

NORTHERN CALIFORNIA
ENVIRONMENTAL SENSITIVITY INDEX
METADATA

Prepared By:

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FILE DESCRIBES: Digital data for 1994 Northern California Environmental Sensitivity Index. Data were compiled and digitized at Research Planning, Inc., Columbia, South Carolina.

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COMMENTS: Information was developed using the U.S. Federal Geographic Data Committee's Content Standards for Digital Geospatial Metadata, June 8, 1994. The numbering scheme matches the Meta Data Standard in order to facilitate referencing definitions of the elements. The items in **bold** are required elements and the others are optional elements. The Spatial Data Transfer Standard, ver. 03/92, was referenced to properly identify the geographic entities.

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1.0. IDENTIFICATION INFORMATION

1.1. CITATION

1.1.1. ORIGINATOR:

National Oceanic and Atmospheric Administration (NOAA), Office of Ocean Resources Conservation and Assessment, Seattle, Washington 98115; and Research Planning, Inc., 1121 Park Street, Post Office Box 328, Columbia, South Carolina 29202

1.1.2. PUBLICATION DATE:

199409

1.1.4. TITLE:

Sensitivity of Coastal Environments and Wildlife to Spilled Oil:
Northern California

1.1.5. EDITION:

First

1.1.6. GEOSPATIAL DATA PRESENTATION FORM:

Atlas

1.1.7. SERIES INFORMATION

1.1.7.1. SERIES NAME:

None

1.1.7.2. ISSUE IDENTIFICATION:

Northern California

1.1.8. PUBLICATION INFORMATION

1.1.8.1. PUBLICATION PLACE:

Seattle, Washington

1.1.8.2. PUBLISHER:

NOAA, Office of Ocean Resources Conservation and
Assessment

1.1.9. OTHER CITATION DETAILS:

Prepared by Research Planning, Inc., Columbia, South Carolina for the Hazardous Materials Response and Assessment Division, National Oceanic and Atmospheric Administration, Seattle, Washington and the California Department of Fish and Game, Office of Oil Spill Prevention and Response, Sacramento, California

1.1.10. ONLINE LINKAGE:

Not available

1.1.11. LARGER WORK CITATION:

None

1.2. DESCRIPTION

1.2.1. ABSTRACT:

This data set comprises the Environmental Sensitivity Index (ESI) maps for the shoreline of northern California. ESI data characterize coastal environments and wildlife by their sensitivity to spilled oil. The ESI data include information for three main components: shoreline habitats; sensitive biological resources; and human-use resources

1.2.2. PURPOSE:

The ESI data were collected, mapped, and digitized to provide environmental data for oil spill planning and response. The Clean Water Act with amendments by the Oil Pollution Act of 1990 requires response plans for immediate and effective protection of sensitive resources

1.3. TIME PERIOD OF CONTENT

1.3.1. TIME PERIOD INFORMATION

1.3.1.3. RANGE OF DATES/TIMES:

The intertidal habitats were mapped during aerial and ground surveys conducted from 20-26 October 1992. The biological and human use resources data were compiled by regional biologists in 1994. The dates for these data vary and are documented in Section 2.5.1

1.4. STATUS

1.4.1. PROGRESS:

Complete

1.4.2. MAINTENANCE AND UPDATE FREQUENCY:

None planned

1.5. SPATIAL DOMAIN

1.5.1. BOUNDING COORDINATES

1.5.1.1. WEST BOUNDING COORDINATE:

124.5°

1.5.1.2. EAST BOUNDING COORDINATE:

122.71°

1.5.1.3. NORTH BOUNDING COORDINATE:

42.00°

1.5.1.4. SOUTH BOUNDING COORDINATE:

38.00°

1.6 KEYWORDS

1.6.1. THEME

1.6.1.1. THEME KEYWORD THESAURUS:

None

1.6.1.2. THEME KEYWORD:

Sensitivity maps; ESI; coastal resources; oil spill planning; and coastal zone management

1.6.2. PLACE

1.6.2.1. THESAURUS:

None

1.6.2.2. PLACE KEYWORD:

Northern California: from the California/Oregon border to Point Reyes

1.7. ACCESS CONSTRAINTS:

None

1.8. USE CONSTRAINTS:

DO NOT USE ESI MAPS FOR NAVIGATIONAL PURPOSES.

Besides the above warning, there are no use constraints on this data.

Acknowledgment of NOAA and other contributing sources would be appreciated in products derived from these data.

1.11. DATA SET CREDIT:

This project was supported jointly by NOAA's Hazardous Materials Response and Assessment Division, Robert Pavia, Project Manager, and the Office of Oil Spill Prevention and Response (OSPR), Don Lollock, Program Manager. James Morris, Scientific Support Coordinator from NOAA, assisted with many aspects of the logistical arrangements and participated in the field surveys. Don Lollock, Dale Watkins, and Mel Odemar of OSPR's management staff made critical arrangements and participated in some of the field surveys.

All of the biological data included on these maps were provided by John Tarpley, Jim Hardwick, Joe Lesh, Melissa Boggs, and Heidi Togstad of the California Department of Fish and Game (CDF&G). They, in turn, collected the information from numerous people throughout the state of California. The data collection effort was coordinated by Randy Imai of CDF&G.

At Research Planning, Inc. (RPI), Jeffrey Dahlin was the project biologist and Joanne Halls was responsible for the organization of the data and automation of the maps. Shoreline mapping was conducted by Jacqueline Michel and Miles O. Hayes. James Olsen, Scott Johnson, William Holton, Mark White, Lee Diveley, and Nilish Shiroff entered the data and produced the final maps.

1.13. NATIVE DATA SET ENVIRONMENT:

The software packages used to develop the atlas are Environmental Systems Research Institute's Arc/Info (version 7.0 pre-release) and Oracle RDBMS (version 6.0.36.1.1). The hardware configuration is Hewlett Packard workstations (models 715/50 and 712/80 with 4 X-terminals) with unix operating system (HP-UX Release A.09.01). The following files are included in the data set: birds.e00, esi.e00, fish.e00, hydro.e00, index.e00, mammals.e00, nests.e00, plants.e00, shellfish.e00, socecon.e00, biores.dat.e00, experts.dat.e00, seasonality.dat.e00, socecon.dat.e00, and species.dat.e00. The entire data set is approximately 47 megabytes.

1.14. CROSS REFERENCE:

The Northern and Central California coasts were previously mapped for the Minerals Management Service (Pacific Outer Continental Shelf Region, Los Angeles), by Woodward-Clyde Consultants, (Environmental Systems Division, San Francisco) in November, 1982

2.0. DATA QUALITY INFORMATION

2.1. ATTRIBUTE ACCURACY

2.1.1. ATTRIBUTE ACCURACY REPORT:

The attribute accuracy is estimated to be “good” given the years of ESI experience, the data input methodology, the quality control review sessions, and the digital logical consistency checks.

2.2. LOGICAL CONSISTENCY REPORT:

The digitization of shoreline types, biological resources, and human-use resources is a complex and highly quality-controlled process. In order to facilitate digitizing, the entire study area is split into individual quadrangles using the INDEX coverage. The first layer of information digitized is the ESI shoreline. Upon completion of digitization the data are checked for completeness and topological and logical consistency and then plotted and checked by the mapping geologists. Any errors in the shoreline classification are updated prior to digitization of the biological and socio-economic layers. All layers use the shoreline as the geographic reference so that there are no slivers in the geographic coordinates. The hardcopy biological information is compiled onto 1:24,000 USGS topographic quadrangles by a biological expert using data from regional specialists in the form of maps, tables, charts, and written descriptions of wildlife distributions. The data are digitized, checked using both digital and on-screen procedures, plotted, and sent out for review by the regional specialists. The edited maps are updated, checked once again, and the final product plotted (at approximately 1:50,000 scale). A team of specialists review the entire series of maps, check all data, and make final edits. The data are then merged to form the study-wide layers. The data merging includes a final quality control check where labels, chains, and polygons are checked for attribute accuracy.

To finalize the data checking process, each coverage is checked using a standardized form by two GIS personnel (a technician and the GIS manager), and each attribute database is checked using several programs which test the files for missing or duplicate data, rules for proper coding, GIS topological consistencies (such as dangles, unnecessary nodes, etc.), and Oracle to Arc/INFO consistencies. A final review is made by the GIS manager and programs are run to generate the unique IDs and associated lookup tables.

2.3. COMPLETENESS REPORT:

Shoreline Habitat Mapping:

Prediction of the behavior and persistence of oil on intertidal habitats is based on an understanding of the dynamics of the coastal environments, not just the substrate type and grain size. The vulnerability of a particular intertidal habitat is an integration of the following factors:

- 1) Shoreline type (substrate, grain size, tidal elevation, origin)
- 2) Exposure to wave and tidal energy
- 3) Biological productivity and sensitivity
- 4) Ease of cleanup

All of these factors are used to determine the relative sensitivity of intertidal habitats. Key to the sensitivity ranking is an understanding of the relationships between: physical processes; substrate; shoreline type; product type; fate and effect; and sediment transport patterns. The intensity of energy expended upon a shoreline by wave action, tidal currents, and river currents directly affects the persistence of stranded oil. The need for shoreline cleanup activities is determined, in part, by the slowness of natural processes in removal of oil stranded on the shoreline.

These concepts have been used in the development of the Environmental Sensitivity Index (ESI), which ranks shoreline environments as to their relative sensitivity to oil spills, potential biological injury, and ease of cleanup. Generally speaking, areas exposed to high levels of physical energy, such as wave action and tidal currents, and low biological activity rank low on the scale, whereas sheltered areas with associated high biological activity have the highest ranking.

Sensitive Biological Resources:

Regional biologists compiled the biological data. These data denote the key biological resources that are most likely at risk in the event of an oil spill. Six major categories, or elements, of biological resources were considered during data compilation: birds, fish, shellfish, mammals, plants, and reptiles.

Each ELEMENT corresponds to a coverage or geographic theme. There are four attribute tables, BIORES.DAT, SEASONALITY.DAT, SPECIES.DAT, and EXPERTS.DAT, that are used to store the complex biological data (Fig. 1). Each biological coverage (BIRDS, FISH, MAMMALS, NESTS, PLANTS, REPTILES,

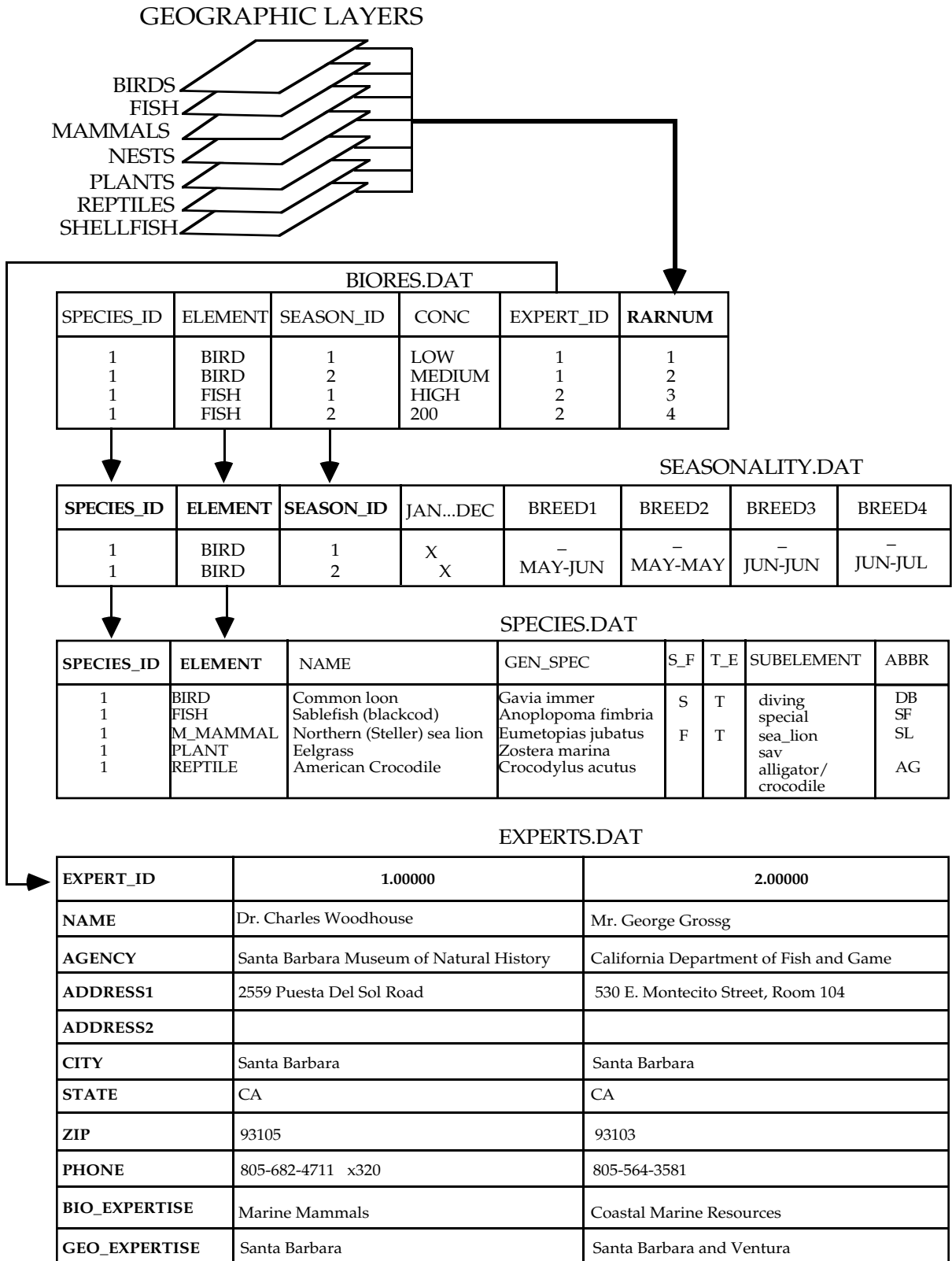


FIGURE 1. Relationships between biology coverages and attribute files.

and SHELLFISH) is linked to the Biological Resources table (BIORES.DAT) using the item RARNUM. The value of RARNUM is determined for each unique combination of SPECIES_ID, SEASON_ID, and CONC. The items in BIORES.DAT are: RARNUM, SPECIES_ID, CONC, SEASON_ID, EXPERT_ID, and ELEMENT. SPECIES_ID is the numeric identifier of each species and is unique within each ELEMENT. CONC is the concentration of the species and can be LOW, MEDIUM or HIGH or an actual count of the numbers of species present in the polygon. SEASON_ID contains a numeric value according to the monthly presence of the species. Usually, there is one seasonality per species, but occasionally the same species has different monthly presence or breeding activity. When this occurs, a new record with a different seasonality is referenced.

The SEASONALITY.DAT table stores the monthly presence of each species and the characteristics of the presence (life history information). The BIORES.DAT table is linked to the SEASONALITY.DAT table using the SPECIES_ID, ELEMENT, and SEASON_ID items. The categories of the variables BREED1 through BREED4 for each ELEMENT are:

ELEMENT	BREED 1	BREED 2	BREED 3	BREED 4
BIRD	nesting	laying	hatching	fledging
FISH	spawning	juvenile	outmigration	
MAMMAL	calving	pupping	molting	
REPTILE	nesting	hatching		
SHELLFISH	spawning	juvenile		

NOTE: There are no BREED variables for PLANTS.

The SPECIES.DAT table contains the common name (NAME), the scientific name (GEN_SPEC), the state and federal status (S_F), and the threatened or endangered status (T_E). The items SUBELEMENT and ABBR refer to the grouping of the species and the associated abbreviation. The SUBELEMENTS, by ELEMENT, are:

ELEMENT	SUBELEMENT	ABBR
Bird	Alcid	AL
	Diving Coastal Bird	DB
	Gull/Tern	GT
	Passerine	PS
	Pelagic	PB
	Raptor	RP
	Shorebird	SB
	Wading Bird	WB
	Waterfowl	WF
Fish	Anadromous	AN
	Beach Spawner	BS
	Kelp Spawner	KS
	Reef Fish	RF
	Special Concentration	SF
Marine Mammal	Dolphin	DL
	Manatee	MN
	Sea Lion	SL
	Sea Otter	OT
	Seal	SE
	Whale	WH
Plant	Marsh	MH
	Submerged aquatic vegetation	
	Shrub	
Reptile	Alligator/Crocodile	AG
	Sea Turtle	TR
Shellfish	Abalone	AB
	Cephalopod	SQ
	Clam	CL
	Conch/Whelk	WK
	Echinoderm	EC
	Gastropod	WK
	Mussel	MS
	Oyster	OY
	Scallop	SC
	Squid/Octopus	SQ
	Crab	CB
	Lobster	LB
	Shrimp	SH
Terrestrial Mammal	Bear	BR
	Deer	DR
	Mustelid	MS
	Rodent	RD

There is also an EXPERTS.DAT table which contains a list of experts who may be contacted during an oil spill. BIORES.DAT and EXPERTS.DAT are linked using the item EXPERT_ID.

Human Use Resources:

Several human use, or socio-economic, features are included in ESI atlases. Entity points and complete chains are digitized into the coverage SOCECON. The data set is linked to the database SOCECON.DAT using the item RARNUM.

ENTITY POINTS (.PAT)		COMPLETE CHAINS (.AAT)	
Item	Type	Item	Type
SOCECON	C	SOCECON	C
RARNUM	C		

The SOCECON item may contain the following values:

Entity Points		Complete Chains	
Feature	SOCECON	Feature	SOCECON
Access	A2	Indian Reservation	IR
Airport	A	International Border	IB
Aquaculture	AQ	Marine Sanctuary	MS
Archaeological Sites	AS	National Park	NP
Beach	B	Park	P
Boat Ramp	BR	Pipeline	PL
Campground	CP	Regional or State Park	SP
Coast Guard	CG	State Border	SB
Commercial Fishing	FA	State Beach	B/RB
Factory	F2	Wildlife Refuge	WR
Fishery Area	FA		
Historical Site	HS		
Hoist	H		
Log Storage	LS		
Marina	M		
Marine Sanctuary	MS		
Mining	M2		
National Park	NP		
Oil Facilities	OF		
Platforms	PF		
Public Fishing	PF		
Recreational Beach	RB		
Recreational Fishing	RF/PF		
State Park	SP		
Subsistence	S		
Village	V		
Water Intake	WI		
Wildlife Refuge	WR		

The table SOCECON.DAT contains the feature type, contact person, the owner of the facility, phone number, and any comments regarding the site. The

RARNUM value is distinguished from the biology RARNUM values by an “H” preceding the unique number.

2.4. POSITIONAL ACCURACY

2.4.1. HORIZONTAL POSITIONAL ACCURACY

2.4.1.1. HORIZONTAL POSITIONAL ACCURACY REPORT:

The ESI data uses USGS 1:24,000 topographic quadrangles as the base map. It is estimated that the ESI has a minimum mapping unit of 50 feet. The biological data sets are developed primarily using regional experts who estimate concentration areas. Unlike shorelines, which maintain relative spatial stability through time, the biological data by nature migrate across the landscape. Therefore, the 1:24,000 USGS quadrangles are used as a base map in gathering the data but the data have “fuzzy” boundaries which must be understood when utilizing this information.

2.5. LINEAGE

2.5.1. SOURCE INFORMATION:

Coverage or theme name: BIRDS

2.5.1.1. SOURCE CITATION

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
David Church, Lisa Burns, and Rich Murphy, San Luis Obispo Dept. of Planning and Building	1992	Coastal Resources Inventory, Biological Resource Distributions	Digital, Hardcopy map, Book	Unknown	Varies	Unknown
UC Davis, Dan Anderson, 916/752-3576	1990	Brown Pelican Roosting Areas	Digital, Point	None	Unknown	Unknown
Eric Kauffman, State of California, State Land Commission	1993	Seabird Colonies of the California Coast	Digital, Entity Points	None	24,000	1989-1990

NORTHERN CALIFORNIA META DATA

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
California Department of Fish and Game	1980	Atlas of California Coastal Marine Resources	Map	Unknown	24,000	1970's
Ecological Consulting, Inc. M.L. Bonnell	1992	Mendocino County-Atlas of Living Marine Resources	Map	Unknown	125,000	1971-1987
Arthur Sowls, Anthony DeGange, Jay Nelson, and Gary Lester	1980	Catalog of California Seabird Colonies	Digital, Entity Points Provided by Calif. State Land Comm., Ted Fukushima (contact), 916-322-7813	Bureau of Land Management, U.S. Fish and Wildlife Service, Report No. FWS/OBS-80/7	24,000	Unknown
U.S. Fish and Wildlife Service	1993	Western Snowy Plover Distribution	Map	Unknown	24,000	Unknown
A.D. Beccasio, J.S. Isakson, A.E. Redfield, Dames & Moore	1981	Pacific Coast Ecological Inventory - San Luis Obispo, California	Map, a report accompanies the map series	Biological Services Program, USFWS, Slidell, La. Report No. FWS/OBS-81/30, 159 pp.	250,000	1921-1981
H.R. Carter <i>et al.</i>	1992	Breeding Populations of Seabirds on the Northern California Coast	Book	U.S. Fish and Wildlife Service, Point Reyes Bird Observatory, and Minerals Management Office	None	1989-1991
S.W. Harris	1991	North-western California Birds, Vol. II, Part 2	Book	Unknown	None	1940-1987

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
BLM and U.S. Fish and Wildlife Service, prepared by Jones and Stokes Assoc., Sacramento, Calif.	1981	An Ecological Characterization of the Central and Northern California Coastal Region	Book	Unknown	None	Unknown
Morro Coast Audubon Society, Inc.	1985	The Birds of San Luis Obispo County, California	Book	Unknown	None	Unknown
Center for Marine Studies	1983	Marine Mammals and Seabirds of Central and Northern California	Book	Study prepared for MMS	None	1980-1983
William S. Leet, Christopher Dewees, and Charles Haugen	1992	California Living Marine Resources and Their Utilization	Book	Unknown	None	Unknown
California Department of Fish and Game, Natural Heritage Division	1993	State and Federal Endangered and Threatened Animals of California	Book	Unknown	None	1993
David Zeiner	1990	California's Wildlife: Vol. 2. Birds	Book	Unknown	None	1980's
Sarah Allen, National Park Service	None	Natural History Information on the State of California	Personal Knowledge	None	None	1994
Paul Kelly, California Department of Fish and Game - Office of Oil Spill Prevention and Response	None	Natural History Information on Seabirds, Shorebirds, and Waterfowl	Personal Knowledge	None	None	1994

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2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
Terry Palmisno, California Department of Fish and Game	None	Inlands, Wetlands, and Riprarian	Personal Knowledge	None	None	1994
Tom Eddell, Morro Coast Audubon Society, 805/995-1691	None	Birds of San Luis Obispo County, Distributions and Densities	Personal Knowledge	None	None	1994
Bruce Elliott, California Department of Fish and Game, Wildlife Division, 408/649-2890	None	Locations of Bird Rookeries & Sensitive Nesting Sites	Personal Knowledge	None	None	1994

2.5.1. SOURCE INFORMATION:

Coverage or theme name: FISH

2.5.1.1. SOURCE CITATION

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
David Church, Lisa Burns, and Rich Murphy, San Luis Obispo Department of Planning and Building	1992	Coastal Resources Inventory, Biological Resource Distributions	Digital map, Hard-copy map, book	Unknown	Varies	Unknown
Bob Tasto, California Department of Fish and Game—Environmental Services Division	1977	Environmental Impacts on Herring, Bivalves, and Commercial Fisheries	Map	California Coastal Commission	24,000	Unknown
California Department of Fish and Game	1980	Atlas of California Coastal Marine Resources	Map	Unknown	24,000	1970's

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
Ecological Consulting, Inc. M.L. Bonnell	1992	Mendocino County–Atlas of Living Marine Resources	Map	Unknown	125,000	1971-1987
A.D. Beccasio, J.S. Isakson, and A.E. Redfield, Dames & Moore	1981	Pacific Coast Ecological Inventory - San Luis Obispo, California	Map, a report accompanies the map series	Biological Services Program, USFWS Slidell, La. Report No. FWS/OBS-81/30, 159 pp.	250,000	1921-1981
W.S. Leet, C.M. Dewees, and C.W. Haugen (Eds.)	1992	California’s Living Marine Resources and Their Utilization	Book	Unknown	None	Unknown
BLM and U.S. Fish and Wildlife Service, prepared by Jones and Stokes Assoc., Sacramento, Calif.	1981	An Ecological Characterization of the Central and Northern California Coastal Region	Book	Unknown	None	Unknown
Robert G. Titus, Report to California Department of Fish and Game	1992	Status of California Steelhead in Coastal Drainages South of San Francisco Bay	Book	Unknown	None	1991
Peter Moyle, Jack Williams, and Eric Wikramanayake	1989	Fish Species of Special Concern of California	Book	Unknown	None	Unknown
William S. Leet, Christopher Dewees, and Charles Haugen	1992	California Living Marine Resources and Their Utilization	Book	Unknown	None	Unknown

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2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
California Department of Fish and Game, Natural Heritage Division	1993	State and Federal Endangered and Threatened Animals of California	Book	Unknown	None	Unknown
R.L. Emmett, S.L. Stone, S.A. Hintor, and M.E. Monaco	1991	Distribution and Abundance of Fishes and Invertebrates in West Coast Estuaries - Volume II: Species Life History Summaries	Book	ELMR Rep. No. 8, NOAA/NOS Strategic Environmental Assessments Division, Rockville, Md., 329 pp.	None	Info compiled from historical and current literature and expert personal comm. and knowledge
Diane Watters, California Department of Fish and Game	None	Status and Location in San Francisco Bay of Herring	Personal Knowledge	None	None	1994
Bill Cox, California Department of Fish and Game—Inland Fisheries Division	None	Distribution, Abundance, Species, and Activity of Streams	Personal Knowledge	None	None	1994
Ken Oda, California Department of Fish and Game—Marine Resource Division	None	Distribution and Abundance of Smelt and Herring	Personal Knowledge	None	None	1994
Jim Hardwick, California Department of Fish and Game—Office of Oil Spill Prevention and Response	None	Squid, Herring, and Rockfish	Personal Knowledge	None	None	1994

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
Weldon Jones, California Department of Fish and Game—Inland Fisheries Division	None	Distribution, Abundance, Species, and Activity of Streams	Personal Knowledge	None	None	1994
Tom Moore, California Department of Fish and Game—Marine Resources Division, 707/875-2521	None	Abundance and Distribution of Herring	Personal Knowledge	None	None	1994
Dave Thomas, California Department of Fish and Game	None	Status and Life History of Rockfish	Personal Knowledge	None	None	1994
Sandy Owen, California Department of Fish and Game	None	Fisheries, Local Knowledge	Personal Knowledge	None	None	1994
Bob Hardy, California Department of Fish and Game, 805/772-3011	None	Fisheries and Marine Resources in San Luis Obispo Co.	Personal Knowledge	None	None	1994
Susan McBride, California Sea Grant, 707/443-8369	None	Locations of Commercial Species	Personal Knowledge	None	None	1994
Karen Worcester, Regional Water Quality Control Board, 805/549-3333	None	Fishes (esp. tidewater goby) Within San Luis Obispo Co. Creeks and Morro Bay	Personal Knowledge	None	None	1994
David Ven Tresca, California Department of Fish and Game, Marine Resources Division, 408/649-2881	None	Marine Fisheries, Rockfishes	Personal Knowledge	None	None	1994

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
Jennifer Nelson, California Department of Fish and Game, Fisheries Division, 408/649-7153	None	Spawning Streams for Steelhead Trout and Salmon spp.	Personal Knowledge	None	None	1994

2.5.1. SOURCE INFORMATION:

Coverage or theme name: MAMMALS

2.5.1.1. SOURCE CITATION

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
David Church, Lisa Burns, and Rich Murphy, San Luis Obispo Dept. of Planning and Building	1992	Coastal Resources Inventory, Biological Resource Distributions	Digital map, Hard-copy map, book	Unknown	Varies	Unknown
UC Davis, Dan Anderson, 916/752-3576	1991	Sea Otter Sightings by Aerial Survey	Digital, Point	None	Unknown	1990
California Department of Fish and Game	1980	Atlas of California Coastal Marine Resources	Map	Unknown	24,000	1970's
Ecological Consulting, Inc., M.L. Bonnell	1992	Mendocino County-Atlas of Living Marine Resources	Map	Unknown	125,000	1971-1987
A.D. Beccasio, J.S. Isakson, and A.E. Redfield, Dames & Moore	1981	Pacific Coast Ecological Inventory - San Luis Obispo, California	Map, a report accompanies the map series	Biological Services Program, USFWS Slidell, La., Report No. FWS/OBS-81/30, 159 pp.	250,000	Data for map series compiled from many sources 1921-1981

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
Center for Marine Studies	1983	Marine Mammals and Seabirds of Central and Northern California	Book	Study prepared for MMS	None	1980-1983
William S. Leet, Christopher Dewees, and Charles Haugen	1992	California Living Marine Resources and Their Utilization	Book	Unknown	None	Unknown
David Zeiner	1990	California's Wildlife: Vol. 3. Mammals	Book	Unknown	None	1980's
Doyle Hanan, California Department of Fish and Game—Marine Resources Division	None	Distribution, Life History, and Abundance of Harbor Seals and Pinnipeds	Personal Knowledge	None	None	1994
Jack Ames, California Department of Fish and Game—Office of Oil Spill Prevention and Response, 408/649-2893	None	Distribution, Abundance, and Life History of Sea Otters	Personal Knowledge	None	None	1994
Terry Palmisno, California Department of Fish and Game	None	Inland, Wetlands, and Riparian	Personal Knowledge	None	None	1994
Dr. Aryan Roest, California Polytechnic State University, 805/528-4404	None	Marine Mammals—Distribution Within San Luis Obispo County	Personal Knowledge	None	None	1994

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
Brian Hatfield, U.S. Fish and Wildlife Service, 805/927-3893	None	Sea Otters, Elephant Seals and Other Marine Mammal Densities and Distributions	Personal Knowledge	None	None	1994
Fred Wendell, California Department of Fish and Game, 805/772-1714	None	Sea Otters	Personal Knowledge	None	None	1994

2.5.1. SOURCE INFORMATION:

Coverage or theme name: PLANTS

2.5.1.1. SOURCE CITATION

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
David Church, Lisa Burns, and Rich Murphy, San Luis Obispo Dept. Planning and Building	1992	Coastal Resources Inventory, Biological Resource Distributions	Digital map, Hard-copy map, book	Unknown	Varies	Unknown
A.D. Beccasio, J.S. Isakson, and A.E. Redfield, Dames & Moore	1981	Pacific Coast Ecological Inventory - San Luis Obispo, California	Map, a report accompanies the map series	Biological Services Program, USFWS Slidell, La., Report No. FWS/OBS-81/30, 159 pp.	250,000	Data for map series compiled from many sources 1921-1981
William S. Leet, Christopher Dewees, and Charles Haugen	1992	California Living Marine Resources and Their Utilization	Book	Unknown	None	Unknown

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
Tom Moore, California Department of Fish and Game—Marine Resources Division	None	Abundance and Distribution of Eelgrass	Personal Knowledge	None	None	1994
Deborah Hillyard, California Department of Fish and Game	None	Species and Location in Monterey County and Santa Cruz Counties	Personal Knowledge	None	None	1994

2.5.1. SOURCE INFORMATION:

Coverage or theme name: SHELLFISH

2.5.1.1. SOURCE CITATION

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
David Church, Lisa Burns, and Rich Murphy, San Luis Obispo Dept. Planning and Building	1992	Coastal Resources Inventory, Biological Resource Distributions	Digital, Hardcopy map, book	Unknown	Varies	Unknown
California Dept. of Fish and Game	1980	Atlas of California Coastal Marine Resources	Map	Unknown	24,000	1970's
Ecological Consulting, Inc., M.L. Bonnell	1992	Mendocino County—Atlas of Living Marine Resources	Map	Unknown	125,000	1971-1987

NORTHERN CALIFORNIA META DATA

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
A.D. Beccasio, J.S. Isakson, and A.E. Redfield, Dames & Moore	1981	Pacific Coast Ecological Inventory - San Luis Obispo, California	Map, a report accompanies the map series	Biological Services Program, USFWS Slidell, La., Report No. FWS/OBS-81/30, 159 pp.	250,000	Data for map series compiled from many sources 1921-1981
BLM and U.S. FWS, prepared by Jones and Stokes Assoc., Sacramento, Calif.	1981	An Ecological Characterization of the Central and Northern California Coastal Region	Book	Unknown	None	Unknown
William S. Leet, Christopher Dewees, and Charles Haugen	1992	California Living Marine Resources and Their Utilization	Book	Unknown	None	Unknown
R.L. Emmett, S.L. Stone, S.A. Hintor, and M.E. Monaco	1991	Distribution and Abundance of Fishes and Invertebrates in West Coast Estuaries - Volume II: Species Life History Summaries	Book	ELMR Rept. No. 8, NOAA/NOS Strategic Environmental Assessments Division, Rockville, Md., 329 pp.	None	Info compiled from the historical and current literature and expert personal comm. and knowledge
Tom Moore, California Department of Fish and Game—Marine Resources Division	None	Abundance and Distribution of Bivalves	Personal Knowledge	None	None	1994
Frank Henry, California Department of Fish and Game	None	Gastropods and Echinoderms	Personal Knowledge	None	None	1994

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
Sandy Owen, California Department of Fish and Game, 805/772-3011	None	Pismo Clams	Personal Knowledge	None	None	1994
Jerry Spratt, California Department of Fish and Game, Marine Division, 408/649-2880	None	Bivalves, Gastropods, and Marine Invertebrates	Personal Knowledge	None	None	1994
Deborah Hillyard, California Department of Fish and Game	Unknown	Species and Location in Monterey County and Santa Cruz County	Personal Knowledge	None	None	1994
Susan McBride, California Sea Grant, 707/443-8369	None	Commercial Fisheries, Locations by Species	Personal Knowledge	None	None	1994

2.5.1. SOURCE INFORMATION:

Coverage or theme name: SOCECON

2.5.1.1. SOURCE CITATION

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
Bob Tasto, California Department of Fish and Game—Environmental Services Division	1977	Environmental Impacts on Herring, Bivalves, and Commercial Fisheries	Map	Unknown	24,000	Unknown
State Water Resources Control Board	1976	Areas of Special Biological Significance	Map	Unknown	2-5" = 1 mile	Unknown

NORTHERN CALIFORNIA META DATA

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
Emil Smith and Thom Johnson	1974	The Marine Life Refuges and Reserves of California	Map	Unknown	1" = 2 miles	Unknown
California Coastal Commission	1987	California Coastal Resource Guide	Book	Unknown	None	1980's
California Coastal Commission	1991	California Coastal Access Guide	Book	unknown	None	1980's
Rob Collins, California Department of Fish and Game—Marine Resources Division	1993	State Aquaculture Leases	Book	Unknown	None	Unknown
Karen Worcester, Regional Water Quality Control Board, 805/549-3333	None	Fisheries Within San Luis Obispo creeks & Morro Bay	Personal Knowledge	None	None	1994
Bob Hardy, California Department of Fish and Game, 805/772-3011	None	Fisheries and Marine Resources in San Luis Obispo Co.	Personal Knowledge	None	None	1994
Mickey Burke, Tribal Member, 707/487-7055	None	Location and Species of Native American and Subsistence Fishing Areas	Personal Knowledge	None	None	1994
Ted Kuipen, Kuipen Mariculture, 707/822-9057	None	Locations Off-the-ground Culture of Commercial Oyster Aquaculture	Personal Knowledge	None	None	1994
Susan McBride, California Sea Grant, 707/443-8369	None	Commercial Fisheries, Locations by Species	Personal Knowledge	None	None	1994

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
Craig Codd, Coast Oyster, 707/442-2974	None	Locations On-the-ground Culture of Commercial Oyster Aquaculture	Personal Knowledge	None	None	1994
David Ven Tresca, California Department of Fish and Game,- Marine Resources Division, 408/649-2881	None	Marine Fisheries and Resources, Locations of Ecological Reserves	Personal Knowledge	None	None	1994
Jerry Spratt, CDF&G, Marine Division, 408/649-2880	None	Centers of Sport, Commercial, and Commercial Sport Fishing Activity	Personal Knowledge	None	None	1994

2.5.2. PROCESS STEP

2.5.2.1. PROCESS DESCRIPTION:

The digitization of ESI, biological resources, and human-use resources is a complex and highly quality controlled process. In order to facilitate digitizing, the entire study area was split into individual quadrangles using a map index coverage. The first layer of information digitized is the ESI. Upon completion of digitization the data is checked for completeness, topological and logical consistency and then plotted and checked by the over-flight/field specialists. Any errors in the shoreline classification are updated prior to digitization of the biological and socio-economic layers. All data use the shoreline as the geographic reference so that there are no slivers in the geographic layers. The biological information is compiled onto 1:24,000 USGS topographic quadrangles by an in-house biological and GIS expert using the data from regional specialists in the form of maps, tables, charts, and written

descriptions of wildlife distributions. The data are digitized, checked using both digital and on-screen procedures, plotted, and sent out for review by the regional specialists. The edited maps are updated on the computer, checked once again, and plotted at final map scale. A team of specialists review the entire series of maps, check all data, and make final edits. The data are merged to form the study-wide layers which are described in this document. The data merging includes a final quality control check where topological consistency, rules for geography, and database to geography are checked and reported to the GIS manager.

2.5.2.3. PROCESS DATE:

199409

2.5.2.6. PROCESS CONTACT

2.5.2.6.1. CONTACT PERSON PRIMARY

2.5.2.6.1.1. CONTACT PERSON:

Joanne Halls

2.5.2.6.1.2. CONTACT ORGANIZATION:

Research Planning, Inc.

2.5.2.6.3. CONTACT POSITION:

Director, GIS Department

2.5.2.6.4. CONTACT ADDRESS

2.5.2.6.4.1. ADDRESS TYPE:

Physical Address

2.5.2.6.4.2. ADDRESS:

1121 Park Street

2.5.2.6.4.3. CITY:

Columbia

2.5.2.6.4.4. STATE OR PROVINCE:

SC

2.5.2.6.4.5. POSTAL CODE:

29201

2.5.2.6.5. CONTACT VOICE TELEPHONE:

(803) 256-7322

2.5.2.6.7. CONTACT FACSIMILE TELEPHONE:

(803) 254-6445

2.5.2.6.8. CONTACT ELECTRONIC MAIL ADDRESS:

jhalls@researchplanning.com

3.0. SPATIAL DATA ORGANIZATION INFORMATION**3.2. DIRECT SPATIAL REFERENCE METHOD:**

Vector

3.3. POINT AND VECTOR OBJECT INFORMATION**3.3.1. SDTS TERMS DESCRIPTION:****3.3.1.1. SDTS POINT AND VECTOR OBJECT TYPE, and****3.3.1.2. POINT AND VECTOR OBJECT COUNT:**

Theme	Universe Polygon	GT-Polygons	Area Points	Complete Chains	Line Segments	Label Points	Entity Points	Nodes
BIRDS	1	172	172	493	95,943			386
ESI	1	547	547	3,919	136,013			3,759
FISH	1	1,955	1,955	2,104	74,414			2,051
HYDRO	1	7,234	7,234	9,248	329,303			8,835
INDEX	1	39	39	172	176			134
MAMMALS	1	251	251	464	83,915			416
NESTS							127	
PLANTS	1	3,430	3,430	3,622	113,094			3,566
SHELLFISH	1	4,574	4,574	4,826	136,743			4,750
SOCECON				103	2,187		275	1,549

4.0. SPATIAL REFERENCE INFORMATION

4.1. HORIZONTAL COORDINATE SYSTEM DEFINITION

4.1.2. PLANAR

4.1.2.1. MAP PROJECTION

4.1.2.1.1. MAP PROJECTION NAME:

ALBERS CONICAL EQUAL AREA

4.1.2.1.1.2. MAP PROJECTION PARAMETERS :

1st STANDARD PARALLEL:

34.0

2nd STANDARD PARALLEL:

40.5

**LONGITUDE OF CENTRAL
MERIDIAN:**

120.0

LATITUDE OF PROJECTION ORIGIN:

0

FALSE EASTING:

0

FALSE NORTHING:

-4,000,000

4.1.2.4. PLANAR COORDINATE INFORMATION

4.1.2.4.1. PLANAR COORDINATE ENCODING METHOD:

Coordinate Pair

4.1.2.4.2. COORDINATE REPRESENTATION:

4.1.2.4.2.1. ABSCISSA RESOLUTION:

50 feet

4.1.2.4.2.2. ORDINATE RESOLUTION:

50 feet

4.1.4. GEODETIC MODEL

4.1.4.1. HORIZONTAL DATUM NAME:

North American Datum of 1927

4.1.4.2. ELLIPSOID NAME:

Clarke, 1866

4.1.4.3. SEMI-MAJOR AXIS:

6,378,206.4

4.1.4.4. DENOMINATOR OF FLATTENING RATIO:

294.98

5.0. ENTITY AND ATTRIBUTE INFORMATION

5.1. DETAILED DESCRIPTION: BIRDS

The coverage BIRD contains the polygons with bird species.

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:
<u>GT-Polygons</u>	ID integer

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

ID

5.1.2.2. ATTRIBUTE DEFINITION:

A unique identifier which links to the POLYS.LUT table. The POLYS.LUT is a lookup table with two attributes: ID and RARNUM. The value of RARNUM is determined for each unique combination of SPECIES_ID, SEASON_ID, and CONC. The items in BIORES.DAT are: RARNUM, SPECIES_ID, CONC, SEASON_ID, EXPERT_ID, and ELEMENT. SPECIES_ID is the numeric identifier of each species and is unique within each ELEMENT. CONC is the concentration of the species and can be LOW, MEDIUM, or HIGH or an actual count of the numbers of species present in the polygon. SEASON_ID contains a numeric value according to the monthly presence of the species. Usually, there is one seasonality per species, but occasionally the same species has different monthly presence or breeding activity. When this occurs, a new record with a different seasonality is referenced.

The following BIRD species are found in the central California ESI atlas:

SPECIES ID	NAME
1	Common loon
4	Red-necked grebe
5	Horned grebe
6	Eared grebe
7	Western grebe

SPECIES ID	NAME
8	Double-crested cormorant
9	Brandt's cormorant
10	Pelagic cormorant
11	Whistling swan (tundra swan)
12	Canada goose
13	Black brant
20	Northern shoveler
21	Canvasback
22	Greater scaup
28	Harlequin duck
29	White-winged scoter
30	Surf scoter
33	Red-breasted merganser
37	Western gull
46	Common murre
47	Pigeon guillemot
48	Marbled murrelet
49	Cassin's auklet
50	Rhinoceros auklet
51	Tufted puffin
53	Northern phalarope
54	Great blue heron
64	Short-billed dowitcher
67	Sanderling
68	Black oystercatcher
76	Bald eagle
77	Osprey
88	Great egret
90	Black-crowned night heron
96	Leach's storm-petrel
102	Fork-tailed storm-petrel
107	Peregrine falcon
118	Brown pelican
139	Snowy plover
141	American avocet
144	Ashy storm-petrel
150	Black rail
155	Willet
160	Red phalarope
173	White pelican
179	Pied-billed grebe
185	American bittern
187	Virginia rail
188	Sora rail
197	Black scoter (common)
200	Sooty shearwater
206	California black rail
210	Marbled godwit

SPECIES ID	NAME
215	Aleutian goose
1,001	Gulls
1,002	Shorebirds
1,003	Waterfowl
1,004	Wading birds
1,005	Raptors
1,006	Diving birds
1,008	Terns

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE

DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

integer

5.1. DETAILED DESCRIPTION: ESI

The Coverage ESI contains polygonal (GT-Polygons) and arc (Complete Chains) features for the ESI shoreline classification. The classification of the features is based upon *Guidelines for Developing Digital Environmental Sensitivity Index Atlases and Data-bases* (Michel, J. and J. Dahlin, 1993, Hazardous Materials Response and Assessment Division, NOAA). The ESI classification was performed 20-26 October 1992.

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:
<u>Complete Chain</u>	ESI SOURCE_ID character integer
<u>GT-Polygons</u>	ESI WATER_CODE character character

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

ESI

5.1.2.2. ATTRIBUTE DEFINITION:

The item ESI contains values according to the ESI ranking of the shorelines and polygons. The ESI rankings progress from low to high susceptibility to oil spills. The central California shoreline types are listed below. In many cases, the shorelines are also ranked with multiple codes such as 10/7. The first number is the most landward shoreline type, salt marsh, with exposed tidal flats being the shoreline type closest to the water.

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:	5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:
1A	Exposed Rocky Cliffs
1A/2	Exposed Rocky Cliffs/Wave Cut Rocky Platforms
1A/3	Exposed Rocky Cliffs/Fine- to Medium-Grained Sand Beaches
1B	Exposed Seawall
1C	Exposed Rocky Cliffs/Boulder Talus Base
2	Wave Cut Rocky Platforms
2/3	Wave Cut Rocky Platforms/Fine- to Medium-Grained Sand Beaches
2/5	Wave Cut Rocky Platforms/Mixed Sand and Gravel Beaches
3	Fine- to Medium-Grained Sand Beaches
3/2	Fine- to Medium-Grained Sand Beaches/Wave Cut Rocky Platforms
3/6A	Fine- to Medium-Grained Sand Beaches/Gravel Beaches
3/7	Fine- to Medium-Grained Sand Beaches/Exposed Tidal Flats
3/8A	Fine- to Medium-Grained Sand Beaches/Sheltered Rocky Shores
3/9	Fine- to Medium-Grained Sand Beaches/Sheltered Tidal Flats
4	Coarse-Grained Sand to Granule Beaches
4/2	Coarse-Grained Sand to Granule Beaches/Wave Cut Rocky Platforms
4/9	Coarse-Grained Sand to Granule Beaches/Sheltered Tidal Flats
5	Mixed Sand and Gravel Beaches
5/10	Mixed Sand and Gravel Beaches/Salt Marsh
5/2	Mixed Sand and Gravel Beaches/Wave Cut Rocky Platforms
5/3	Mixed Sand and Gravel Beaches/Fine- to Medium-Grained Sand Beaches
5/7	Mixed Sand and Gravel Beaches/Exposed Tidal Flats
5/8A	Mixed Sand and Gravel Beaches/Sheltered Rocky Shores
5/8A/9	Mixed Sand and Gravel Beaches/Sheltered Rocky Shores/Sheltered Tidal Flats
5/9	Mixed Sand and Gravel Beaches/Sheltered Tidal Flats
6A	Gravel Beaches
6A/2	Gravel Beaches/Wave Cut Rocky Platforms
6A/3	Gravel Beaches/Fine- to Medium-Grained Sand Beaches
6A/7	Gravel Beaches/Exposed Tidal Flats
6A/9	Gravel Beaches/Sheltered Tidal Flats
6B	Riprap
6B/10	Riprap/Salt Marsh
6B/2	Riprap/Wave Cut Rocky Platforms

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:	5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:
6B/3 6B/3/7	Riprap/Fine- to Medium-Grained Sand Beaches Riprap/Fine- to Medium-Grained Sand Beaches/Exposed Tidal Flats
6B/9 7	Riprap/Sheltered Tidal Flats Exposed Tidal Flats
7/3	Exposed Tidal Flats/Fine- to Medium-Grained Sand Beaches
8A	Sheltered Rocky Shores
8A/3	Sheltered Rocky Shores/Fine- to Medium-Grained Sand Beaches
8A/5	Sheltered Rocky Shores/Mixed Sand and Gravel Beaches
8A/6A	Sheltered Rocky Shores/Gravel Beaches
8A/7	Sheltered Rocky Shores/Exposed Tidal Flats
8A/9	Sheltered Rocky Shores/Sheltered Tidal Flats
8B	Sheltered Man-Made Structures
8B/7	Sheltered Man-Made Structures/Exposed Tidal Flats
8B/9	Sheltered Man-Made Structures/Sheltered Tidal Flats
9	Sheltered Tidal Flats
9/10	Sheltered Tidal Flats/Salt Marshes
10	Salt Marsh
10/7	Salt Marsh/Exposed Tidal Flats
10/9	Salt Marsh/Sheltered Tidal Flats

**5.1.2.4.1.3. ENUMERATED DOMAIN VALUE
DEFINITION SOURCE:**

Research Planning, Inc.

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

Ordered

5.1.2.1. ATTRIBUTE LABEL:

SOURCE_ID

5.1.2.2. ATTRIBUTE DEFINITION:

Data source for the ESI

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:	5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:
0	Digital

**5.1.2.4.1.3. ENUMERATED DOMAIN VALUE
DEFINITION SOURCE:**

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

nominal

5.1.2.1. ATTRIBUTE LABEL:

WATER_CODE

5.1.2.2. ATTRIBUTE DEFINITION:

Specifies a polygon as either water or land

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

**5.1.2.4.1.1. ENUMERATED
DOMAIN VALUE:**

**5.1.2.4.1.2. ENUMERATED DOMAIN
VALUE DEFINITION:**

W L	Water Land
--------	---------------

**5.1.2.4.1.3. ENUMERATED DOMAIN VALUE
DEFINITION SOURCE:**

Research Planning, Inc.

5.1. DETAILED DESCRIPTION: FISH

The coverage FISH contains the polygons with fish species.

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:
<u>GT-Polygons</u>	ID integer

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

ID

5.1.2.2. ATTRIBUTE DEFINITION:

A unique identifier which links to the POLYS.LUT table. The POLYS.LUT is a lookup table with two attributes: ID and RARNUM. The value of RARNUM is determined for each unique combination of SPECIES_ID, SEASON_ID, and CONC. The items in BIORES.DAT are: RARNUM, SPECIES_ID, CONC, SEASON_ID, EXPERT_ID, and ELEMENT. SPECIES_ID is the numeric identifier of each species and is unique within each ELEMENT. CONC is the concentration of the species and may be LOW, MEDIUM, or HIGH. SEASON_ID contains a numeric value according to the monthly presence of the species. Usually, there is one seasonality per species, but occasionally the same species has different monthly presence or breeding activity. When this occurs, a new record with a different seasonality is referenced.

The following FISH species are found in the central California ESI atlas:

SPECIES ID	NAME
43	White sturgeon
44	Green sturgeon
45	Cutthroat trout
54	Redtail surfperch
66	Pacific herring
68	Chinook salmon (king)
69	Coho salmon (silver)
74	Rainbow trout (steelhead)

SPECIES ID	NAME
75	Surf smelt
77	Eulachon
83	Salmon sp.
104	Striped bass
219	Pacific lamprey
223	Rockfish
224	Surfperch
225	California halibut
226	Tidewater goby
228	Night smelt

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE

DEFINITION SOURCE:

Research Planning, Inc.

5.1. DETAILED DESCRIPTION: HYDRO

The Coverage HYDRO contains polygonal water and land features as well as linear features for rivers/streams that are tidally influenced. This coverage was created using the digital shoreline provided by the California State Land Office.

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:	
<u>Complete Chains</u>	LINE	character
<u>GT-Polygons</u>	WATER_CODE	character

The LINE, SOURCE_ID, and WATER_CODE attributes are the same as in the ESI coverage. This coverage contains all annotation used in producing the atlas. The annotation features are categorized into three subclasses in order to simplify the mapping and quality control procedures: geog or geographic features, soc or socio-economic features and hydro or water features.

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

WATER_CODE

5.1.2.2. ATTRIBUTE DEFINITION:

Specifies a polygon as either water or land

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:

5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:

W	Water
L	Land

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

Ordered

5.1.2.1. ATTRIBUTE LABEL:

LINE

5.1.2.2. ATTRIBUTE DEFINITION:

Type of geographic feature

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

**5.1.2.4.1.1. ENUMERATED
DOMAIN VALUE:**

**5.1.2.4.1.2. ENUMERATED DOMAIN
VALUE DEFINITION:**

I	Index for map/quad boundary
S	Shoreline

**5.1.2.4.1.3. ENUMERATED DOMAIN VALUE
DEFINITION SOURCE:**

Research Planning, Inc.

5.1. DETAILED DESCRIPTION: INDEX

The coverage INDEX contains the map boundaries for each quad/map in the atlas.

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:
<u>GT-Polygons</u>	TILE-NAME character
	TOPO-NAME character
	SCALE integer
	MAPANGLE fraction
	PAGESIZE character

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

TILE-NAME

5.1.2.2. ATTRIBUTE DEFINITION:

The tile-name contains the map number according to the specified layout of the atlas. During the map production process the value of tile-name is plotted on the map product to order the maps in a coherent manner. The values for each polygon are unique and range from 1 through 41.

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

Ordered

5.1.2.1. ATTRIBUTE LABEL:

TOPO-NAME

5.1.2.2. ATTRIBUTE DEFINITION:

USGS 1:24,000 topographic map name. Some polygons straddle two or more maps and all map names are included in this attribute. The date (latest/revised) of the USGS maps are also included in this field.

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

Research Planning, Inc.

ARCATA NORTH, CALIF. (1972); TYEE CITY, CALIF. (1972)
ARCATA SOUTH, CALIF. (1972)
ARCHED ROCK, CALIF. (1977); FORT ROSS, CALIF. (1978)
BEAR HARBOR, CALIF. (1969)
BODEGA HEAD, CALIF. (1972)
CANNIBAL ISLAND, CALIF. (1972)
CAPETOWN, CALIF. (1969); CAPE MENDOCINO, CALIF. (1969)
CHILDS HILL, CALIF. (1975); SISTER ROCKS, CALIF. (1966)
COOSKIE CREEK, CALIF. (1969)
CRANNELL, CALIF. (1975); TRINIDAD, CALIF. (1978)
CRESCENT CITY CALIF. (1978)
DRAKES BAY, CALIF. (1976)
DUNCANS MILL, CALIF. (1979)
ELK, CALIF. (1960); ALBION, CALIF. (1960)
EUREKA, CALIF. (1972)
FERN CANYON, CALIF. (1966)
FERNDALE, CALIF. (1972)
FIELDS LANDING, CALIF. (1972)
FORT BRAGG, CALIF. (1978)
HALES GROVE, CALIF. (1970); MISTAKE POINT, CALIF. (1969)
INGLENOOK, CALIF. (1976)
INVERNESS, CALIF. (1976); POINT REYES NE, CALIF. (1976)
MALLO PASS CREEK, CALIF. (1977)
MENDOCINO, CALIF. (1978)
ORICK, CALIF. (1975)
PETROLIA, CALIF. (1969)
PLANTATION, CALIF. (1977)
POINT ARENA, CALIF. (1978)
REQUA, CALIF. (1966)
SAUNDERS REEF, CALIF. (1977)
SHELTER COVE, CALIF. (1969)
SHUBRICK PEAK, CALIF. (1969)
SMITH RIVER, CALIF.-OREGON (1966)
STEWARTS POINT, CALIF. (1978)
STEWARTS POINT, CALIF. (1978); GUALALA, CALIF. (1977)
TOMALES, CALIF. (1976)
TRINIDAD, CALIF. (1978); RODGERS PEAK, CALIF. (1966)
VALLEY FORD, CALIF. (1971)
WESTPORT, CALIF. (1977)

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

Nominal

5.1.2.1. ATTRIBUTE LABEL:

SCALE

5.1.2.2. ATTRIBUTE DEFINITION:

SCALE contains the value of the denominator of the scale at which the INDEX polygon is plotted in the final map product.

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:

46,500

50,000

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE

DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

Nominal

5.1.2.1. ATTRIBUTE LABEL:

MAPANGLE

5.1.2.2. ATTRIBUTE DEFINITION:

MAPANGLE contains a value (usually negative) to rotate the final map product so that it is situated straight up and down.

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:

-0.10

0.00

0.10

0.15

0.30

0.35

0.43

0.45

0.47

0.50

0.57

0.65

0.70

0.75

0.80

0.83

0.85

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE

DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

Nominal

5.1.2.1. ATTRIBUTE LABEL:

PAGESIZE

5.1.2.2. ATTRIBUTE DEFINITION:

PAGESIZE contains the value of the width and height of the map in the final map product.

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:

11,17

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE

DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

Nominal

5.1. DETAILED DESCRIPTION: MAMMALS

The coverage MAMMAL contains the polygons with mammal species.

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:
<u>GT-Polygons</u>	ID integer

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

ID

5.1.2.2. ATTRIBUTE DEFINITION:

A unique identifier which links to the POLYS.LUT table. The POLYS.LUT is a lookup table with two attributes: ID and RARNUM. The value of RARNUM is determined for each unique combination of SPECIES_ID, SEASON_ID, and CONC. The items in BIORES.DAT are: RARNUM, SPECIES_ID, CONC, SEASON_ID, EXPERT_ID, and ELEMENT. SPECIES_ID is the numeric identifier of each species and is unique within each ELEMENT. CONC is the concentration of the species and can be LOW, MEDIUM, or HIGH or an actual count of the numbers of species present in the polygon. SEASON_ID contains a numeric value according to the monthly presence of the species. Usually, there is one seasonality per species, but occasionally the same species has different monthly presence or breeding activity. When this occurs, a new record with a different seasonality is referenced.

The following MAMMAL species are found in the central California ESI atlas:

SPECIES ID	NAME
1	Northern (Steller) sea lion
2	Harbor seal
6	Harbor porpoise
12	Minke whale
22	California sea lion
24	Northern elephant seal

SPECIES ID	NAME
26	Gray whale
47	Dall's porpoise
48	Sperm whale

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE

DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

integer

5.1. DETAILED DESCRIPTION: NESTS

The coverage NEST contains entity points representing nesting sites.

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:
<u>GT-Polygons</u>	ID integer

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

ID

5.1.2.2. ATTRIBUTE DEFINITION:

A unique identifier which links to the POLYS.LUT table. The POLYS.LUT is a lookup table with two attributes: ID and RARNUM. The value of RARNUM is determined for each unique combination of SPECIES_ID, SEASON_ID, and CONC. The items in BIORES.DAT are: RARNUM, SPECIES_ID, CONC, SEASON_ID, EXPERT_ID, and ELEMENT. SPECIES_ID is the numeric identifier of each species and is unique within each ELEMENT. CONC is the concentration of the species and can be LOW, MEDIUM, or HIGH or an actual count of the numbers of species present in the polygon. SEASON_ID contains a numeric value according to the monthly presence of the species. Usually, there is one seasonality per species, but occasionally the same species has different monthly presence or breeding activity. When this occurs, a new record with a different seasonality is referenced.

The following NESTS are found in the central California ESI atlas:

SPECIES ID	NAME
8	Double-crested cormorant
9	Brandt's cormorant
10	Pelagic cormorant
37	Western gull
46	Common murre
47	Pigeon guillemot
49	Cassin's auklet
50	Rhinoceros auklet

SPECIES ID	NAME
51	Tufted puffin
68	Black oystercatcher
96	Leach's storm-petrel
102	Fork-tailed storm-petrel
144	Ashy storm-petrel

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE

DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

integer

5.1. DETAILED DESCRIPTION: PLANTS

The coverage PLANT contains the polygons with plant species.

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:
<u>GT-Polygons</u>	ID integer

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

ID

5.1.2.2. ATTRIBUTE DEFINITION:

A unique identifier which links to the POLYS.LUT table. The POLYS.LUT is a lookup table with two attributes: ID and RARNUM. The value of RARNUM is determined for each unique combination of SPECIES_ID, SEASON_ID, and CONC. The items in BIORES.DAT are: RARNUM, SPECIES_ID, CONC, SEASON_ID, EXPERT_ID, and ELEMENT. SPECIES_ID is the numeric identifier of each species and is unique within each ELEMENT. CONC is the concentration of the species and may be LOW, MEDIUM, or HIGH. SEASON_ID contains a numeric value according to the monthly presence of the species. Usually, there is one seasonality per species, but occasionally the same species has different monthly presence or breeding activity. When this occurs, a new record with a different seasonality is referenced.

The following PLANT species are found in the central California ESI atlas:

SPECIES ID	NAME
1	Eelgrass
2	Bull kelp
3	Menzies wallflower
4	Beach layia
5	Salt marsh bird's-beak
6	Western lily
8	Clover lupine

SPECIES ID	NAME
9	Giant kelp
69	Marin bent grass
71	Howells spineflower

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE

DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

integer

5.1. DETAILED DESCRIPTION: SHELLFISH

The coverage SHELLFISH contains the polygons with shellfish species.

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:
<u>GT-Polygons</u>	ID integer

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

ID

5.1.2.2. ATTRIBUTE DEFINITION:

A unique identifier which links to the POLYS.LUT table. The POLYS.LUT is a lookup table with two attributes: ID and RARNUM. The value of RARNUM is determined for each unique combination of SPECIES_ID, SEASON_ID, and CONC. The items in BIORES.DAT are: RARNUM, SPECIES_ID, CONC, SEASON_ID, EXPERT_ID, and ELEMENT. SPECIES_ID is the numeric identifier of each species and is unique within each ELEMENT. CONC is the concentration of the species and can be LOW, MEDIUM, or HIGH. SEASON_ID contains a numeric value according to the monthly presence of the species. Usually, there is one seasonality per species, but occasionally the same species has different monthly presence or breeding activity. When this occurs, a new record with a different seasonality is referenced.

The following SHELLFISH species are found in the central California ESI atlas:

SPECIES ID	NAME
14	Dungeness crab
21	Washington butter clam
24	Gaper clam
25	Soft-shell clam
28	Pacific razor clam
29	Common Pacific littleneck clam
38	Native Pacific oyster
60	Abalone
69	Bay ghost shrimp
70	Purple shore crab

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

**5.1.2.4.1.3. ENUMERATED DOMAIN VALUE
DEFINITION SOURCE:**

Research Planning, Inc.

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

integer

5.1. DETAILED DESCRIPTION: SOCECON

The coverage SOCECON contains the entity points and complete chains for the human use data.

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:	
<u>Complete Chain</u>	SOCECON	
<u>Entity Points</u>	SOCECON	character
	ID	character

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

ID

5.1.2.2. ATTRIBUTE DEFINITION:

A unique identifier which links to the POINTS.LUT table. POINTS.LUT is a lookup table with two attributes: ID and RARNUM. RARNUM is the link to the socio-economic data found in the SOCECON.DAT table. The table SOCECON.DAT contains feature type, contact person, owner of the facility, phone number, and any comments regarding the site. The RARNUM value is distinguished from the biology RARNUM values by an "H" preceding the unique number.

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

integer

5.1.2.1. ATTRIBUTE LABEL:

SOCECON

5.1.2.2. ATTRIBUTE DEFINITION:

Identifies a line or point with a socio-economic, or human-use, feature. This attribute allows direct access to the type of feature instead of linking to the more detailed SOCECON.DAT table.

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

Research Planning, Inc.

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE: 5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:

A	Airport
A2	Access
AQ	Aquaculture
AS	Archaeological Site
B	Beach
BR	Boat Ramp
CG	Coast Guard
FA	Fishery Area
H	Hoist
HS	Historical Site
IR	Indian Reservation
M	Marina
MS	Marine Sanctuary
NP	National Park
P	Park
PF	Public Fishing
RB	Recreational Beach
RP	Regional Park
S	Subsistence
V	Village
WI	Water Intake
WR	Wildlife Refuge

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

nominal

6.0. DISTRIBUTION INFORMATION**6.1. DISTRIBUTOR****6.1.1. CONTACT PERSON PRIMARY****6.1.1.1. CONTACT PERSON:**

Robert Pavia

6.1.1.2. CONTACT ORGANIZATION:

NOAA

6.1.4. CONTACT ADDRESS**6.1.4.1. ADDRESS TYPE:**

Physical Address

6.1.4.2. ADDRESS:

7600 Sand Point Way N.E., Bin C15700

6.1.4.3. CITY:

Seattle

6.1.4.4. STATE OR PROVINCE:

WA

6.1.4.5. POSTAL CODE:

98115

6.1.5. CONTACT VOICE TELEPHONE:

(206) 526-6319

6.1.7. CONTACT FACSIMILE TELEPHONE:

(206) 526-6329

6.2. RESOURCE DESCRIPTION:

ESI Atlas for Northern California

6.3. DISTRIBUTION LIABILITY:

Although this data has been processed successfully on a computer system at the National Oceanic and Atmospheric Administration, no warranty, expressed or implied, is made by NOAA regarding the utility of the data on any other system, nor shall the act of distribution constitute any such warranty. NOAA warrants the delivery of this product in computer-readable format, and will offer a replacement copy of the product when the product is determined unreadable by computer input peripherals, or when the physical medium is delivered in damaged condition.

6.5. CUSTOM ORDER PROCESS

Contact NOAA for distribution options (see 6.1.1.).

7.0. METADATA REFERENCE INFORMATION

7.1. METADATA DATE:

19941206

7.2. METADATA REVIEW DATE:

19941115

7.4. METADATA CONTACT

7.4.1. CONTACT PERSON PRIMARY

7.4.1.1. CONTACT PERSON:

Joanne Halls

7.4.1.2. CONTACT ORGANIZATION:

Research Planning, Inc.

7.4.3. CONTACT POSITION:

Director, GIS Dept.

7.4.4. CONTACT ADDRESS

7.4.4.1. ADDRESS TYPE:

Physical Address

7.4.4.2. ADDRESS:

1121 Park Street

7.4.4.3. CITY:

Columbia

7.4.4.4. STATE OR PROVINCE:

South Carolina

7.4.4.5. POSTAL CODE:

29201

7.4.5. CONTACT VOICE TELEPHONE:

(803) 256-7322

7.4.7. CONTACT FACSIMILE TELEPHONE:

(803) 254-6445

7.4.8. CONTACT ELECTRONIC MAIL ADDRESS:

jhalls@researchplanning.com

7.5. METADATA STANDARD NAME:

Content Standards for Digital Geospatial Metadata

7.6. METADATA STANDARD VERSION:

19940608

