CALFED BAY DELTA PROGRAM
TIER 1 EIS/EIR
AFFECTED ENVIRONMENT/EXISTING CONDITIONS
DRAFT WORK PLAN

Section 1. Purpose of the Work Plan for Existing Conditions

The purposes of this Existing Conditions Work Plan are to:

- present a definition of "Existing Conditions",
- develop criteria for selecting resource conditions to be described and the historical period to considered for each issue area, and
- identify the data needs and process to be followed in collecting the data.

These issues are addressed in the remaining portions of this report.

Section 2. Definition of Existing Conditions/Selection Criteria

DEFINITION OF EXISTING CONDITIONS

The National Environmental Policy Act (NEPA) requires that an environmental impact study (EIS) describe the environment of the area to be affected or created by the alternatives under consideration. The affected environment discussion should be no longer than necessary to understand the impacts of the proposed actions and alternatives, should be commensurate in detail with importance of the impacts, and should avoid useless information and verbose descriptions (40 CFR 1502.15).

The California Environmental Quality Act (CEQA) requires that an environmental impact report (EIR) describe the environment in the project vicinity, from local and regional perspectives, as it exists before commencement of the project. Similar in guidance to NEPA, the description of existing conditions under CEQA will be no longer than is necessary to understand the significant effects of the proposed project and its alternatives.

The existing conditions or affected environment will be a description of the existing physical, biological, economic and social conditions and not a projection of future conditions without implementation of the CALFED Bay-Delta Program. The No-Action Alternative will represent this future baseline and is described in a separate report. Additionally, the existing conditions will provide a historical perspective of issues that have influenced present conditions. For example, a description of existing conditions of water quality within the Bay-Delta region will contain a brief synopsis of historical land use practices that have influenced existing water quality.

SELECTION OF ISSUE AREAS

For the EIS/EIR, guidance is available for selecting which issue areas should be considered in a description of the existing conditions. The sources include NEPA, CEQA, U.S. Bureau of Reclamation, and the U.S. Fish and Wildlife Service's handbooks on NEPA compliance and scoping meetings. Guidelines from these written sources are consistent: focus on the issues that will be affected by the proposed action and alternatives. From this direction, a single, comprehensive criterion has been developed. All issues raised in scoping or other forums will be screened with respect to this criterion:

Issue Area Criterion: Will the Issue Area Be Affected by an Alternative Being Considered in the EIS/EIR?

Because CALFED Bay-Delta Program alternatives are yet to be fully defined, the issue areas that are being addressed in the CVPIA PEIS were used as a starting point (a comprehensive list of issue areas is available in CVPIA PEIS); the screening criterion was applied to this list. Table 1 presents the results of and rationale for this screening. As the alternatives evolve and the final selection of alternatives is known, it is proposed that the screening criterion be applied again to perhaps narrow (or expand) the range of topics to be addressed in the CALFED Bay-Delta Program EIS/EIR. Additionally, scoping is likely to reveal other topics that will need to be considered in the EIS/EIR.

SELECTION OF THE HISTORICAL PE RIOD

The purpose of the historical period is to provide the reader with a general sense of the reasons for a particular issue area being in its current condition and to provide a premise for forecasting future conditions and impacts under the No-Action Alternative. The CVPIA PEIS includes a discussion of changes to resources during a historical period. The historical period varies for each resource topic and was ultimately selected based on the availability of data. We are proposing to use the historical periods established for the CVPIA PEIS resource topics for the CALFED Bay-Delta Program EIS/EIR. After the alternatives for the CALFED Bay- Delta Program EIS/EIR are determined, more or less detail may be required.

SELECTION OF THE STUDY AREA AND FOCUS OF THIS WORK PLAN

A description of the CALFED Bay-Delta Program was prepared (January 17, 1996) that discusses the geographic scope of the problems and the solutions. This paper states that the geographic scope of the CALFED Bay-Delta Program will consist of the legally defined Delta, Suisun Bay and Suisun Marsh and that the scope of the solutions may encompass any action that can be implemented by CALFED agencies, or can be influenced by them, to address the identified problems, regardless of whether its implementation takes place within the Delta/Suisun Bay/Suisun Marsh area. To facilitate data collection efforts, the boundary will need to be defined in more detail. The study area for the existing conditions/affected environment must include all areas that will be affected by implementation of the CALFED Bay-Delta Program. Thus, one comprehensive criterion is adequate.

Study Area Criterion. What Geographic Area Will Be Affected by Implementation of the CALFED Bay-Delta Program?

At this time (March 1996), several unknowns exist with respect to the alternatives that will be evaluated in the EIS/EIR; therefore, it is impossible to absolutely define the geographic study area of the affected environment. However, because the Delta/Suisun Bay/Suisun Marsh will be the focus of any proposed solution, it is proposed that the focus of this work plan will be the Delta/Suisun Bay/Suisun Marsh. Further, it is proposed that information from the CVPIA Programmatic EIS for the areas outside of the Delta will be incorporated into the CALFED Bay-Delta Program EIS/EIR; updating the CVPIA PEIS affected environment section would be done at the time of actual preparation of the EIS/EIR, when alternatives and range and type of environmental impacts are more definitive. In summary, this approach is both efficient and appropriate in light of the focus of the CALFED Bay-Delta Program, the status of alternatives development, and the existence of technical reports for the affected environment under CVPIA. The above screening criterion will be reviewed again after the alternatives are developed.

Table 1. Screening Criteria for Resource Topics for the CALFED Bay-Delta Program Tier 1 EIS/EIR

Resource Category	Resource Topic	Specific Issues[a]	Potentially Affected by Program Alternative	Potential Changes to Resources Located within the Bay-Delta System	Modification of Information Contained in CVPIA PEIS Technical Appendices
Physical	**Geology and Soils**	Soil erosion	Yes	Yes	Yes
		Subsidence (of Delta lands)	Yes	Yes	Yes
		Soil salinity and Soil contamination (drainage is included in "Groundwater" below)	Yes	No	No
		River channel processes	Yes	No	No
		Levee stability and system integrity	Yes	Yes	Yes
	Water/Hydrology	Streamflow changes	Yes	No	No
		Reservoir storage level changes	Yes	No	No
		Bay and Delta inflow/outflow changes	Yes	Yes	Yes
		Surface drains	Yes	No	No
		Groundwater availability	Yes	No	No
	Water/Hydraulics	Streams/Delta depths/velocities current forces	Yes	Yes	Yes
	Surface-Water Quality	Streams	Yes	No	No
		Reservoirs	Yes	No	No
		Bay and Delta	Yes	Yes	Yes
	Aquatic Ecology/ Fisheries				
	Rivers and Tributaries	Changes in anadromous fish populations; effects on resident fish populations Habitat quality	Yes	No	No

Table 1. Continued

Resource Category	Resource Topic	Specific Issues[a]	Potentially Affected by Program Alternative	Potential Changes to Resources Located within the Bay-Delta System	Modification of Information Contained in CVPIA PEIS Technical Appendices
	Reservoirs	Maintenance of freshwater species and sportfish population and supporting forage base	Yes	No	No
	Delta and Bay	Changes in estuarine, anadromous, and marine resident fish populations and their supporting forage base	Yes	Yes	Yes
Biological	**Vegetation**				
	Reservoirs	Riparian habitat Wetland habitat Special-status species	Yes	No	No
	Streams	Riparian habitat Wetland habitat Special-status species Riparian/wetland habitat	Yes	No	No
	Refuges	Riparian habitat Wetland habitat Special-status species	Yes	Yes	Yes
	Delta	Riparian/wetland and other habitat Special-status species	Yes	Yes	Yes
	Wildlife (nonaquatic)				
	Upland/ Agricultural Lands	Upland habitat	Yes	Yes	Yes
	Reservoirs	Special-status species/ resident and migrant populations	Yes	No	No
	Streams	Riparian-dependent species/ Special-status species Resident populations	Yes	No	No
	Refuges	Resident and migrant populations Special-status species	Yes	Yes	Yes

Resource Category	Resource Topic	Specific Issues[a]	Potentially Affected by Program Alternative	Potential Changes to Resources Located within the Bay-Delta System	Modification of Information Contained in CVPIA PEIS Technical Appendices
	Delta	Resident and migrant populations Special-status species	Yes	Yes	Yes
	Upland/ Agricultural Lands	Resident and migrant populations Special-status species	Yes	Yes	Yes
Social	**Land Use**				
	Agricultural Uses	Crop acres	Yes	Yes	Yes
	M&I Uses	Developed acres	Yes	No	No
	Open Space Use	Natural habitat acres	Yes	Yes	Yes
	Recreation				
	Reservoirs	Changes in recreation use	Yes	No	No
	Rivers	Changes in recreation use	Yes	No	No
	Delta	Changes in recreation use	Yes	Yes	Yes
	Refuges	Changes in recreation use	Yes	Yes	Yes
	Coastal	Changes in recreation use	Yes	No	No
	Economics				
	Agriculture	Value of crops, net income, crop acres, irrigation efficiency	Yes	Yes	Yes
	M&I	Avoided costs of obtaining water elsewhere or imposing shortages	Yes	No	No
	Recreation (excluding sportfishing)	Spending Benefits Direct employment Direct income	Yes	No	No
	Sportfishing	Spending Benefits Direct employment Direct income	Yes	Yes	Yes

Table 1. Continued

Resource Category	Resource Topic	Specific Issues[a]	Potentially Affected by Program Alternative	Potential Changes to Resources Located within the Bay-Delta System	Modification of Information Contained in CVPIA PEIS Technical Appendices
	Commercial Fishing	Net income (profit) Direct employment Direct income	Yes	No	No
	Power Production	Avoided costs of obtaining power elsewhere or imposing shortages	Yes	No	No
	Regional	Regional income Regional employment	Yes	No	No
	Aesthetics	Viewsheds	Yes	Yes	Yes
	Cultural Resources	Historic resources Archaeological resources Ethnographic resources Native American Traditional Cultural properties	Yes	Yes	Yes
	Public Health	Vectors	Yes	Yes	Yes
	Power Production,	Power production	Yes	No	No
	Power Use	Power use	Yes	No	No
	Air Quality	Potential increases in particulates, sulfur compounds, and carbon compounds	Yes	Yes	Yes

[a]Specific issues are based on the CALFED Bay-Delta Program Draft Level of Detail Discussion Paper

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Section 3. Preparation of the CALFED Tier 1 EIS/EIR Affected Environment Reports

PROPOSED APPROACH TO DEVELOPING WORK PLANS

The proposed approach to developing the following work plan is based on review of the preliminary project alternatives, review of the CVPIA PEIS technical appendices, and review of Phase I Existing Conditions Report prepared for the CVPIA PEIS (Montgomery Watson 1993). The scope of work for each relevant topic area addressed in the Phase I Existing Conditions Report was reviewed and modified as necessary to refocus the work effort on providing adequate baseline information to conduct the environmental impact analysis for the CALFED Bay-Delta Program existing conditions reports. The primary focus of each work plan is to describe the steps necessary to update and expand CVPIA PEIS technical appendices to provide an adequate description of existing conditions within the Bay-Delta region.

RESOURCE TOPICS WORK PLANS

Physical Resources

Air Quality

Data related to air quality will be collected for the Sacramento, San Joaquin, and Bay Area air basins with a focus on air pollutants and air toxins. Data will be collected by reviewing emissions inventories, data monitoring summary reports, and previous investigations conducted at the air basin level.

The number of pollutant-standard violations over time will be identified. The regulatory environment for air quality in each of the air basins will be summarized. Emissions inventories for municipal, industrial, and agricultural land uses will also be summarized.

Surface Water

In the Delta, the possible effects of pumping, Delta cross channel operation, agricultural diversions and drainage, and Delta outflows on export water quality, salinity intrusion, and

entrapment zone locations and conditions will be described. The hydrography of Delta channels and the effects of tidal flows on transport and mixing will be described.

A summary and general comparison of water quality in major tributaries will be compiled. State and federal water quality regulatory requirements will be reviewed as background for selection of important water quality issues and variables of concern. Current water quality monitoring networks within the Bay-Delta and tributaries will be described. Results from these monitoring stations will be summarized or referenced. Emphasis will be placed on temperature, salinity, and other fish and wildlife habitat condition variables.

Geology and Soils

Data describing geologic and soil conditions of the affected environment will be collected. Maps expected to be produced of the study areas will include active faults, liquefaction potential, and generalized soil types.

Data will be collected primarily from previous investigations conducted by the U.S. Geological Survey, Department of Water Resources (DWR), California Division of Mines and Geology, the California Division of Oil and Gas (DOG), U.S. Bureau of Reclamation, and the U.S. Natural Resources Conservation Service.

Biological Resources

Vegetation and Wildlife

Data on vegetation and wildlife resources contained in the CVPIA PEIS technical appendix will be updated as necessary. Data pertaining to descriptions of native biological communities will be collected. Data pertaining to agricultural habitats will be updated based on information provided by the California Department of Agriculture and County Agricultural Commissioners' Offices.

The status and distribution of special plant and animal species will be updated based on information obtained from the Natural Diversity Data Base, the California Native Plant Society, the interagency Wildlife Habitat Relationships data base, and other existing reports. The description of special-status species will be expanded to include California species of special concern.

The name, legal status, habitat requirements, and distribution of special-status species will be updated. Significant natural areas within the Bay-Delta region will be mapped. Seasonally important waterfowl use areas will be identified and described in figures and tables.

Fisheries

Estuarine and Delta aquatic resources will be the focus of the existing conditions technical appendix. Emphasis will be on the following species and communities: fall-run, late fall-run, winter-run, and spring-run chinook salmon; steelhead trout; white sturgeon; green sturgeon; striped bass; American shad; Delta smelt; longfin smelt; Sacramento splittail; estuarine invertebrate community; and Bay species community.

To complete the existing conditions, new information and information needed to encompass the breadth of potential CALFED actions will be added to the core document, including updated fish life-history information, fish habitat needs, limiting factors, and existing fish recovery plans and management actions. For example, relevant information from recent publications and decisions, such as the December 1995 Draft Anadromous Fish Restoration Plan and the May 1995 Water Quality Control Plan, will be integrated into the CALFED existing conditions. There will be a greater emphasis on ongoing and proposed fisheries restoration actions, particularly on nonflow restoration actions, and ongoing monitoring programs. These restoration and monitoring programs were not nearly as developed during the time that the CVPIA PEIS aquatic resources existing conditions section was being prepared and substantial new information is now available. A comprehensive literature review and agency contact program will not be conducted given the short timeframe expected for developing the existing conditions, our current involvement in a number of relevant programs (such as CVPIA), and the substantial amount of contact already made with key resource agencies.

Social Resources

Fish, Wildlife, and Recreation Economics

Fish, wildlife, and recreation economics will focus on the economic value of these resources and their uses that are supported by water flows in the Delta. These activities and uses primarily include sportfishing, recreational boating, and wildlife viewing. Commercial fishing does not occur within the Delta.

Historical and existing recreation use levels for recreation activities in the Delta will be summarized based on the information presented in the Recreation Affected Environment Report. Data pertaining to spending per user-day for sportfishing, boating, and wildlife viewing will be collected from existing studies. Data concerning total historical and existing recreation-related spending in the Delta will be obtained from existing state and federal government reports. If spending data is not available, it will be estimated based on recreation use levels and spending per user-day estimates.

Existing employment and personal income directly generated by recreation spending in the Delta will be estimated using coefficients derived from a regional economic input-output model such

as IMPLAN. Recreation-related employment and income will be compared with region-wide employment and income levels to identify the relative importance of Delta recreation to the regional economy.

Data pertaining to net benefits of participating in water-dependent recreation in the Delta will be obtained from existing studies of recreation in the Delta or at similar recreation sites.

Agricultural Economics

Data will be collected at the county level to generally describe the agricultural economy of the Bay-Delta region. This data will include crop acreages and value, farm income, and agriculture-related employment. Data regarding crop acreages and value will be collected from County Agricultural Commissioner's Offices. Data regarding farm income and agriculture-related employment will be collected from the California Department of Finance and U.S. Bureau of the Census. This data will include total employment and employment in industries related to agriculture.

Recreation

The description of recreation resources will be on water-related recreation activities occurring within the Bay-Delta region. Data on fishing success reported in the CVPIA existing conditions technical report will be updated. Information regarding waterfowl hunting will be included based on annual hunting-day information available from the California Department of Fish and Game. Information on the location of recreation facilities and types of recreation in the Delta will also be included based on information contained in existing reports. User data will be collected from available sources including the California Department of Parks and Recreation, California Department of Fish and Game, and California Department of Boating and Waterways. This data will be supplemented with a qualitative discussion of the types and locations of recreation activities occurring within the Bay-Delta region.

Land Use

The description of existing land uses within the Bay-Delta region will include agricultural uses, municipal and industrial uses, open space use, and other land uses that could be affected by construction and operation of project alternatives.

The description of agricultural land use data on cropping patterns and acreage within the Bay-Delta region will be based on annual crop and livestock reports compiled by County Agricultural Commissioners. Information on crop acreage will be consolidated into broader categories, including fruit, nut, and vine crops; grain crops; forage crops; vegetable crops; and field and row crops.

The description of open space uses will be based on information collected as part of the agricultural and municipal and industrial land use data collection efforts. This information will be supplemented with information on the location of public open space areas, such as parks and wildlife refuges, available from the California Department of Parks and Recreation and California Department of Fish and Game.

Public Health

The description of public health will focus on describing disease vector populations and status of control of these vectors within the Bay-Delta region. The report will describe the status of mosquito control in the region, mosquito species of concern, mosquito control methods, and current regulatory policies on vector control. The description will include information on the acreage and location of areas treated. Mosquito abatement districts within the Bay-Delta region will be contacted to provide baseline data on the acreage and location of areas treated. Information on other public health concerns will also be addressed in this section including potential for lyme disease, bubonic plague, and rabies.

Data will be collected for current regulatory policies on vector control and pesticide management in the study areas.

Aesthetics

The description of visual resources within the Bay-Delta region will be formulated to assess potential changes in these resources as a result of modification of the landscape from implementation of components of project alternatives (i.e., levee modification, flooding of islands, construction of isolated transfer facilities, etc.). A description of the visual characteristics of the Bay-Delta region will be based on existing reports and data sources.

The visual resources within the Bay-Delta region will be described using a different approach than that used for the CVPIA PEIS. The CVPIA PEIS approach was based on the use of the Visual Management System developed the by U.S. Forest Service. The potential for modification of views within the Bay-Delta region that are associated with project alternatives, and the generalized description of visual resources found in the CVPIA PEIS visual resources technical appendix, suggests that an alternative approach to describing visual resources be used. For the existing conditions reports, visual resources occurring within the Bay-Delta region will be described using the process developed by the Federal Highway Administration. This approach was successfully used for the recently completed Delta Wetlands EIS/EIR.

Cultural Resources

The cultural resources analysis will build on research conducted for the CVPIA PEIS. Information for the CVPIA PEIS concerning resources within the Bay-Delta region study area will be updated and expanded to assess the impacts of the project on cultural resources.

The work effort will consist of conducting a records search at appropriate information centers of the California Historical Resources File System. Information will be gathered at each information center on the number of resources recorded in each county within the study area, and the number of resources listed in the National Register of Historic Places, the California Register of Historical Resources, California State Historical Landmarks, and California Points of Historical Interest. Information will also be gathered regarding the proportion of the study area that has been inventoried for cultural resources. Pertinent reports relevant to the study area will be reviewed to obtain information regarding resources within the region. The goal of this research is to determine the type, location, density, and potential significance of known and predicted prehistoric and historic resources within the study area. Information on known site locations and previous survey coverage will not be collected.

The California Native American Heritage Commission will be consulted regarding information on sacred sites within the study area. This information, coupled with data obtained by researching published ethnographic sources conducted for the CVPIA PEIS, will be used to determine whether the project could affect resources of importance to Native Americans.

Based on this information, an existing condition report will be prepared. The report will include an assessment of the study area's sensitivity for historical and prehistoric resources. This assessment will be based on the area's proximity to resources, distribution of known sites, topographic relief, and other environmental factors that influence prehistoric and historic site locations. The report will provide information on the types, general location, density, and potential significance of known and predicted prehistoric and historic resources within the study area. This information will be presented in textual form. A sensitivity map will not be prepared.

APPLICATION OF GEOGRAPHIC INFORMATION SYSTEM FOR THE CALFED BAY-DELTA TIER 1 EIS/EIR

Appendix A presents an inventory of existing Geographic Information System (GIS) data for the project area that could be relevant for the CALFED EIS/EIR. Geographic data are available for existing habitats, historic habitats, sensitive species occurrences, land use, physical characteristics, cultural resources, and other resource categories. These GIS data layers can be used efficiently for presentations of historic and existing conditions, impact analysis, and mitigation planning. Most available data are managed by agencies that participate in CALFED. In a few cases data were listed that are not currently in a GIS format, but that could be easily implemented in GIS.

EXISTING CONDITIONS REPORTS FORMAT

Review of the CVPIA PEIS existing conditions reports and other environmental documents conducted on projects in the Delta indicate that the volume of data for each resource topic is such that individual resource topic reports may not be necessary or desirable. An alternative to producing individual reports for each resource topic is to combine the topics into related groupings. The reports and resource topic contained in each report would be as follows:

- Physical resources existing conditions report:

  -climate and air quality,
  -geology and soils, and
  -surface water.

- Biological resources existing conditions report:

  -vegetation,
  -wildlife, and
  -fisheries.

- Social resources:

  -land use,
  -economics,
  -recreation,
  -public health,
  -aesthetics, and
  -cultural resources.

Appendix A. Inventory of Geographic Information System Data Sources

Table A - 1. Inventory of Geographic Information System Data Sources with Potential Application for the CALFED Bay-Delta Program Tier 1 EIR/EIS

Data Category	Resource Topic	Organization	Program	Staff contact	Geographic coverage	Data type	Date(s) of record	Nominal mapping scale	Software platform	Comments	On internet?
Habitats											
	Eelgrass beds	California State Lands Commission	NMFS Report		San Francisco Bay	polygon	1992	1:24,000	ARC/INFO		Y
	Shallow water fish habitat	California State Lands Commission			San Francisco/San Pablo/Honker Bays	polygon	1993	1:80,000	ARC/INFO		Y
	Natural communities - Delta	DWR Central District Delta GIS Program	Delta Levees Subventions Program (SB34)	Kent Nelson	Legal Delta	polygon	various	1:24,000	Geo/SQL		N
	Habitat mitigation areas - Delta	DWR Central District Delta GIS Program	Delta Levees Subventions Program (SB34)	Kent Nelson	Legal Delta	polygon/ line	various	1:24,000	Geo/SQL		N
	Levee habitat types - Delta	Harding Lawson Associates	Delta Levees Subventions Program (SB34)		Legal Delta	polygon	1991	1:1,000		privately held, may be available for a fee	N
	Wetlands - Bay/Delta	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	Bay/Delta (by 7.5' quad, incomplete)	raster	1985	1:24,000	GRASS		view only
	Wetlands - North Delta	DWR Delta Planning Branch	North Delta Program	Ray McDowell	North Delta	raster, polygon	1991, 1992	1:9,600	GRASS, ARC/INFO		N
	Bay lands (mudflats, tidal marsh, diked baylands, riparian)	San Francisco Estuary Institute		Ted Daum	Bay / Delta downstream from Broad Slough	polygon	1985 (NWI base)	1:24,000	ARC/INFO		N
	Seasonal wetlands - North Bay	San Francisco Estuary Institute	SF Bay Area Ecosystem Goals Project	Ted Daum	North Bay (Carquinez Straight - San Rafael Bridge)	polygon	1985	1:12,000	ARC/INFO		N
	Wetlands - Yolo Basin	Jones & Stokes Associates	Central Valley Habitat Joint Venture	Bruce Boyd	Yolo Basin	polygon	various	1:24,000	ARC/INFO		N
	Wetlands - Central Valley	DFG	Central Valley Wetland Mapping Project	Kari Lewis	Central Valley	polygon	various	1:100,000			N
	Wetlands - California	USFWS	National Wetland Inventory		California (by 7.5'quad, incomplete	polygon	various	1:24,000	ARC/INFO		Y (DLGs)
	Special-status natural communities	DFG Natural Heritage Division	California Natural Diversity Data Base	Patrick Gaul	California	region, point	various	1:24,000	ARC/INFO	no public distribution	N
	Native vegetation - Stone Lakes Study Area	Bureau of Reclamation	Stone Lakes Wildlife Refuge Feasibility Study	Chuck Johnson	Southwestern Sacramento County	polygon		1:48,000			N
Historic habitats											
	Historic tidal wetlands	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster	1851-1897	1:125,000	GRASS		view only
	Historic vegetation - Yolo Basin	Jones & Stokes Associates	Central Valley Habitat Joint Venture	Bruce Boyd	Yolo Basin	polygon	various	1:24,000	ARC/INFO		N
	Historic riparian habitat - Upper Sacrament River	DWR Northern District	SB 1086	Stacey Cepello	Sacramento River from Verona to Keswick	polygon			Geo/SQL		N
Species habitats											
	American shad habitat	California State Lands Commission			San Pablo/Suisun Bay	polygon	1992	1:80,000	ARC/INFO		Y
	Young chinook salmon habitat	California State Lands Commission			South San Pablo Bay	polygon	1992	1:80,000 and 1:24,000	ARC/INFO		Y
	Potential clapper rail habitat	California State Lands Commission			San Francisco Bay Estuary	polygon	1979	1:24,000	ARC/INFO		Y
Species occurrences											
	Delta special status species	DWR Central District Delta GIS Program	Delta Levees Subventions Program (SB34)	Kent Nelson	Legal Delta	point	various	1:24,000	Geo/SQL		N
	Special-status animal and plant species	DFG Natural Heritage Division	California Natural Diversity Data Base	Patrick Gaul	California	region/ point	various	1:24,000	ARC/INFO	no public distribution	N
	Neomysis - zooplankton (and physical parameters)	DFG (DWR)	IESP	Lee Mecum	San Pablo Bay - Delta (San Pablo Bay - Hood - Stockton)	points	1972 - present	N/A (50 points)	currently not in GIS, can be implemented		N
	Salmon smolts and juveniles (and physical parameters)	USFWS (DFG)	IESP	Pat Brandes/ Spencer Hovekamp	Delta - Sacramento River (Benicia - Princeton - Mossdale)	points	1991 - present (portions started in 1978)	N/A (40 points)	currently not in GIS, can be implemented		N
	Striped bass (eggs, larvae, adults)	DFG	IESP	Lee Miller	San Pablo Bay - Delta (San Pablo Bay - Rio Vista - Stockton)	points	1959 (summer adults) 1968 (eggs, larvae) 1967 (winter adults) - present	N/A (147 - 190 points)	currently not in GIS, can be implemented		N

Table A-1. Continued

	Delta smelt	DFG, DWR, UC DAVIS, USFWS, USBR	IESP	Geir Aasen, Dale	San Pablo Bay - Delta (San Pablo Bay - Knights Landing - Tracy, Byron)	points	1992 - present (portions from 1959)	N/A (174 points)	portions in GIS		N
	Fish and crustaceans	DFG	IESP (Delta Outflow/San Francisco Bay Study)	Kathy Hieb	Bay - Delta (South Bay - Threemile Slough - Antioch Bridge)	points	1980 - present	N/A (85 points)	currently not in GIS, can be implemented		N
	Entrainment of eggs, larvae and fish (+ physical parameters)	DFG, DWR	IESP (Delta Entrainment and Delta Agricultural Diversion Evaluation)	Stephani Spaar	Delta	points	1985 - present	N/A (12 points)	currently not in GIS, can be implemented		N
Land use											
	Delta Canal Service Areas	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster	1987	1:100,000	GRASS		view only
	County General Plans	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster	1980-1990	1:100,000	GRASS		view only
	Farmland (according to importance)	Department of Conservation	Farmland Mapping and Monitoring Program	Greg Posely	Bay and Delta Counties and most of the Central Valley	polygon	1992, preliminary 1994 data may be available in Spring	1:24,000	Intergraph		N
	Crop types - Delta	DWR Statewide Planning	Crop Mapping Program	Tom Hawkins	Legal Delta	polygon	1991	1:24,000	Geo/SQL		N
	Crop types - Central Valley	DWR Statewide Planning	Crop Mapping Program	Tom Hawkins	Most of Central Valley by county	polygon	Solano Co. 1994, Yolo Co. 1989, Sacramento Co. 1993, San Joaquin 1988, Others at	1:24,000	Geo/SQL		N
	Delta levee maintenance information	DWR Central District Delta GIS Program	Delta Levees Subventions Program (SB34)	Kent Nelson	Legal Delta	polygon/ line	various	1:24,000	Geo/SQL		N
	Land use - Stone Lakes Study Area	Bureau of Reclamation	Stone Lakes Wildlife Refuge Feasibility Study	Chuck Johnson	Southwestern Sacramento County	polygon		1:48,000			N
	Property ownership - Upper Sacramento River	DWR Northern District	SB 1086	Stacey Cepello	Sacramento River from Verona to Keswick	polygon			Geo/SQL		N
	Public lands (ownership)	Teale Data Center		Pam Leonard	California	polygon	various	1:100,000	ARC/INFO		N
Infrastructure											
	Roads - California	Teale Data Center		Pam Leonard	California	line	various	1:100,000	ARC/INFO		N
	Railroads and transmission lines - California	Teale Data Center		Pam Leonard	California	line	various	1:100,000	ARC/INFO		N
Political boundaries											
	Reclamation districts (incl. levee miles) - Delta	DWR Central District Delta GIS Program	Delta Levees Subventions Program (SB34)	Kent Nelson	Legal Delta	polygon	various	1:24,000	Geo/SQL		N
	Statutory Defined Delta	Department of Conservation	Farmland Mapping and Monitoring Program	Greg Posely	Delta	polygon		1:24,000	Intergraph		N
	Cities - California	Teale Data Center		Pam Leonard	California	line	1990	1:100,000	ARC/INFO		N
	Counties - California	Teale Data Center		Pam Leonard	California	line	1990	1:100,000	ARC/INFO		N
Physical geography											
	Elevation (1 m intervals) - Bay/Delta	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster		1:250,000DEMS	GRASS		view only
	Lands below 1 foot elevation contour - Delta	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster	1987	1:100,000	GRASS		view only
	Basins - Bay/Delta	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster	1986 (base:1978)	1:100,000	GRASS		view only
	Watersheds - Bay/Delta	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster	1986 (base:1978)	1:100,000	GRASS		view only
	Drainage specific watersheds - Bay/Delta	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster	1975 & 1987 (base:1972)	1:500,000	GRASS		view only
	Islands - Delta	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster	1987	1:800,000	GRASS		view only
	Watersheds - California	Teale Data Center	CALWATER	Pam Leonard	California	polygon	varius	1:24,000	ARC/INFO		N
	Principal surface waters	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster	1986 (base:1993)	1:24,000 & 1:52,000	GRASS		view only

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Table A-1. Continued

Geology - Bay	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster	1972-1978	1:100,000	GRASS		view only
Natural Runoff Coefficient - Bay/Delta	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster	1974	1:500,000	GRASS		view only
Precipitation (mean annual) - Bay/Delta	CEDR, UC Berkeley	San Francisco Bay/Delta Geodatabase	Howard Foster	12 Bay - Delta counties	raster	1971	1:500,000	GRASS		view only
Land forms - Yolo Basin	Jones & Stokes Associates	Central Valley Habitat Joint Venture	Bruce Boyd	Yolo Basin	polygon	various	1:24,000	ARC/INFO		N
Soil types - Yolo Basin	Jones & Stokes Associates	Central Valley Habitat Joint Venture	Bruce Boyd	Yolo Basin	polygon	various	1:24,000	ARC/INFO		N
Hydric Soils - Yolo Basin	Jones & Stokes Associates	Central Valley Habitat Joint Venture	Bruce Boyd	Yolo Basin	polygon	various	1:24,000	ARC/INFO		N
Historic Meanders - Upper Sacrament River	DWR Northern District	SB 1086	Stacey Cepello	Sacramento River from Verona to Keswick	polygon	1896 - 1992 (?)		Geo/SQL		N
Geology - Upper Sacramento River area	DWR Northern District	SB 1086	Stacey Cepello	Sacramento River from Verona to Keswick	polygon			Geo/SQL		N
Projected erosion rates - Upper Sacramento River	DWR Northern District	SB 1086	Stacey Cepello	Sacramento River from Verona to Keswick	polygon			Geo/SQL		N
Shoreline	State Lands Commission			California (including Bay/Delta downstream of Sherman Island)	line	various	1:24,000	ARC/INFO		Y
100-year flood plain - Upper Sacramento River	DWR Northern District	SB 1086	Stacey Cepello	Sacramento River from Verona to Keswick	polygon			Geo/SQL		N
100-year flood plain - Delta	DWR Delta Planning Branch	North Delta Program	Ray McDowell	North Delta	raster, polygon	1994	1:24,000	GRASS		N
Hydrography - nationwide	USEPA	Reach File 3	Cheryl Henly	Nationwide	line	various	1:100,000	ARC/INFO		N
Hydrography - California	Teale Data Center		Pam Leonard	California	line	various	1:100,000	ARC/INFO		N
Elevation (Digital Elevation Models) - California	Teale Data Center		Pam Leonard	California	points	various	approximately 72 m intervals	ARC/INFO		N
Trace substances	San Francisco Estuary Institute	Regional Monitorinfg Program for Trace Substances (RMP)	Ted Daum	Day/Delta downstream from Sherman Island	point			ARC/INFO	sampling stations only - data with RMP	N
Bathymetry - Bay	San Francisco Estuary Institute		Ted Daum	Bay downstream from Carquinez Straight	points			ARC/INFO		N
Water quality - Bay/Delta	DWR, DFG, USBR	D-1485 Compliance Monitoring (IESP)	Karl Jacobs	San Pablo Bay - Delta (Point San Pablo - Green's Landing - Vernalis)	points	1971- present	N/A (98 points)	currently not in GIS, can be implemented		in part
Hydrodynamics - Bay	USGS	IESP	Rick Oltmann	San Francisco Bay - Freeport - Old and Middle River	points	1984 - present (Bay) 1992 - presen (Delta)	N/A (16 points)	currently not in GIS, can be implemented		N
Imagery										
Landsat Thematic Mapper Image bands 3,4,5 - California	University of California, Santa Barbara	California Gap Analysis Program	David Stoms	California	raster	1991	1:250,000 (100 m cells)	BIP		N
Spotview image (panchromatic)	DWR, DFG, USBR and other state and federal agencies		Paul Veisze (DFG)	California	raster	1992-1994	1:24,000 (10 m cells)	BIL	no public distribution	N
Digital aerial photography - Delta and Suisun Marsh	UC Berkeley	UC Berkeley Digital Library Project	Ken Gardels	Delta (incomplete), Suisun Marsh	raster	1993	1:24,000	J-PEG	Color Infra Red (Delta), Color (Suisun Marsh)	Y
Cultural resources										
Archaeological sites - Delta	DWR Delta Planning Branch	North Delta Program	Ray McDowell	North Delta	points	1994	1:24,000	GRASS	no public distribution	N
Historic sites - Delta	DWR Delta Planning Branch	North Delta Program	Ray McDowell	North Delta	points	1994	1:24,000	GRASS	no public distribution	N

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