SOUTH BAY SALT PONDS
RESTORATION PROJECT
FINAL DATA ACQUISITION PLAN

Prepared for

California State Coastal Conservancy
U.S. Fish & Wildlife Service
California Department of Fish & Game

Prepared by

H. T. Harvey & Associates

In Association with

PWA
Brown & Caldwell
EDAW

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INTRODUCTION

This document provides the Data Acquisition Plan for the South Bay Salt Pond Restoration Project. The purpose of the Data Acquisition Plan is to guide the collection of information pertinent to restoration planning. The Data Acquisition Plan identifies topics of data collection, identifies data sources, and specifies data collection processes and protocols.

The Data Acquisition Plan is the first step in the Information Gathering Task (Task 2) to be conducted by the PWA consultant team, with H.T. Harvey as the lead firm for this task. In the Information Gathering Task, we will compile and evaluate available existing information pertinent to the restoration planning. The work products of the Information Gathering Task will be a bibliography of published and unpublished literature/reports/data, a GIS database of existing spatial data, and a Data Summary Report. The Data Summary Report will summarize the pertinent information found, identify critical data gaps, and present recommendations for filling those gaps. The results of the Information Gathering Task will help provide a sound scientific basis for the restoration planning.

INFORMATION TOPICS

Information gathering efforts will be focused on the topics outlined in Table 1. The South Bay Salt Pond Restoration Project Management Team (PMT) developed the information topics identified in Table 1 based on the results of the Data Gaps Workshop. The respective firm leads will identify data gaps for each topic.

During the Information Gathering Task, each topic will be subject to an information survey consisting of:

- identifying potential sources of information/data (contained in this Data Acquisition Plan);
- contacting individuals and organizations that may have relevant data;
- reviewing and compiling the information;
- preparing a report summarizing the data and providing an assessment of data quality and utility;
- adding relevant literature citations to the project website's bibliographic database, and;
- making recommendations for further data collection, if appropriate.

There is a wealth of information available pertinent to project planning. One of the challenges of the project is to focus the data collection effort on only the most relevant information, since it's not feasible to conduct an all inclusive, exhaustive search. Therefore, Appendix A provides a list of the focused topics for information gathering, based on the more general topics in Table 1.

In addition to focusing on the topics from the Data Gaps Workshop (Table 1), data collection efforts will be focused on questions developed by the Science Team in the Science Strategy Report and additional questions and detailed objectives developed by the PWA Team.

Table 1. Information Gathering Topics.

Topic No.	Lead[1]	Topic	General Description of Information Sought
1	HTH	Wildlife Use of Ponds, Marshes, Sloughs, Mudflats, and Bay	Species range, distribution, and density, and species use of the applicable South Bay habitats. Species/area relationships. Presence/absence of key species. Population trends for key species. Local, regional and national/international significance of species use of South Bay/San Francisco Bay habitat.
2	HTH	Vegetation/Plankton in Ponds, Marshes, Sloughs, Mudflats, and Bay	Types and distribution of vegetation and plankton present in the applicable South Bay habitats

Topic No.	Lead[1]	Topic	General Description of Information Sought
3	PWA/HTH	Design of Habitat and Landscape	Wildlife dependence on specific plant species; nutrient cycling; optimal design of landscape features such as levees, islands, salt pannes, uplands; desired channel characteristics/viability of relict channels; characteristics of effective corridors. Presence of relict channels. Topographical information landside of urban levees.
4	PWA	Lessons Learned from Prior Restoration Projects	Successful and unsuccessful elements/approaches from past restoration projects, and how the successful elements can be duplicated for this project (case study review). Identification of potential reference sites.
5	PWA	Hydrodynamics and Related Data	Building on existing efforts by Moffatt & Nichol Engineers and USGS, complete the compilation of existing hydrodynamic and related (e.g., wind-wave) data, collect information on long-term water management plans for the Bay, and assess historic changes.
6	HTH	Invasive Species	Options for managing/controlling Spartina (build on Conservancy's Invasive Spartina Project), other invasive species. Assess threat from new non-native species. Invasive species effects on native wildlife. Options for encouraging colonization by native species.
7	HTH	Species-Specific	
7a.	HTH	Wildlife/Human Interaction Effects	Wildlife tolerance of and sensitivity to human activities. As much as possible, information on specific types of activities that may occur in the project area. Differentiate between feeding and nesting/reproductive effects, if possible.
7b.	HTH	Species Resilience/ Response of Species During Restoration	Ability of key species to adapt to restoration. What species can find habitat elsewhere? How will phasing of restoration affect species?
7c.	HTH	Predation	Predator presence and distribution in the project area (including population trends), most important/significant predators, effects of predation on key species, and options for predator/predation control, including marsh design features and buffer corridors. Effects of landfills on predators.
7d.	HTH	Contaminants in Wildlife	Contaminant concentrations in various types of wildlife in the project area, with a special emphasis on mercury.

Topic No.	Lead[1]	Topic	General Description of Information Sought
7e	HTH	Food Resources	How to maintain food resources of ponds
8	BC	Water and Sediment Quality	
8a.	BC	Physical distribution of Mercury and Other Contaminants in Project and Adjacent and Upstream Areas	Compile information on known contamination in and around the project area, with a special emphasis on the distribution of mercury. Other contaminants of concern in the South Bay will also be considered, including selenium, pesticides (DDT, dieldrin, diazinon) and other persistent organics like PCBs, and dioxin Compile the information into a data table, and provide the information on a GIS layer in the project database.
8b.	BC/Applied Marine Sciences	Mercury Methylation	Information on mercury methylation, including available information on mercury cycling and factors affecting mercury cycling.
9	BC	Effects of Cargill Operations	Likely long-term operations by Cargill (i.e., likely pond salinities, depths).
10	BC	Seasonal Pond/Groundwater Interactions	Infiltration rates, depth to groundwater, water sources for potential seasonal pond areas, soil characteristics
11	BC	Infrastructure Assessment	Building on work already performed, identify all infrastructures within the project area and infrastructure that could be affected by the project that is located outside of the project area. Plot infrastructure location on GIS layer(s) for the project database.
12	BC	Sediment	
12a.	BC/Han-Padron Associates	Imported sediment supply and quality	Compile existing information on potential sediment sources for imported sediment, including location of source, amount typically dredged, frequency of dredging episodes, geotechnical characteristics of sediment, and chemical content. Provide information in matrix format and on GIS layers for the project database.
12b	BC	Literature survey on in-place sediment quality (ponds, sloughs, bay)	Compile existing information on sediment quality in and around the salt ponds. Plot information on sediment types (e.g., mud, sand) and chemical content on GIS layers for the project database.

Topic No.	Lead[1]	Topic	General Description of Information Sought
12c	BC	Sediment characteristics for imported sediment	Sediment characteristics that foster vegetation growth, and minimize invasive species colonization
13	HTH	Vector Control	Factors that influence mosquito production, design elements to help control or reduce mosquito populations, effects of mosquito control projects on other species
14a	PWA	Flooding Issues Protection	Existing level of flood protection, areas subject to tidal flooding and associated economic damages. Review Siegel & Bachand information, flood reports from the Corps, M&N reports for SBSP, reports from Alameda and Santa Clara flood control districts, FEMA coastal flood insurance studies, and other sources.
14b.	Geomatrix	Levee Conditions	Existing levee conditions and required maintenance to support existing conditions.
15	EDAW	Recreational Use and Public Access	Existing recreation plans, policies, trail maps, and access requirements of the numerous state, regional, and local jurisdictions within the project area will be reviewed. Additionally, recreational use data will be obtained from agencies and stakeholders for development of the Plan.

[1] HTH= H. T. Harvey & Associates; PWA= Philip Williams & Associates; BC= Brown & Caldwell

INFORMATION SOURCES

Appendix B provides a list of information sources to be contacted and the topics to which they pertain. Since the PWA team members have extensive in-house libraries containing "gray" literature, we will also review these in-house libraries for relevant information. The types of information collected will consist of unpublished gray literature, scientific publications, maps and spatial data available in or transferable to GIS format, and raw field data relevant to the topics shown in Appendix A.

We anticipate that much of the information pertinent to South Bay Salt Pond restoration planning is in the gray literature and in unpublished raw field data sets. For example, the Point Reyes Bird Observatory (PRBO) and the San Francisco Bay Bird Observatory (SFBBO) have raw bird census data that would be useful in characterizing existing conditions and in assessing effects of tidal wetland restoration options on shorebird populations. In addition, numerous field data collection efforts are currently in progress for the South Bay Salt Pond Restoration Project by the U. S. Geological Survey (USGS), Moffatt & Nichol Engineers, and others. USGS field data collection includes bathymetric surveys of the salt ponds, characterization of the water quality, primary productivity, invertebrate communities and fish communities of the salt ponds and South Bay sloughs, baseline monitoring of bird use in the salt ponds, and topographic mapping of the South Bay.

DATA ACQUISITION PROCESS AND PROTOCOLS

BIBLIOGRAPHIC INFORMATION

A bibliography of pertinent references will be compiled using the End Note software program. The bibliography will include citations for published scientific papers, unpublished, "gray" literature (reports), and useful raw data sets. The bibliographic information compiled by the PWA Team will be added to the annotated bibliography on the South Bay Salt Pond Restoration Project's website. The citations we compile will include the basic information shown below in example citations from the Annotated Bibliography on the project's website. We will include the abstract or a brief summary (2-4 sentences) for a subset of references that are judged as especially valuable to the restoration planning effort.

A manual for assessing restored and natural coastal wetlands with examples from Southern California	
Zedler et al: Pacific Estuarine Research Laboratory	1990
Reference type:	Report
Full reference: Zedler et al.: Pacific Estuarine Research Laboratory. 1990 A manual for assessing restored and natural coastal wetlands with examples from Southern California. California Sea Grant Report No. T-CSGCP-021	

A Review of the Physical and Biological Performance of Tidal Marshes Constructed with Dredged Material in San Francisco Bay, California, Draft Report.	
Long-Term Management Strategy (LTMS)	1994
Reference type:	Report
View details	
Results summary or abstract Previous studies have correlated dredged sediment placed at high elevations (approximately 0.5 ft below MHHW) with poor tidal channel formation (LTMS 1994); if the high marsh goal does not depend on extensive channel formation, then such a concern would not apply.	

The search engine for the project website's bibliography is set up to retrieve citations by any word that appears in the title, author, or abstract fields. It is also possible to search by any of the twenty (20) restoration decisions previously identified by the project management team. Therefore, we will also set up a field in End Note to record the restoration decision number(s) and the topic(s) (from Table 1 above) to which each reference is pertinent. In addition, where key documents are available in .PDF format and owner permission is easily acquired, we will provide entire documents/papers in .PDF format for inclusion on the website.

The project's annotated bibliography website is currently maintained by the San Francisco Estuary Institute (SFEI) and Michael May is the contact. Max Busnardo of H. T. Harvey & Associates has initiated communications with Michael May to coordinate efficient transfer of the

team's bibliography to the project website. The PWA team plans to provide the entire team's End Note bibliography to SFEI. SFEI would then upload the bibliography to the project website.

GEOGRAPHIC INFORMATION SYSTEM DATA

EDAW will coordinate GIS data gathering for the PWA Team and will create a data dictionary of all GIS data collected for this project. SFEI will ultimately host this GIS information, however, EDAW will create the GIS database for this project and the PWA team. EDAW, SFEI and the City of San Jose Environmental Services Division (ESD) will be in continual contact to ensure that all entities are using the most recent information as well as to coordinate new data collection efforts. For example, H.T. Harvey & Associates has determined that imagery available from the IKONOS 3 satellite is adequate for the South Bay Salt Pond Restoration Project's habitat mapping needs and for the City of San Jose ESD's 2004 South Bay Marsh Mapping Project. The City of San Jose ESD, in turn has offered to fund the acquisition of IKONOS satellite imagery for the South Bay Salt Pond Restoration Project Area. All new GIS layers derived or developed for the project and all data added to existing GIS layers that are to be updated shall be accompanied by XML-formatted metadata that follows the FGDC Digital Geospatial Metadata standards. The metadata fields that are required for each GIS layer can be listed using ESRI's ArcCatalog 8.3 FGDC Editor. All fields displayed using FGDC Classic Style Sheet will be completed. The software will fill out certain fields automatically. All other fields will be completed manually.

When using ArcCatalog's FGDC Editor, there are numerous fields displayed for input that do not appear on the output for the FGDC Classic Style Sheet. The consultant team will provide as much of this information as possible. However, only the following fields PLUS those marked "Required" in the editor must be completed:

Definition for each attribute field. Attribute fields with coded values will include descriptions of the codes. These can be entered in ArcCatalog as Attribute Domain Values or listed separately in a look-up table;
Contact E-Mail Address;
Complete Spatial Reference Information. All shapefiles, geodatabases or coverages will be in the following coordinate system: UTM NAD83 (meters) Zone 10 North, Horizontal datum NAD83, Vertical Datum NAVD83. File format for GIS data should be one of the following: ESRI shapefile, ESRI Coverage(.e00), GeoTIFF, CAD formats (AutoCAD, DXF, or similar) are not acceptable, and;
Source Information. This will be entered under Data Quality, Source Information on the General, Source Citation and/or Source Time Period of Content tabs.

The following pond labeling scheme will be used for data associated with individual ponds: Baumberg/Eden Landing Pond numbers are to be preceded by "E", Newark Ponds (between RR and Alameda Flood Control Channel) are to be preceded by "N", Mowry ponds (south and west of RRs and north of Mud Slough) are to be preceded by "M", Alviso ponds are already preceded by "A", and West Bay ponds that were part of purchase are to be preceded by "R". Pond numbers from Leslie/Cargill operations will be used.

The PWA team will provide complete metadata for GIS information we create or add to existing data. We will not update or fill in metadata for existing GIS data compiled from outside sources. In other words, we will provide our process information, but will not try to explain the original source's process information.

We will assess the quality and usability of the existing GIS data in several ways:

By coordinating GIS data collection efforts with SFEI and the City of San Jose ESD, who both have extensive hands-on familiarity and expertise with the existing data sources for the project area;
By reviewing the metadata, if it exists, to assess whether or not a scientifically valid process was used;
By contacting the source of the information to discuss how they created the dataset (especially if there is no metadata), and;
By comparing the data to other sources of information and discussing the information with local experts and our technical staff. For example, if we receive location information regarding a certain species and a biologist knows that information is incorrect, we would not use that data.

In addition, data accuracy will vary spatially throughout the project site. We will factor the varying degree of data accuracy into our analysis.

LIST OF PREPARERS

The following H. T. Harvey & Associates' staff prepared the Draft Data Acquisition Plan:

Ron Duke, M.A., Wildlife Ecologist
Max Busnardo, M.S., Restoration Ecologist
Helen Dijkstra, Ph.D., Restoration Ecologist
Scott Terrill, Ph.D., Ornithologist
Dan Stephens, B.S., Restoration Ecologist
David Johnston, Ph.D., Wildlife Ecologist

With:

Don Danmeier, Amy Stewart, and Michelle Orr: Philip Williams & Associates
Cindy Paulson and Jenny Gain: Brown & Caldwell
Megan Gosch and Donna Plunkett: EDAW

APPENDIX A.
Data Gathering Topics

Topic #	Topic Name	Type of Information to be Sought	Species/Chemicals *indicates priority
1	**Wildlife**	**Topics to be reviewed for priority wildlife species:** Range, distribution, and density Species/Area relationships Regional/Global population trends Habitat requirements Importance of bay and salt pond habitats to species at local, regional, global scale; Potential conflicts between focus species habitat requirements; Legal status; Movement/dispersal; Effects of *Spartina alterniflora* and *Lepidium latifolium invasion* on habitat quantity/quality and thus, habitat use by California Clapper Rail and salt marsh harvest mouse ; salt marsh harvest mouse refugial habitat requirements; how far will salt marsh harvest mice travel across barren areas, water, through grasses, and through non-habitat (e.g. tules, bulrushes)?, and; genetic variaton in salt marsh harvest mouse populations. Levee use	Salt marsh harvest mouse* Steelhead* California Clapper Rail* Snowy Plover* Alameda Song Sparrow* Salt Marsh Common Yellowthroat* Colonial Terns and Gulls* Shorebirds (general)* Waterbirds (general)* Salt pond associated bird species* Harbor seal California Least Tern Chinook salmon White sturgeon Bay goby Top smelt California Black Rail Coast garter snake Salt marsh wandering shrew Yuma bat Burrowing Owl
2	**Vegetation, Plankton**	**Topics to be reviewed for priority native plants (special status and characteristic species):** Distribution: current and potential; Life history: germination requirements, reproduction; Environmental requirements: sediment, topography, salinity, flooding, disturbance, and; Community/Ecosystem Ecology: inter-specific competition, wildlife value, biogeochemical effects.	**Special Status Species (opportunities for recovery):** *Cordylanthus maritimus ssp. palustris* (Point Reyes bird's beak) * *Lasthenia conjugens* * *Suaeda californica* (California seablite) * *Astragalus pycnostachyus* var. *pycnostachyus (* coastal marsh milk-vetch) *Equisetum palustre* (marsh horsetail) *Lathyrus jepsonii* var. *jepsonii (* delta tule pea) *Lilaeopsis masonii (* Mason's liaeopsis) *Plagiobothrys chorisianus* var. *hickmanii (* Hickman's popcorn-flower) *Plagiobothrys glaber (* hairless popcorn-flower) *Trifolium depauperatum* var. *hydrophilum (* saline clover)
			Characteristic Tidal Marsh Plant Species *Spartina foliosa** *Salicornia virginica** *Scirpus maritimus** *Scirpus acutus** *Scirpus californicus** *Typha angustifolia** *Grindelia stricta* *Jaumea carnosa* *Distichlis spicata* *Frankenia salina*

* Indicates species, species groups that will be a priority during data collection.

Topic #	Topic Name	Type of Information to be Sought	Species/Chemicals *indicates priority
3	**Habitat, Landscape Design**	**Biology** Wildlife dependence on specific plant species; Historic habitat mosaic in South Bay; Characteristics of effective corridors for wildlife movement; Structure/function of existing "reference" Tidal Marshes in South Bay; Impacts of tidal marsh restoration on outboard mudflats and established marsh habitat; Distribution and factors that control distribution of dominant plant species; Optimal design of landscape features/habitat types; levees, salt pannes, uplands, open water, mudflat, tidal salt marsh, tidal brackish marsh, etc., and; Salinity requirements and range of tolerances for restoration target species.	
		Geomorphology Nutrient cycling; Large scale sediment dynamics/Sediment availability/Sediment budget; Desired channel characteristics; Presence/Viability of relict channels, and; Topographical information landside of urban levees.	
		Hydrology Subsidence / Sea Level Rise Rates.	
4	**Prior Restoration Projects: Lessons Learned**	Use of Fill Placement; Effects of Inadequate Tidal Drainage; Channel Network Morphology; Time Scales of Tidal Wetland Evolution; Performance of Physical Elements (e.g. ditch blocks, starter channels, habitat levees); Control of Wind/Wave Impacts, and; Successful colonization of target species.	
5	**Hydrodynamics**	Fresh Water Flow Rates and salinities Characterization of Suspended Sediment Concentrations in southern South Bay; Hydrology and morphology of South Bay sloughs; Characterization of Wind Waves over Mudflats and Shallows; Wind/Wave Resuspension of sediments Historic Changes in Bay Hydrodynamics; Bathymetric Changes, and; Review of Existing Bay Hydrodynamic Models.	
6a	**Invasive Species: Plants**	**Topics to be reviewed for priority invasive plants:** Distribution: current and potential; Life history: germination requirements, reproduction; Environmental requirements: sediment, topography, salinity, flooding, disturbance; and Impacts: competitive effects, wildlife interactions, biogeochemical effects; Management/Control methods: current activities, recruitment of native over non-native species, control of new invasive species, monitoring methods, and; Current research programs.	*Spartina alterniflora** *Spartina alterniflora x foliosa* hybrid* *Lepidium latifolium ** *Arundo donax* *Atriplex semibaccata* *Bassia hyssopifolia* *Brassica nigra* *Carpobrotus edulis* *Conium maculatum* *Cortaderia jubata* *Cortaderia selloana* *Foeniculum vulgare* *Hydrilla verticillata* *Mesembryanthemum* spp. *Myoporum laetum* *Phragmites australis* *Rubus discolor* *Salsola soda* *Spartina anglica* *Spartina patens* *Tamarix parviflora, T. ramosissima, T. chinensis, T. gallica* *Zostera japonica*

* Indicates species, species groups that will be a priority during data collection.

Topic #	Topic Name	Type of Information to be Sought	Species/Chemicals *indicates priority
6b	**Invasive Species: Animals**	**Topics to be reviewed for priority invasive animals:** Threats to native wildlife; Management/Control methods: current activities, monitoring methods; Recruitment of native species over invasive, non-natives, and; Control of new invasive wildlife species.	Chinese mitten crab* Green crab* Inland silverside* Feral cat* Red fox* House mouse Hydromedusae (Cnidaria) Exotic snails (several species) Asian clam Crayfishes Yellowfin goby Striped bass Brown-headed Cowbird Norway rat Roof rat Domestic cat
7	**Species Specific**		
7a	**Wildlife/Human interactions**	Size/type of buffer zones to protect breeding and/or foraging shorebirds, waterbirds, and harbor seals; Effects of watercraft on nesting birds and harbor seals; Effects of trails on habitat use by key species; Effects of noise pollution (from construction) on key species breeding &/or foraging in area; Human activity effects on wildlife feeding, and; Human activity effects on wildlife nesting/reproduction.	
7b	**Species responses during restoration**	Site fidelity of key species; Availability of alternate sites for species during construction and restored habitat establishment period; Re-colonization of key species currently absent or forced out during construction, and; Restoration phasing effects on key species.	
7c	**Predation**	 Predator presence/distribution in project area; Predator population trends; Options for predator control; Effects of predation on key species; Potential for restoration to attract new/additional predators to area, and; Effects of landfills on predator species richness and density.	**Predators** Striped bass Feral dogs Norway rats and roof rats Raptors (predators on shorebirds and nests) Gulls (nest predators) corvids, racoons, skunks
7d	**Contaminants in wildlife**	 Distribution & concentration of contaminants in the Bay; Ability to bioaccumulate in wildlife; Toxicity level in key species; Toxicity level in key species; Physical effects on key species: Bioaccumulation of methylmercury, selenium toxicity, altered glutathione metabolism, oxidative stress, thinning of eggshells; Prevention of buried contaminants release into the water column during restoration; Monitoring contaminants, and; Long-term management of contaminants.	**Wildlife Species** Breeding Shorebirds* Piscivorous birds (e.g., California Least Terns)* Bivalves and other benthos Salmonids Migratory Shorebirds (e.g., Long-billed Curlews) Yuma bats and Mexican free-tailed bats
			Contaminants Mercury and methylmercury* Selenium* Organochlorine* Lead Cadmium Arsenic Copper Nickel DDT PCBs PBDEs Cytochrome 450 Organohalen (halogenated) compounds
7e	**Food resources**	Maintaining pond food resources.	
8	**Water and Sediment Quality**		
8a	**Physical distribution of Mercury/Other Contaminants**		Mercury PCBs Others: dioxin, DDT, PBDEs
8b	**Mercury Methylation**	Mercury methylation. Mitigation measures.	

* Indicates species, species groups that will be a priority during data collection.

Topic #	Topic Name	Type of Information to be Sought	Species/Chemicals *indicates priority
9	**Effects of Cargill Operations**	Probable long-term operations, and; Physical implications: pond salinities, depth etc..	
10	**Seasonal Pond/Groundwater Interactions**	Water table; Infiltration rates, and; Soils.	
11	**Infrastructure Assessment**	Transportation; Wastewater discharges; Water/storm water systems; Power; Landfills; Parks, and; Buildings.	
12	**Sediment**	Sediment source locations;	
12a	**Imported Sediment Supply and Quality**	Amount of sediment typically dredged; Frequency of dredging episodes; Geotechnical characteristics of sediment, and; Chemical content.	
12b	**In-place Sediment Quality**	Ponds; Sloughs, and; Bay.	
12c	**Imported Sediment Characeristics**	Characteristics suitable for target habitat establishment and that minimize invasive species colonization.	
13	**Vector Control**	Factors that influence mosquito production in tidal marsh systems; Design measures to control/reduce mosquito populations, and; Effects of mosquito control measures on other species.	Mosquitoes (4 species)*
14	**Flood Protection**	Existing Infrastructure;	
14a	**Flooding Issues Protection**	Existing level of flood protection; Coastal and riverine flood studies; Areas subject to riverine flooding; Areas subject to tidal flooding, and; Economic impacts of tidal flooding.	
14b	**Levee Conditions**	Construction methods of levees; Levee materials, and; Subsurface conditions beneath levees.	
15	**Recreational Use and Public Access Task 1: Research & Data Collection**	Agency/Group policies (Management); Recreation use (Social), and; Wildlife/Habitat compatibility (Biological).	
	Task 2: ID and Map Recreation Features	GIS Data/Mapping: Regional parks, open space, management boundaries, existing and proposed trails, visitor access facilities, cultural points of interest, regional campgrounds, boat launches, transportation links	
	Task 3: ID Access / Recreation Opportunities and Constraints	Physical, hydrological/restoration, biological, social/educational, policy/management	

* Indicates species, species groups that will be a priority during data collection.

APPENDIX B.
Information Sources

Source				Topic	GIS/ Mapping Data
Institution	**Interest Group**	**Name**	**Contact Information**		
Private Firms					
Cargill Salt	SBSP Stakeholder Forum	Robert Douglas	(510) 797-1820	9	
	SBSP Stakeholder Forum	Barbara Ransom	(510) 797-1820	9	
CH2M Hill		Dave Von Rueden	(408) 436-4909		
GIS Data Depot			http://data.geocomm.com/	2	x
HJW Geospatial			http://www.hjw.com/	2	x
Hultgren Tillis Engineers	Levee Flood Management Report - due in February 2004	Ed Hultgren		14a, 14b	
IKONOS Space Imaging Photos			http://www.spaceimaging.com/products/default.htm		x
Jones and Stokes			(408) 434-2244	1, 2, 3, 4	
Life Sciences, Inc. (on team)		Lisa Stallings	http://www.lifescienceinc.com/	2, 4	
Moffatt & Nichol		Dilip Trivedi	dtrivedi@moffattnichol.com (925) 944-5411	5, 14b	
Northwest Hydraulic Consultants, Inc.		Bob MacArthur	(916) 371-7400		
Olivia Chen Consultants	SFPUC tunnel sediment contact	Derrick Wong	(415)522-5051	12a	
PG&E		Bob Gray	(415)973-3773	11	
Sea Engineering		Ken Israel	kisreal@seaengineering.com	5, 8a, 8b, 9, 10 12a, 12b, 12c	
Terra Server VGIS	VGIS			14a	
URS		Fran Demgen	(510) 874-3600	1, 2, 3, 4	
Wetlands and Water Resources		Stuart Siegel		2, 3, 4	
Academic Institutions					
Cal Academy	Plants and Animals (Database)		http://www.calacademy.org/	1, 2, 6	
Jepson Herbarium			http://ucjeps.berkeley.edu/active.html	2, 6	
Long Marine Laboratory					
Moss Landing Marine Laboratory		Jim Harvey	harvey@mlml.calstate.edu	1, 7a, 7b, 7c	
Pacific Estuarine Research Laboratory (PERL)		Joy Zedler	(608) 265-9272 or (608) 262-8629 http://www.sci.sdsu.edu/PERL/PERL.html	1, 2	
San Francisco State University			http://www.sfsu.edu/	2	
San Jose State University	Lead scientist SBSPR	Lynn Trulio	ltrulio@earthlink.net (408) 924-5445	1, 4, 7a, 7b, 7c	
Stanford University		Rachel Simons	simons@stanford.edu	5, 12a, 12b, 12c	
		Stuart Gannes	sgannes@stanford.edu	2	
	Center for Conservation Biology	Alan Launer	650-725-1854	1, 2, 6	
University of San Francisco		John Callaway	callaway@usfca.edu	2	
University of Wisconsin	CALFED Mercury Strategy	Jim Wiener	wiener.jame@uwlax.edu (608)785-6454	8a, 8b	
The Academy of Natural Sciences	CALFED Mercury Strategy	Cynthia Gilmour	gilmour@acnatsci.org (410)586-9700	5, 8a, 8b	
UC Berkeley	UC Berkeley Mercury Roundtable	David Sedlack	sedlak@ce.berkeley.edu (510) 643-0256	2, 8a, 8b	
	Museum of Vertebrate Zoology (Database)		http://elib.cs.berkeley.edu/mvz/	1	
	Environmental Science, Policy & Management- Spartina/Wildlife	J. Cully Nordby	nordby@nature.berkeley.edu.ca	6	
	Habitat Mapping	Maggi Kelly		2	x
UC Davis, Bodega Marine Lab		Debra Ayres	707-875-2211, drayres@ucdavis.edu	2, 6	
UC Davis	CALFED Mercury Strategy	Darrell Slotton		8a, 8b	
UC Davis		Randall, DiTomaso, Rejmanek		6	
Federal					
National Aeronautics and Space Administration (NASA)			http://www.nasa.gov/home/index.html	2, 6	
National Oceanic and Atmospheric Administration (NOAA) San Francisco Bay Environmental Sensitivity Index				15	x
NOAA Central Library			http://www.lib.noaa.gov/	1, 2, 7	
NOAA Coastal Change Analysis Program (C-CAP).		Steve Raber	Steve.Raber@noaa.gov, http://www.csc.noaa.gov/crs/lca/ccap.html	3	
NOAA National Ocean Service (NOS)			http://co-ops.nos.noaa.gov/bench_mark.shtml?region=ca	4, 5	
NOAA real time tides/currents/wind data			http://tidesandcurrents.noaa.gov/sfports/sfports.html	5	
NOAA - Fisheries		Brian Mulvey		1	
San Francisco Bay National Wildlife Refuge (SFBNWR)			http://desfbay.fws.gov/	1, 2, 4, 6, 7c, 9, 15	
		Marge Kolar	margaret_kolar@mail.fws.gov (510) 792-0222		
		Clyde Morris	(510) 792-4275		

Source				Topic	GIS/ Mapping Data
Institution	**Interest Group**	**Name**	**Contact Information**		
US Army Corps of Engineers (US ACE)		Ed Wiley: South Section Chief	(415) 977-8464	15	
		Central Library	http://lepac1.brodart.com/search/um/	4, 5	x
	Hamilton Air Field Study	Victor McFarland	victor.a.mcfarland@erdc.usace.army.mil (601)634-3721	8b	
	Contributors to the "Long-term Management Strategy for the Placement of Dredged Material in the San Francisco Bay; Management Plan, 2001" (Dredged Material Management Office, DMMO)	David Dwinell	david.l.dwinell@usace.army.mil (415)977-8471	12a	
		Bob Quebedeaux			
		Molly Martindale			
USACE FEMA Mapping				14a	
USACE SF District		Arijs Rakstins	Arijs.A.Rakstins@spd02.usace.army.mil	3	
		Lynne Galal	lgalal@spd.usace.army.mil or (415) 977-8712		
US Department of Agriculture (USDA)			http://www.usda.gov/	2, 6, 7c	
US Department of Agriculture - NRCS	Soils and infiltration	Jon Werner	jon.werner@usda.gov (202)720-4895	10	
US Environmental Protection Agency (USEPA)	Contributors to the "Long-term Management Strategy for the Placement of Dredged Material in the San Francisco Bay; Management Plan, 2001"	Diane Fleck	http://www.epa.gov/	8b, 12a	
		Hugh Barroll	http://www.epa.gov/		
		Mike Monroe	http://www.epa.gov/		
US Fish and Wildlife Service (US FWS)	reference system		http://fa.r9.fws.gov/r9fwrs/dbinfo.htm	1, 2, 7a, 7c, 15	
	Vegetation/PMT	Clyde Morris	clyde_morris@fws.gov (510) 792-4275 x 25	11	
	CALFED Mercury Strategy	James Haas	(916)414-6604	8b	
		Dan Buford	daniel_buford@fws.gov (916) 414-6625		
	USFWS Region 1, Regional GIS Coordinator	Dan Avery	dan_avery@r1.fws.gov, 503-872-2735		x
		Jim Browning	James_Browning@fws.gov, (916) 414-6649		
US FWS Refuge Data	Recreation Use Data	Carmen Leong-Minch	Carmen_Leong-Minch@FWS.GOV 510/792-0222	15	
US Geological Survey (USGS)	Primary contact	David Schoellhamer	dschoell@usgs.gov or (916) 278-3126	1, 2, 15	
	GIS: DOQQ aerials		http://casil.ucdavis.edu/casil/usgs.gov/doq/	2, 4, 5	DOQQ aerials
		John Takekawa	john_takekawa@usgs.gov	1, 2, 8a, 12b	
	GIS: Quad Maps		http://casil.ucdavis.edu/casil/gis.ca.gov/drg/	2, 4, 5	Quad maps
	CALFED Mercury Strategy	Mark Marvin-DiPasquale	mmarvin@usgs.gov (650)329-4442	8b	
			http://ca.water.usgs.gov	14a	
	Sediment information	Bruce Jaffe	bjaffe@usgs.gov	12	
	Sediment information	Jessica Lacey	jlacy@usgs.gov or (831) 427-4720	12	
USGS Natl. Wetlands Research Center Library			http://cuadra.nwrc.gov/star/	1, 2, 6	
USGS SF Bay & Delta Info			http://sfbay.wr.usgs.gov/access/SFB_Biblio.html+C55	1, 5	x
USGS, Water Resources Division	CALFED Mercury Strategy	David Krabbenhoft	dpkrabbe@usgs.gov (608)821-3843	8b	
State					
CA Department of Fish and Game (CDFG)			http://www.dfg.ca.gov/	1, 2, 6, 7a, 15	x
		John Krause	jkrause@dfg.ca.gov		x
		Todd Keeler-Wolf	(916)324-6857		
		Mark Stephenson	(831)771-4177	8b	
		Carl Wilcox	cwilcox@dfg.ca.gov (707)944-5525		
CA Natural Diversity Database (CNDDB)			http://www.dfg.ca.gov/whdab/html/cnddb.html	2, 6	x
California Wildlife Conservation Board		Al Wright	http://www.dfg.ca.gov/wcb/	1	
				1	
CALFED		Patrick Wright	http://calwater.ca.gov/	3, 4, 7d, 8a	
California Resources Agency – Legacy Projec			http://resources.ca.gov/	15	
California Spatial Information Library			http://gis.ca.gov	2, 4, 5	x
California State Coastal Conservancy			http://www.coastalconservancy.ca.gov/	3, 4	
		Nadine Hitchcock	510-286-4176, nhitchcock@scc.ca.gov		
		Amy Hutzel	ahutzel@scc.ca.gov (510) 286-4180		
California Water Resources Control Board			http://www.swrcb.ca.gov/	4	

Source				Topic	GIS/ Mapping Data
Institution	Interest Group	Name	Contact Information		
CalTrain		Darryl Maxey	650-508-7922	11	
CalTrans			http://www.dot.ca.gov/		
	District 4 Environmental Engineer	Peter Altherr	(510)286-4668	11	
		Frank Gorham	(650)508-6200	11	
		Darryl Maxey	(650)508-7922		
	Eel Grass Study	Ahmand Hashemi			
Department of Water Resources (DWR)	Hydrogeology (Water table/groundwater interactions)	Carl Hauge	chauge@water.ca.gov (916)651-9649	10	
		Neal Fujita	(510) 649-3313		
Mesquito and Vector Control Association of California		John Rusmiel	http://www.mvcac.org/	13	
Union Pacific Railroad		Brock Nelson	(916)789-6370	11	
Cities				2	
City of San Jose	Comprehensive Plan	Laurel Prevetti	(408)277-5183	11	
City of Fremont		Barbara Silva	(510)494-4739	11	
City of Menlo Park		Rich Boyer	(650)780-7473		
		Marilyn Harang (PW)	(650)780-7477		
City of Milpitas (Utilities)		Darryl Wong		11	
City of Mountain View (Public Svcs)		Dave Serge	(650)903-6329	11	
City of San Jose	Environmental Services Dept.	Dan Bruinsma	dan.bruinsma@ci.sj.ca.us 408-277-2993	8a, 12b	marsh mapping project
	Pond A18	David Tucker	(408) 945-3711	8a, 12b	
	CALFED Mercury Strategy	James Downing	(408)945-5168	8b	
		Michael O'Connell	(408)277-8503	11	
		Bob Wilson		11	
		Neal Van Keuren	neal.vankeuren@ci.sj.ca.us, (408)945-5144	15	
City of Palo Alto	Watershed Management Plan	Alice Ringer	alice.ringer@cityofpaloalto.org (650)484-3819	8a, 12b	
City of Palo Alto		Daisy Stark	(650)329-2287	11	
City of Sunnyvale	Habitat Restoration	Kristy McCumby	kmccumby@ci.sunnyvale.ca.us	3	
Counties					
Alameda County				15	
Alameda County Environmental Services			http://www.co.alameda.ca.us/aceh/index.htm 510-567-6790	1, 2, 7a, 14a	x
	Environmental Services	Rick Baker	(510) 670-5776	1, 2, 7a, 14b, 15	
	Environmental Health Department	General contact	(510)567-6790		
		Ron Torres	(510)567-6736	11	
Alameda County Flood Control District			http://www.co.alameda.ca.us/pwa/flood.shtml		
		Hank Ackerman	(510)670-5553	12a	
		Ralph Johnson	joh19701@comcast.net	14a	
Alameda County Vector Control		John Rusmiel		13	
Contra Costa County			http://www.co.contra-costa.ca.us/	15	
Contra Costa County Water Agency		Roberta Goulart	(925)335-1226	12a	
				2	
		Cathy Woodbury			
	Planner	Ana Ruiz	(650) 691-1200		
Santa Clara County	Environmental Health Department		(408)918-3400		
Santa Clara County Vector Control	Vector Control	Daniel A. Strickman	daniel.strickman@deh.co.sci.ca.us (408) 792-5542	13, 15	
	Vector Control	Noor Tietze	tietze@hotmail.com (408) 299-2050	13	
SF Bay Area County Vector Control Agencies	Vector Control			13, 15	
San Mateo County				15	
San Mateo County Vector Control		Chindi Peavey	CPeavey@smcmad.org (650) 344-8592 x 32	13	
Local Government					
Bay Area Clean Water Agencies		Gerald Raycraft, Director of Planning and Coordinator		7a, 15	x
Bay Area Stormwater Management Agencies Association			http://www.basmaa.org/	8a, 12b, 15	
City of San Jose Environmental Services Division		Neal Van Keuren	neal.vankeuren@ci.sj.ca.us (408) 945-5144	5	Veg Maps
Port of Oakland		Jim McGrath	jmcgrath@portoakland.com (510)627-1100	12a	
Port of Redwood City		Don Snaman	(650)306-4150	12a	
San Francisco Bay Area GIS Demonstration Project			http://www.regis.berkeley.edu/bagis/	2	x
San Francisco Bay Conservation and Development Commission (BCDC)	Principal permit analyst	Andrea Gaut	http://www.bcdc.ca.gov/	7a, 15	x
	Chief Planner	Jeffry Blanchfield	(415) 352-3600		
	deputy director	Steve McAdam	(415) 352-3600	12a	
	access	Brad McCrea			
	subtidal goals report	Katherine Wood			
	Chief of Permits	Bob Batha	(415) 352-3600	7a, 15	
	EIR - Newark Crystalizer Ponds	Joe LaClair	(415) 352-3600	9	
	Program Director of Dredge Management	Steve Goldbeck		12	
	Analysist of Dredge Management	Brenda Goeden		12	
	Executive Director	Will Travis			

Source				Topic	GIS/ Mapping Data
Institution	**Interest Group**	**Name**	**Contact Information**		
San Francisco Bay Joint Venture		Beth Huning			
San Francisco Regional Water Quality Control Board (SFRWQCB)				2, 5, 8a, 8b, 9	
	Mercury TMDL	Steve Moore	smm@rb2.swrcb.ca.gov (510)622-5439	8a, 12b	
		Tom Mumley	tem@rb2.swrcb.ca.gov (510)622-2395	8a, 12b	
		Bill Johnson	bjj@rb2.swrcb.ca.gov (510)622-2354	8a, 12b	
		Richard Looker	rel@rb2.swrcb.ca.gov (510)622-2451	8a, 12b	
	PCB TMDL	Fred Hetzel	fh@rb2.swrcb.ca.gov (510) 622-2397	8a, 12b	
	Water Quality Data	Andree Breaux	ab@rbz.swrcb.ca.gov (510)622-2324	8a, 12b	
	Contributors to the "Long-term Management Strategy for the Placement of Dredged Material in the San Francisco Bay; Management Plan, 2001"	John Kaiser	jek@rb2.swrcb.ca.gov	12a	
	Dredged Materials	John West	(510) 622-2438	12b	
		Thomas Butler			
		Mary Rose Cassa			
		Beth Christian			
		Tobi Tyler			
		Robert Schlipf			
		Brian Wines			
		Shin-Roei Lee			
		Glynnis Collins	gnc@rb2.swrcb.ca.gov (510)622-2318	12b	
Parks					
Bay Area Open Space Council			http://www.openspacecouncil.org/	7a, 15	
East Bay Regional Parks District		Mark Taylor	http://www.ebparks.org/	7a, 15	
	Baumberg Restoration Tract	Patti Zierman	510-544-2300	7a, 15	
	Habitat Restoration	Brad Olson	bolson@ebparks.org 510-544-2622	11, 14a, 15	
		Neil Fujita			
Livermore Area Recreation and Park District	Ranger Supervisor	Mike Nicholson	925-373-5770	7a, 15	
Mid Peninsula Regional Open Space District			http://www.openspace.org/	7a, 15	
	Habitat Restoration	Cindy Roessler	croessler@openspace.org	3	
Santa Clara County Parks	Habitat Restoration	Mark Frederick	mark.frederick@prk.sccgov.org		
Water Districts					x
Alameda County Water District (ACWD)	Water resources planner	Eric Cartwright	eric.cartwright@acwd.com (510)668-4206	1, 2, 5, 10, 11	
		Dan Bentley	(510)668-4414	11	
East Bay Dischargers Authority (EBDA)	Joint wastewater effluent outfall	Chuck Weir	ebdacvw@flash.net (510)278-5910	11	
Palo Alto Wastewater Treatment Facility	Plant Manager	Bill Miks	(650)329-2243	11	
Santa Clara Valley Water District (SCVWD)	District's Project Manager for SBSPR	Beth Dyer	bdyer@valleywater.org (408) 265-2600 x3125	1, 2, 5, 6, 7c, 8a, 8b, 10, 11, 12a, 12b, 14a, 14b, 15	
	Mercury TMDL, CALFED Mercury Strategy, Guadalupe River (draft conceptual model and synoptic surveys), Pond A4	Dave Drury	ddrury@valleywater.org (408)265-2600	2, 5, 8a, 8b, 12a, 14a	
	Groundwater levels/infiltration rates	Tom Mohr	(408)265-2607 X3760	10	
		Sandy Oblonsky	(408)265-2600	11	
		Steve Blake	(408)629-9819	11	
		Kate Slama	(408)265-2607 X2739	11	
	Tudor Study - inboard levees analysis from the 1970's	Bob Teeter		14b	
		Jim Fiedler	(408) 265-2600	14b	
	Habitat Restoration	Louisa Squires	lsquires@valleywater.org 510-336-2172	2, 3	
	Lower Guadalupe River Flood Control Project, fish data			15	
		Phil Bobel	(650)329-2285	11	
Santa Clara/San Jose Regional Wastewater Treatment Facility		Roland Sun	(408)945-5488	11	
South Bayside System Authority (SBSA)		Bob Donaldson	rdonaldson@sbsa.org (650)594-8411 X127	11	
		Jim Bewley	jbewley@sbsa.org (650)594-8411 X124	11	
Sunnyvale Wastewater Treatment Facility	Environmental Specialist	Kristy McCumby	kmccumby@ci.sunnyvale.ca.us (408)730-7274	11	
Union Sanitary District		Jesse Gill	jesse_gill@unionsanitary.com (510)790-0100 X268	11	
Non-Profits					
Bay Area Open Space Council		John Woodbury, Director		15	x
Bay Institute		Grant Davis	http://www.bay.org	1, 2, 3, 4, 7a	
		Marc Holmes			

Source				Topic	GIS/ Mapping Data
Institution	Interest Group	Name	Contact Information		
Bay Planning Coalition (BPC)		Heather Gustafson	heather@bayplanningcoalition.org	12a	
		Ellen Johnck			
Bay Trail (ABAG)	Recreation Data	Janet McBride		7b, 15	
California Waterfowl Association		Bill Gaines		1	
California Invasive Plant Council (CalIPC)		Doug Johnson	510-843-3902	6	
California Native Plant Society (CNPS)		Sally Casey	408-377-0989	6	
California Native Plant Society (CNPS) Santa Clara Chapter		Pam Noick	CNPS@CNPS.com	2, 6	
		Ken Hines	650-591-8560		
Citizens Committee to Complete the Refuge		Florence & Phillip LaRiviere		3	
Clean Estuary Partnership (CEP)	Data sythesis	Andrew Gunther	gunther@amarine.com	8a, 12b	
Clean Water Action/Loma Prieta Sierra Club		Michael Stanley-Jones			
Ducks Unlimited		Greg Green	ggreen@ducks.org	1, 7b	
Golden Gate Audubon	Habitat Restoration	Arthur Feinstein	afeinstein@goldengateaudubon.org 510-843-6551	1	
Green Info Network		Larry Orman, Director; Brian Cohen, GIS Manager		15	x
Invasive Spartina Project (ISP)		Peggy Olofson	prolofson@spartina.org 510-548-2461 x03	1, 6	
		Erik Grijalva	erik@spartina.org	6	x
Marine Science Institute	Aquamarine Research: Fisheries Data	Kate Schafer	650-940-1406 or kateschafer@earthlink.net	1	
National Audobon Society		Michael Sellors			
Ohlone Audubon		Frank and Janice Delfino	510/537-2387	1	
Point Reyes Bird Observatory (PRBO)		Dave Shufford		1, 7a, 7b 7c, 7e, 15	
		Ellie Cohen		7a, 7b, 7c	
		Nils Warnock			
		Nadav Nur			
	Critical areas shorebird maps	Diana Strauberg		2	
Regional Recycle Advocacy Coalition		Jim Stallman			
San Francisco Bay Area Wetlands Restoration Program		John Brosnan, Program Coordinator			x
San Francisco Bay Bird Observatory (SFBBO)		Janet Hansen	jhanson@sfbbo.org	1, 7a, 7b, 7c, 7d, 7e, 8a, 8b, 9	
San Francisco BayKeeper		Leo O'Brien			
San Francisco Estuary Institute (SFEI)			http://www.sfei.org	1, 2, 3, 6	x
		Mike Connor		3, 12c	x
	SF Estuary Regional Monitoring Program	Jay Davis	jay@sfei.org, (510)746-7368	8a, 8b, 12b	
	CALFED Mercury Strategy and Hamilton Air Field Study	Don Yee	donald@sfei.org (510)746-7369	8b	
		Josh Collins	josh@sfei.org (510)746-7334	3, 12c, 15	
		Michael May	mikem@sfei.org (510) 746-7370, (510) 746-7334 main		x
San Francisco Estuary Project		Marcia Brockband, Director	http://www.abag.ca.gov/bayarea/sfep/sfep.html	5, 15	x
San Francisquito Creek Watershed		Phil Chang		15	x
Santa Clara Valley Audubon Society		Craig Brion	408/252-3747	1	
Save the Bay		David Lewis		15	
Sequoia Audubon		Robin Smith	650/369-1093	1	
Sierra Club	Habitat Restoration	Melissa Hippard	melissa.hippard@sierraclub.org 650-390-8411		
South Bay Salt Pond Restoration Project			http://www.southbayrestoration.org/index.html	1	x
The Nature Conservancy (TNC)				6	
Walk San Jose		Gladwyn D'Souza		15	
Wetland Regional Monitoring Program (WRMP)		Mike Vasey		1, 2	
Specialists					
Baye, Peter				2, 6	
Bousman, Bill		NASA retired	barlow@earthlink.net		
Cogswell, Dr. Howard		CSU Hayward Emeritus		15	
Dean Jamieson		Retired SCV Vector Control		13	
Faber, Phyllis			415-388-6002	2, 4	
Gross, Edward	hydrodynamics		510-847-4061, ed.gross@baymodeling.com	5	
Leitner, Phil			pleitner@pacbell.net	1	
Nichols, Frederic	invertrebrates	USGS retired		1	
Padget-Flohr, Gretchen			Gpadgettflohr@aol.com	1	
Rogers, Dr. Mike		NASA retired	mrogers@nas.nasa.gov		
Jerry Smith			408-924-4855		
Indexes					
Biological Abstracts				1, 2, 6, 7	
Wildlife and Ecological Studies Worldwide				1	
Zoological Records				1	

Source				Topic	GIS/ Mapping Data
Data Gaps Workshop Attendees	Title	Company	Contact Information		
Adelsbach, Terry	Contaminants Specialist	FWS	916-414-6600 terry_adelsbach@fws.gov	8	
Akashah, Mey	Marine Biologist	AMS	925-373-7142 akashah@amarine.com	8	
Albertson, Joy	Biologist	San Francisco Bay National Wildlife Refuge	510-792-0222 joy_albertson@fws.gov	1	
Alderete, Christopher	Wildlife Biologist	PAI Corp, consultants to NASA Ames Research Center	(650) 604-3532 calderete@mail.arc.nasa.gov	1	
Armstrong, Louis		URS	510-874-3034 louis.armstrong@urscorp.com		
Athearn, Nicole	Coordinator	USGS	nathearn@usgs.gov		
Bachand, Philip	Principal Engineer/Researcher	Wetlands and Water Resources	530-758-1336 phil@swampthing.org	8	
Benson, Craig	Restoration Biologist	Schaaf and Wheeler	408-246-4848 cbenson@swsv.com	3	
Borchard, Gayle	Consultant	GAIA Consulting, Inc.	510-655-1854 borch1@pacbell.ne	3	
Carpenter, Edward		Romberg Tiburon Center	ecarpent@sfsu.edu	8	
Coats, Robert		Hydroikos Associates	415-482-8173 coats@hydroikos.com		
Cole, Nancy	Director	Moore Foundation	nancy@moore.org		
Counts, James	Field Operations Officer	San Mateo Mosquito Abatement District	(650)344-8592 james@smcmad.org	13	
Daniel, Dick	Project Manager	CH2M Hill	ddaniel@CH2M.com		
Demgen, Francesca	Senior Project Scientist	URS Corp.	510-874-1731francesca_demgen@urscorp.com		
Dreier, Jeff	Associate Wildlife Biologist	Wetlands Research Associates, Inc	415-454-8868 dreier@wra-ca.com	1	
Ervin, Jim		City of San Jose	408-945-5177 james.ervin@ci.sj.ca.us		
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Granholm, Steve		LSA Associates, Inc.	510-236-6810 steve.granholm@lsa-assoc.com		
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Hall, Brad		Northwest Hydraulics	916-371-7400 bhall@nhc-sac.com	14	
Hamersky, William	Environmental Specialist	Alameda County Mosquito Abatement District	510-783-7744 enspec@mosquitoes.org	13	
Hayes, Tim		City of San Jose, Env. Service Dept.	408-277-4346 timothy.hayes@ci.sj.ca.us		
Hosley, Lynne	Wetland Ecologist	CH2M Hill	510-587-7603 lhosley@CH2M.com	8	
Huckelbridge, Kate	Dept. of Civil & Environmental Engineering	UC Berkeley	510-642-3245 katehuck@ce.berkeley.edu		
Huffman, Terry	President	Huffman-Broadway Group	415-925-2000 thuffman@h-bgroup.com		
Hunt, Lisa		URS Corporation	lisa_hunt@urscorp.com	8	
Josselyn , Michael	President	Wetlands Research Associates, Inc	415-454-8868 josselyn@wra-ca.com		
Lesser, Giles		Delft Hydraulics/USGS		5	
Leventhal, Roger	Principal Engineer	FarWest Restoration Engineering	(510) 865-2840 roger@swampthing.org		
MacKay, Kevin		Jones & Stokes	408-434-2244x2206 kmackay@jsanet.com		
Malamud-Roam, Karl		Contra Costa Mosquito and Vector Control District	925-685-9301 x107 kmr@ccmvcd.net	13	
Maurer, Tom	Contaminants Specialist	FWS	916-414-6600 thomas_maurer@fws.gov	8	
McGowan, Michael	Fish Biologist/Ecologist	PAI Corp, consultants to NASA Ames Research Center	mmcgowan@mail.arc.nasa.gov	1	
Miles, Keith	Resarch Biologist	USGS, Western Ecological Research Center	530-7525365 keith_miles@usgs.gov		
Moranz, Ray	Fish & Wildlife Biologist	USFWS	916-414-6600 raymond_moranz@fws.gov	1	
Mulligan, Tim	Manager	S.C.C. Vector	408-792-5101 timothy.mulligan@deh.co.scl.ca.us	13	
Nur, Nadav		Point Reyes Bird Observatory	415-868-1221 nadavnur@prbo.or	1	
Olliges, Sandy		NASA			
Osborn, Steven	Envir. Program Mngr.	City of San Jose	408-945-5303 steven.osborn@ci.sj.ca.us	8	
Parker, Tom	Plant Ecologist	SFSU	parker@sfsu.edu	2	
Porcella, Lisa	Biologist	SCVWD	lporcella@valleywater.org	1	
Rogoff, Dana	Research Associate	NASA AMES Research Center	650-604-3615 drogoff@mail.arc.nasa.gov		
Roy, Sujoy	Principal Engineer	Tetra Tech, Inc.	sujoy@tetratech.com		
Rugg, Mike	CCR	DFG	707-944-5523 mrugg@dfg.ca.gov		

Source				Topic	GIS/ Mapping Data
Data Gaps Workshop Attendees	**Title**	**Company**	**Contact Information**		
Schafer, Kate	Executive Director	Aquamarine Research	650-940-1406 kateschafer@earthlink.net	1	
Schuler, Raymond		NASA	Raymond.F.Schuler@nasa.gov		
Shellenbarger, Greg	Hydrologist	USGS	916-278-3191 gshellen@usgs.gov	10	
Stacey, Mark	Assistant Professor	UCB, Dept of Civil and Environmental Engineering	mstacey@socrates.berkeley.edu		
Stralberg, Diana	GIS Specialist	Point Reyes Bird Observatory	dstralberg@prbo.org	GIS	
Strong, Cheryl	Biologist	SFBBO	cstrong@sfbbo.org	1	
Sullivan, Laurie	Environmental Scientist	NOAA	415-972-3210 laurie.sullivan@noaa.gov		
von Rosenberg, Susanne	Principal	GAIA Consulting, Inc.	(510) 663-4177 Susanne@gaiainc.com		
Wainwright, Susan		USGS			
Warnock, Nils	Wetlands Program Co-Director	Point Reyes Bird Observatory	nilsw@prbo.org	1	

Legend

1 = Wildlife	8a = Physical Distribution of Mercury/Other Contaminants
2 = Vegetation, Plankton	8b = Mercury Methylation
3 = Habitat Landscape Design	9 = Effects of Cargill Operations
4 = Lessons from Prior Restorations	10 = Seasonal Pond/Groundwater Interactions
5 = Hydrodynamics	11 = Infrastructure Assessment
6 = Invasive Species	12a = Imported Sediment Supply and Quality
7a = Wildlife, Human Interactions	12b = In-place Sediment Quality
7b = Species Responses During Restoration	12c = Imported Sediment Characteristics
7c = Predation	13 = Vector Control
7d = Contaminants in Wildlife	14a = Flooding Issues Protection
7e = Food Resources	14b = Levee Conditions
	15 = Recreational Use and Public Access