal delta

**Marsh (M)**  
c tidal creek

**Offshore Rocks (O)**  
e intertidal reef s sea stack  
r rock outcrop (>2 m above M.S.L. and <10 m in width or length)

**Platform (P)**  
h high-tide platform t horizontal t terraced  
l low-tide platform r ramp i irregular

**River (R)**  
b braided m multiple s single channel

**Bar/Trough (S)** subtidal r with rip channels

**Delta (T)**  
c channel m multiple channels p delta plain  
f fan s single channel v crevasse  
l levee

Substrate type or sediment texture are described in detail by a series of codes. The sediments or materials of the shore are initially coded into one of four groups:  
A anthropogenic materials C elastic sediments  
B biogenic sediments R bedrock

Each of these groups is then further modified by texture or composition as indicated below.

**Anthropogenic materials (A)**  
a metal n concrete (solid) w bark or wood debris  
d debris, rubble t logs u wood (structural; e.g., pilings or boards)  
e concrete (individually formed)

**Biogenic sediments (B)**  
l trees or wood particles o organic litter  
s shell hash (with a texture as described below)

**Elastic sediments (C)**  
b boulder s sand m mud  
c cobble # silt g gravel  
p pebble f clay r rubble

**Bedrock (R)**  
i igneous m metamorphic s sedimentary

Where more than one texture is present in an across-shore component, several substrates or textures may be indicated. Where one texture physically overlies another, it is indicated by a slash (e.g., Ca/Rs, and over rock). Where several mutually exclusive textures occur within a component, such as rock outcrops within a sand beach, a colon is used to indicate that association (e.g., Cs:Ri).

Prepared for  
**Minerals Management Service**  
Pacific Outer Continental Shelf Region  
Los Angeles, California

by  
**Woodward-Clyde Consultants**  
Environmental Systems Division  
San Francisco, California

November, 1982

**M.M.S. Map# 129**  
**Sheet 2 of 2**