Baylands Ecosystem

Habitat Goals

A Report of Habitat Recommendations
Prepared by the San Francisco Bay Area
Wetlands Ecosystem Goals Project

Db	Deep Bay/Channel
Sb	Shallow Bay/Channel
Tf	Tidal Flat
Tm	Tidal Marsh
Tp	Tidal Marsh Pan
Lg	Lagoon
Bc	Beach/Dune
Ag	Agricultural Bayland
Dw	Diked Wetland
Sp	Salt Pond
St	Storage or Treatment Pond
Uf	Undeveloped Bay Fill
Df	Developed Bay Fill
Pr	Perennial Pond
Rw	Riparian Forest/Willow Grove
Mg	Moist Grassland
Gr	Grassland/Vernal Pool Complex

Legend for Baylands Segment Maps, Chapter Five

For descriptions of each habitat type, please see Chapter Four.

Basic Baylands Facts

The baylands exist around the Bay between the lines of high and low tide. They are the lands touched by the tides, plus the lands that the tides would touch in the absence of any levees or other unnatural structures.

There are 73,000 acres of tidal baylands and 139,000 acres of diked baylands.

There used to be 23 miles of sandy beaches. Now there are about seven miles of beaches. Most of the present beaches occur in different locations than the historical beaches.

There used to be 190,000 acres of tidal marsh with 6,000 miles of channels and 8,000 acres of shallow pans. Now there are 40,000 acres of tidal marsh with about 1,000 miles of channels and 250 acres of pans.

Only 16,000 acres of the historical tidal marsh remain. The rest of the present tidal marsh has naturally evolved from tidal flat, been restored from diked baylands, or muted by water control structures.

There used to be 50,000 acres of tidal flat. Now there are 29,000 acres of tidal flat. The reduction is due to bay fill, erosion, and tidal marsh evolution.

There used to be about 174,000 acres of shallow bay and 100,000 acres of deep bay. Now there are 172,000 acres of shallow bay and 82,000 acres of deep bay. About 16,000 acres of deep bay have become shallow and 18,000 acres of shallow bay have become tidal, diked, or filled baylands.

The total area of high tide downstream of the Delta used to be about 516,000 acres. Now it is about 327,000 acres.

The total amount of shallow ponds in the baylands and in the adjacent grasslands used to range from about 16,000 acres to 22,000 acres, depending on the amount of rainfall. Now there are between 63,000 and 92,000 acres, depending on rainfall and water management practices. The increase is due to ponding in diked baylands.

137,000 acres of baylands have been diked.

50,000 acres of baylands have been filled.

There are about 500 species of fish and wildlife associated with the baylands. Twenty of these species are threatened or endangered with extinction.

Seven million people live around the baylands.

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Please note that news about this Report will be posted periodically on SFEI's website at www.sfei.org.

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San Francisco Estuary Project
c/o S.F. Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612
(510) 622 – 2465

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LUNA B. LEOPOLD
Consulting Engineer

400 VERMONT AVENUE
BERKELEY, CALIFORNIA 94707
(510) 527-7046
FAX (510) 527-7046

COTTONWOOD ON THE NEW FORK
BOX 1040
PINEDALE, WYOMING 82941
(307) 367-4762
FAX (307) 367-4762

March 1, 1999

Mike Monroe, Co-Chair
Carl Wilcox, Co-Chair
Resource Managers Group
San Francisco Bay Area Wetlands Ecosystem Goals Project

Dear Misters Monroe and Wilcox:

A Science Review Group was drawn to advise the Wetlands Ecosystem Goals Project on scientific questions of procedure and to look at the project reports. The advisors met as a group once over a two-day period, about midway through the project, and since then we have responded individually and collectively to your occasional requests for advice. This letter constitutes our final review of the goals project. An early draft of this letter was sent to the advisors, and the present text incorporates selected portions of their comments.

At its original meeting and through subsequent correspondence, the Science Review Group was asked to consider a variety of topics, such as project organization and supervision, in addition to science. We felt that, because many agencies were involved, the project's organization and supervision were outside the scope of our review. However, we made several suggestions to help improve the process. As advised, the project leaders developed a set of guiding principles, extended the project timeline to allow the technical teams more time to complete their work, and activated the team for hydrology and geomorphology.

There were two central scientific questions which we deliberated: whether selected species should be used to indicate habitat conservation goals, and whether the goals should be recorded on maps.

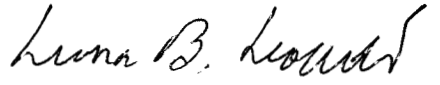
With regard to the question about species-based habitat goals, we did not reach complete agreement. One issue was whether species' present or past distributions could be used to prescribe future habitats as goals toward which change might be directed. Furthermore, since not all of the 500 or so candidate species, large or small, could be individually considered, there was concern that a selected list might not represent the whole system. Our scientific assessment of this species-based approach was influenced by the obvious fact that a great deal of knowledge of the various species was in the minds and the records of many local experts. This mass of knowledge could be organized by enlisting the help of the large population of experienced people. It was also recognized that the expert consideration of representative species would likely lead to a view of habitat and hence to the more important topic of habitat evolution and maintenance. This in fact is the procedure that evolved. With some misgivings, the Science Advisors endorsed the idea of using species as the most practical indicators.

With regard to the question about maps, we found more agreement. We found it logical to use maps to quantify and to illustrate the habitat goals. A matter of scientific concern was the appropriate detail and accuracy of the maps to be used, and how they would be combined. This was resolved by the participants in the project, who judged the maps produced for the project to be of sufficient quality to inform their scientific discourse and quantify their recommendations. At the end of this long process, all the technical teams worked together on the final maps of the habitat goals, which therefore satisfied the need for integration among the recommendations from all the teams.

Use of the final maps to illustrate and present the goals became subject to two related concerns: the specificity of the maps relative to the quality of the data, and how to show their specificity without raising public ire. As for the concern about data quality, the advisors concluded that the dozens of technical people compiling the data had in their collective experience the best source and that their information was the best available. As for the political concern, the advisors felt that the criterion should be the most logical and understandable method of presentation, not the matter of whether some landowners will object to having their property included in a map, or whether some agencies will be challenged by the scientific findings.

The Goals Project and the extensive work done was a meeting between environmental science and management. The report of this combined effort is not purely scientific. The next steps of implementation must involve monitoring as well as research. The collection of data in the monitoring process will also be a combination of management and science, for the avowed end is improvement of ecosystem health through management.

Based on our review of the draft and final reports, we believe that the Goals Project has established a reasonable, scientific basis for restoration of the baylands ecosystem. However, we caution against any large effort to achieve the goals that is not supported by a program of research and monitoring that can explain failure or success.



Luna B. Leopold
Chair, Science Review Group
Wetlands Ecosystem Goals Project

CREDITS

Lead Authors / Editors

Michael Monroe — Project Co-Chair/Environmental Scientist, U.S. Environmental Protection Agency

Peggy R. Olofson — Project Manager/Environmental Engineer, San Francisco Bay Regional Water Quality Control Board

Contributing Authors

Joshua N. Collins — Environmental Scientist, San Francisco Estuary Institute

Robin Grossinger — Assistant Environmental Scientist, San Francisco Estuary Institute

Jeff Haltiner — Hydrologist, Philip Williams and Associates

Carl Wilcox — Project Co-Chair/Wildlife Biologist, California Department of Fish and Game

Geographic Information System Staff

Zoltan Der
Christina Wong

Science Coordinators

Joshua N. Collins
Robin Grossinger

Report Production Staff

Elise Brewster, design arts
Zoltan Der, graphics
Cristina Grosso, copy editing
Nina Lisowski, report & cover design
Michael May, graphics
Neil Wehrlie, copy editing
Christina Wong, graphics
Adrienne Yang, layout, design, & graphics

Technical Advice and Assistance

This report was made possible by the hard work of the nearly 100 Project participants listed on pages v – viii. Many of these individuals worked on the Project on their personal time. Members of the Resource Managers Group, and particularly the focus team leaders, collectively contributed thousands of hours of time.

Several Project participants were especially helpful in providing information and technical expertise for the production of this report. They include Peter Baye, Dennis Becker, Howard Cogswell, Glen Holstein, Paul Jones, Wes Maffei, Karl Malamud-Roam, Howard Shellhammer, and Jim Swanson. Several technicians assisted the focus teams for extended periods of time, including Janice Alexander, David Casady, Joan Goodmundson, Laura Hanson, Catherine Hickey, Thomas Ryan, and Feride Serifidden.

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We appreciate the use of photographs provided by Herb Lingl/Aerial Archives (415-771-2555, herb@aerialarchives.com).

EcoAtlas

The EcoAtlas is a regional GIS (Geographic Information System) for Bay Area ecological resources which was used to support the development of the Goals. Numerous people contributed to the development of the EcoAtlas. Josh Collins and Robin Grossinger supervised the integration of scientific information. Zoltan Der directed GIS operations. Christina Wong did GIS and related technical work. Elise Brewster did historical research and cartography. Technical assistance was provided by Ted Daum, Todd Featherston, and Jung Yoon. Especially deserving of credit are the more than 200 local volunteers who contributed over 10,000 hours of volunteer time to the project. Without their talent and dedication, the detail and accuracy of the EcoAtlas would not be possible.

These interns and their area of focus were: Ann Baker, Alameda County; Katie Bickell, Spanish land grant cases and red-legged frog industry; Margot Cunningham, Contra Costa and Alameda counties and data management; Zoltan Der, San Mateo County and data management; Spence Everson, Santa Clara County; Arlie Haig, GIS development; Corrine Humphrey, data management; Maggie Hynes, Marin County; Ellie Insley, Sonoma County; Rebecca Johnson, Spanish land grant cases; Steve Jones, Contra Costa County; Alan Kaplan, Solano County; Isaac Shukima, Spanish documents; Katy Suttorp, native land-use and freshwater influences on tidal marsh; and Dennis Worrell, early soil surveys.

Additional contributions were made by: Linda Barber, Robert Mendez, Todd Barber, Phil Mittenberg, Deborah Carol, Tom Radulovich, Emily Cheng, Leslie Stansfield, Julie Eckstrom, Carrie Steenwerth, Skip Hunter, Andrea Subotic, Stacy McGihan, and Nandini Venkatesh.

Draft Report Comments

A draft of this report was distributed to 550 people, and it was made available on the Internet. In addition to comments from Project participants, comments from the following reviewers helped to clarify issues and to improve the final report: Rosemary Alex, Anthony Arnold, Linda Bagneschi, James Bancroft, Ron Barclow, Viola Barclow, Bill Bisso, Bill Bousman, John Bowers, Bill Britt, Wil Burns, John Callaway, Paul Campos, Mike Casazza, Dave Cavanaugh, Terrance Connolly, Bill Coon, Jerry Corda, Paul Crappuchettes, Carole D'Alessio, Norbert Dall, Ron Davis, Frank Delfino, Janice Delfino, Francesca Demgen, Don Dickenson, Suzanne Eastridge, Timothy Egan, Steve Engle, Arthur Feinstein, Harvey Goldberg, Julie Grantz, Sandra Guldman, Jim Haire, Catherine Hayes, Myrna Hayes, Stana Hearne, Totten Hefflefinger, Larry Johmann, Ellen Johnck, Frank Johnson, Mike Josselyn, Sheila Junge, Bruce Kern, Donald Kibby, Lee Lehman, Arnold Lenk, Clyde Low, Jean Matsuura, James McGrath, Gavin McHugh, Jim McKinney, Sunne McPeak, Janet Meth, Mike Miller, Evan Monroe, Frank Morris, Trish Mulvey, Ralph Nobles, Arvid Olson, Brad Olson, Kay Olson, Rick Parmer, Phil Peterson, Jim Reese, Richard Rodagondo, Brian Ross, Barbara Salzman, Jacqueline Schafer, Paul Shepherd, Jill Singleton, Jim Stark, Dwight Steele, Leonard Stefanelli, Ann Thomas, Will Travis, Mike Vassey, Bill Walter, Doug Wheeler, Wayne White, Kirk Willard, Roderick Wood, and William Wright.

Please forgive any unintentional omissions.

PARTICIPANTS

Resource Managers Group

Bob Batha
S.F. Bay Conservation and Development Commission

Dennis Becker
California Department of Fish and Game

Andree Breaux
S.F. Bay Regional Water Quality Control Board

Joelle Buffa
U.S. Fish and Wildlife Service

Dan Cheng
National Marine Fisheries Service

Melanie Denninger
California Coastal Conservancy

Brenda Grewell
California Department of Water Resources

Nadine Hitchock
California Coastal Conservancy

Dante Maragni
National Marine Fisheries Service

Michael Monroe, Co-Chair
U.S. Environmental Protection Agency

Ruth Pratt
U.S. Fish and Wildlife Service

Betsy Radtke
U.S. Fish and Wildlife Service

Jim Swanson
California Department of Fish and Game

Bob Tasto
California Department of Fish and Game

Frank Wernette
California Department of Fish and Game

Carl Wilcox, Co-Chair
California Department of Fish and Game

Administrative Core Team

Jeff Blanchfield
S.F. Bay Conservation and Development Commission

Marcia Brockbank
San Francisco Estuary Project

Josh Collins
San Francisco Estuary Institute

Craig Denisoff
California Resources Agency

Paul Jones
U.S. Environmental Protection Agency

Michael Monroe
U.S. Environmental Protection Agency

Peggy Olofson
S.F. Bay Regional Water Quality Control Board

Nancy Schaefer
San Francisco Bay Joint Venture

Carl Wilcox
California Department of Fish and Game

Plants Focus Team

Peter Baye
U.S. Fish and Wildlife Service

Phyllis Faber

Brenda Grewell, Co-Leader
California Department of Water Resources

Laura Hanson

Glen Holstein
Zentner and Zentner Associates

Wes Maffei, Co-Leader
Napa County Mosquito Abatement District

Lorraine Parsons
Sonoma County Water Agency

Gale Rankin
Santa Clara Valley Water District

Betty Warne
U.S. Fish and Wildlife Service

Fish Focus Team

Dan Cheng
National Marine Fisheries Services

Holly Ganz
University of California, Davis

Susan Hatfield
U.S. Environmental Protection Agency

Bruce Herbold
U.S. Environmental Protection Agency

Kathy Hieb
California Department of Fish and Game

William Kier
William Kier Associates

Kurt Kline
Advanced Biological Testing

Robert Leidy
U.S. Environmental Protection Agency

Dante Maragni
National Marine Fisheries Services

Michael McGowan
Tiburon Center for Environmental Studies

Mike Saiki
U.S. Fish and Wildlife Service

Ted Sommer
California Department of Water Resources

Bob Tasto, Leader
California Department of Fish and Game

Frank Wernette
California Department of Fish and Game

Mammals, Amphibians, Reptiles and Invertebrates Focus Team

David Ainley
H. T. Harvey and Associates

Fred Botti
California Department of Fish and Game

Andree Breaux, Leader
S.F. Bay Regional Water Quality Control Board

Roger Crawford
San Francisco State University

Joe Didonato
East Bay Regional Park District

Ron Duke
H.T. Harvey and Associates

Steve Foreman
LSA Associates, Incorporated

Elaine Harding-Smith
University of California, Santa Cruz

Mark Jennings
U.S. Geological Survey

Mike Johnson
University of California, Davis

Brita Larsson
San Francisco State University

Kirk Lenington
Levine-Fricke-Rincon, Incorporated

William Lidicker
University of California, Berkeley

Wes Maffei
Napa County Mosquito Abatement District

Karl Malamud-Roam
Contra Costa County Mosquito and Vector Control

Kevin McKay
Jones and Stokes Associates

Doug Padley
Santa Clara Valley Water District

Vince Resh
University of California, Berkeley

Howard Shellhammer
San Jose State University

Pete Sorenson
U.S. Fish and Wildlife Service

Laureen Thompson
California Department of Fish and Game

Mike Westphal
Coyote Creek Riparian Station

Shorebirds And Waterfowl Focus Team

Janice Alexander

Dennis Becker, Co-Leader
California Department of Fish and Game

Mike Casazza
Ducks Unlimited

Steve Chappell
Suisun Resource Conservation District

Stephen Granholm
LSA Associates, Incorporated

Janet Hanson
San Francisco Bay Bird Observatory

Catherine Hickey
Point Reyes Bird Observatory

Carolyn Marn
Oregon State University

Keith Miles
U.S. Geological Survey

Gary Page
Point Reyes Bird Observatory

Ruth Pratt
U.S. Fish and Wildlife Service

John Takekawa, Co-Leader
U.S. Geological Survey

Nils Warnock
Point Reyes Bird Observatory

Sarah Warnock
Oregon State University

Other Baylands Birds Focus Team

David Ainley
H.T. Harvey and Associates

Joy Albertson
U.S. Fish and Wildlife Service

Bob Batha
S.F. Bay Conservation and Development Commission

Bill Bousman

Howard Cogswell
California State University, Hayward

Dan Evans
Point Reyes Bird Observatory

Jules Evens
Avocet Research

Leora Feeney

Valerie Layne
Alameda County Department of Public Works

Mike Rigney
Coyote Creek Riparian Station

Tom Ryan
San Francisco Bay Bird Observatory

Scott Terrill
H. T. Harvey and Associates

Lynne Trulio
San Jose State University

Carl Wilcox, Leader
California Department of Fish and Game

Hydrogeomorphic Advisory Team

Andree Breaux, Co-Coordinator
S.F. Bay Regional Water Quality Control Board

Roger Byrne
University of California, Berkeley

John Callaway
San Diego State University

Josh Collins, Co-Coordinator
San Francisco Estuary Institute

Jeff Haltiner
Philip Williams and Associates, Ltd.

Ray Krone
University of California, Davis

Doug Lipton
Levine-Fricke-Rincon, Incorporated

Fred Nichols
U.S. Geological Survey

Nigel Quinn
U.S. Bureau of Reclamation

David Schoelhammer
U.S. Geological Survey

Stuart Siegel
Wetlands and Water Resources

Richard Smith
U.S. Geological Survey

Science Review Group

Steven Beissinger
University of California, Berkeley

Theodore Foin
University of California, Davis

David Hulse
University of Oregon

Luna Leopold
University of California, Berkeley

Charles Simenstad
University of Washington

Joy Zedler
University of Wisconsin

PREFACE

This report presents the findings of the San Francisco Bay Area Wetlands Ecosystem Goals Project. It is intended to be a guide for restoring and improving the baylands and adjacent habitats of the San Francisco Estuary.

Scientists and resource managers developed the Goals Project's recommendations, but this report has been written for the public rather than for a scientific or technical audience. This report is to be used in conjunction with another Goals Project document, entitled *Species and Community Profiles*, which provides background information on many of the animal species and plant communities of the Project area. The reader may request a copy of that document from the San Francisco Estuary Project.

During the development of the Goals, the Project's Resource Managers Group solicited public input on many occasions. In summer 1998, the public provided verbal and written comments on a draft Goals report. The Resource Managers Group reviewed all of these comments and made every effort to address them appropriately in this final report. The following items provide additional information on the main issues of concern.

- The maps in this report are meant to inform the reader about past and present habitat conditions in and adjacent to the baylands. The map in Appendix E shows one way, among many possibilities, that habitats might be arranged in order to implement the Project recommendations. These maps do not indicate the jurisdictional limits of wetlands, and they should not be used for regulatory purposes.
- Many local, state, and federal agencies were involved in the Goals Project. This does not imply that these agencies concur with each and every recommendation in this report or that they will take all of the actions necessary to implement the recommendations.
- The Project focused on the baylands, but there are many other areas in the region that are biologically important and which could benefit from some kind of an effort to develop habitat goals. The Project's emphasis on the baylands does not mean that these other areas are not in need of improvement and better protection.

- The habitat recommendations in this report are meant to be implemented voluntarily, incrementally, and cautiously in the coming decades. They encourage habitat improvement projects of many different sizes and with many different purposes.
- Project participants sought to develop habitat recommendations based primarily on ecology and physical science. In this way, they attempted to provide for the needs of fish and wildlife, even though certain considerations — economic constraints, landowner desires, zoning, and societal interests — might make it difficult or impossible to implement some recommendations. Restoration projects will need to analyze these considerations during initial planning phases.
- This report is not an environmental impact statement or an environmental impact report intended to meet requirements of the National Environmental Policy Act or the California Environmental Quality Act. Any project that proposes to implement the Project recommendations will need to undergo appropriate environmental impact analysis.

In spite of an extensive outreach effort, some members of the public, particularly rural landowners, indicated that they were unaware of the Goals Project until the release of the draft Goals report. Any efforts to revisit and update the Goals in the coming years should include better outreach to landowners.

Making the habitat changes envisioned in this report will require a better scientific understanding of bayland processes and of the effects of habitat conversion. It also will necessitate closer coordination among many public and private interests. These needs can best be met through the development of a regional wetlands plan. This Goals report and other appropriate documents should form the basis of such a plan.

The Resource Managers Group invites the citizens of the Bay Area to read this report and to develop an understanding of the habitat changes needed to ensure a healthy baylands ecosystem. Above all, we encourage everyone who will be involved in transforming the baylands to work together in a creative and cooperative fashion. The coming decades should be an exciting time in which the baylands are restored and enhanced in a way that benefits everyone in the region.

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SUMMARY

This report presents recommendations for the kinds, amounts, and distribution of wetlands and related habitats that are needed to sustain diverse and healthy communities of fish and wildlife resources in the San Francisco Bay Area. It represents the culmination of more than three years of work by scientists, resource managers, and other participants of the San Francisco Bay Area Wetlands Ecosystem Goals Project (Goals Project).

The geographic scope of the Goals Project included portions of the San Francisco Estuary that are downstream of the Sacramento-San Joaquin Delta. These include Suisun Bay, San Pablo Bay, and San Francisco Bay. Within this area, Project participants focused their attention on the baylands — the lands within the historical and modern boundaries of the tides — and adjacent areas.

The San Francisco Estuary Project identified a need for habitat goals in 1993. Subsequent discussions among representatives of fish and wildlife agencies confirmed this need. The Goals Project began in 1995 and involved more than 100 participants representing local, state, and federal agencies, academia, and the private sector. Participants were organized in several groups, each of which had a unique role in developing the Goals. The Resource Managers Group, composed of representatives of state and federal resource agencies, oversaw the Project and was ultimately responsible for the content and format of the Goals.

Developing the Goals

The process for developing the Goals involved several steps. These included selecting key species and key habitats, assembling and evaluating information, preparing recommendations, and integrating recommendations into Goals. The Resource Managers Group decided to develop goals based on species needs because there was relatively abundant information available on bayland species and habitats. There was general agreement that goals developed to improve habitats for many kinds of plants and animals would concurrently provide other important wetlands services, such as nutrient cycling, flood control, and water quality improvement.

In selecting key species of the baylands ecosystem, technical focus teams screened nearly 400 species of fish and wildlife and evaluated plant communities

from the Bay to the adjacent uplands. The focus teams ultimately selected 120 species of invertebrates, fish, amphibians, reptiles, mammals, and birds to represent the complexity of the baylands ecosystem.

In developing the list of key habitats, Project participants reviewed habitat lists created for previous wetland planning efforts. Ultimately, they designated some two dozen key habitats of the baylands ecosystem. Most of the habitat designations had been commonly used in the region for years; however, some were unique to the Project.

After selecting key species and habitats, Project participants assembled qualitative and quantitative data on them and prepared initial habitat recommendations. These recommendations were integrated into a draft report that was circulated for public comment. This final report is based on the draft report, on verbal and written public comments submitted on the draft report, and on new information.

Habitat Goals

The Goals are presented at three levels of specificity — by region, by subregion, and by segment. The regional and subregional recommendations are fairly general and are summarized below. The segment recommendations are more detailed and are provided in the main body of the report.

The Goals recommendations are founded on one important premise:

> There should be no additional loss of wetlands within the baylands ecosystem. Furthermore, as filled or developed areas within the baylands become available, their potential for restoration to fish and wildlife habitat should be fully considered.

Regional Recommendations

The Goals recommend major habitat changes region-wide. They call for:

- Many large patches of tidal marsh connected by corridors to enable the movement of small mammals and marsh-dependent birds.
- Several large complexes of salt ponds managed for shorebirds and waterfowl.
- Extensive areas of managed seasonal ponds.
- Large expanses of managed marsh.
- Continuous corridors of riparian vegetation along the Bay's tributary streams.
- Restored beaches, natural salt ponds, and other unique habitats.
- Intact patches of adjacent habitats, including grasslands, seasonal wetlands, and forests.

This regional perspective embodies several ecological design principles which state that bayland restoration plans should:

- Center tidal marsh restoration, where possible, around existing populations of threatened and endangered species.
- Include restoration of tidal marsh along the salinity gradients of the Estuary and its tributaries.

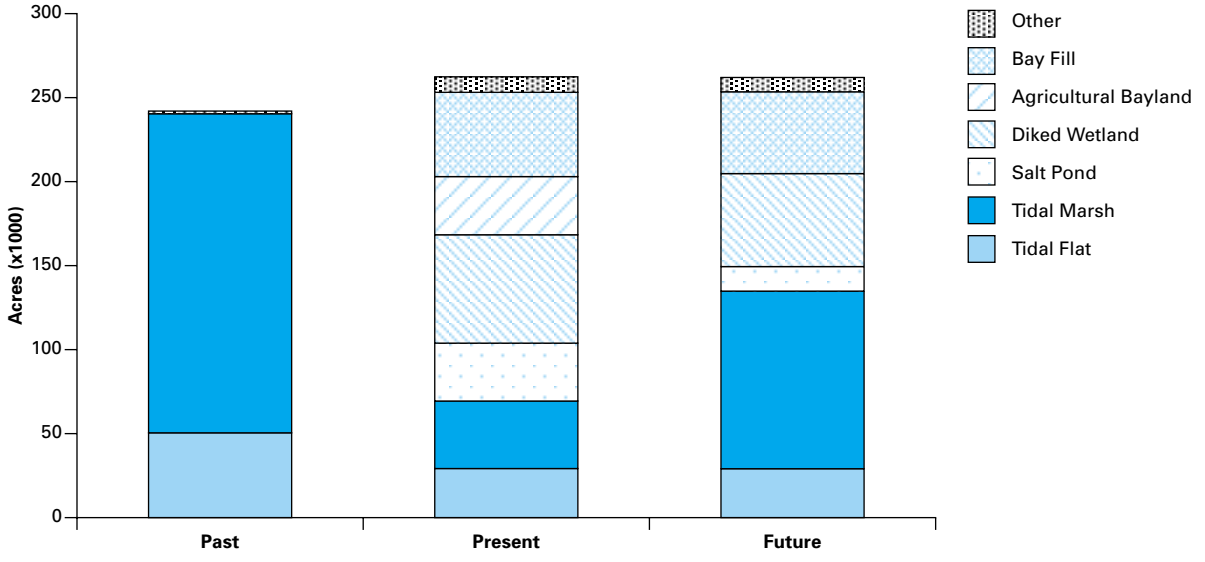
- Emphasize restoring tidal marsh along the Bay edge and where streams enter the baylands.
- Provide natural features, such as pans and large tidal channels, within tidal marshes.
- Reestablish natural transitions from tidal flat through tidal marsh to upland, and between diked wetlands and adjacent uplands.
- Provide buffers on undeveloped adjacent lands to protect habitats from disturbance.

The figure below shows the approximate regional acreage goals for the key bayland habitats. For perspective, it presents the Goals alongside graphs of past and present habitat acreage. Please keep in mind that these recommended changes should occur gradually over a period of several decades.

As the figure shows, restoring large areas of tidal marsh will reduce the acreage of some other habitats, especially salt pond, agricultural bayland, and managed marsh — each of which currently provide habitat for many species. These losses should be offset in the following ways:

- To offset the conversion of salt pond habitat, the remaining salt ponds should be managed to maximize wildlife habitat functions, particularly for shorebirds, waterfowl, and other water birds. There should be salt pond complexes in North Bay and in South Bay adjacent to important shorebird foraging areas. Each complex should be managed to maintain a range of salinities and water depths that favor the desired bird species.
- To offset the conversion of agricultural bayland habitat, the remaining agricultural areas should be managed as seasonal pond habitat to improve habitat functions for shorebirds, waterfowl, and other water birds.

Past, Present, and Recommended Future Bayland Habitat Acreage for the Region



- To offset the conversion of managed marsh habitat, the remaining managed marshes should be managed to increase their waterfowl habitat functions.

Although the Goals recommend reducing the acreage of some key habitat types in most of the subregions, they call for increasing the region's overall ability to support a full range of fish and wildlife. In essence, the Goals shift some of the functions of managed habitats from one subregion to another.

Subregional Recommendations

The subregional recommendations are more specific than the regional recommendations, but they are still fairly general. They are described here, and the subregional habitat acreage goals are presented in the main body of the report.

Suisun Subregion

The overall goal for the Suisun subregion is to restore tidal marsh on the northern and southern sides of Suisun Bay, Grizzly Bay, and Honker Bay, and to restore and enhance managed marsh, riparian forest, grassland, and other habitats.

In Suisun Marsh, tidal marsh should be restored in a continuous band from the confluence of Montezuma Slough and the Sacramento/San Joaquin rivers to the Marsh's western edge. This band of tidal marsh should extend in an arc around the northern edge of the Marsh and should blend naturally with the adjacent grasslands to provide maximum diversity of the upland ecotone, especially for plant communities. A broad band of tidal marsh also should be restored along the southern edge of Suisun Marsh and around Honker Bay, in large part to improve fish habitat.

On the majority of lands within Suisun Marsh, the long-standing practice of managing diked wetlands primarily for waterfowl should continue. These brackish marshes should be enhanced, through protective management practices, to increase their ability to support waterfowl. On the periphery of the Marsh, moist grasslands with vernal pools should be enhanced, as should riparian vegetation along the tributary streams.

On the Contra Costa shoreline, full tidal action should be restored to many of the marshes that currently are diked or that receive muted tidal flow. Restoration should incorporate broad transition zones to foster a higher diversity of plant communities and associated animals. It also should provide buffers to protect these populations from adjacent disturbance. Riparian vegetation should be restored along as many stream corridors as possible.

In the northern part of this subregion, achieving the Goals will depend largely on the willingness of private duck club owners to convert managed marsh to tidal marsh. On the Contra Costa shoreline, achieving them will depend on the willingness of public and private landowners to restore many marshes to full tidal action.

North Bay Subregion

The overall goal for the North Bay subregion is to restore large areas of tidal marsh and to enhance seasonal wetlands. Some of the inactive salt ponds should be

managed to maximize their habitat functions for shorebirds and waterfowl, and others should be restored to tidal marsh. Tributary streams and riparian vegetation should be protected and enhanced, and shallow subtidal habitats (including eelgrass beds in the southern extent of this subregion) should be preserved or restored.

Tidal marsh restoration should occur in a band along the bayshore, extending well into the watersheds of the subregion's three major tributaries — Napa River, Sonoma Creek, and Petaluma River. Seasonal wetlands should be improved in the areas that currently are managed as agricultural baylands. All remaining seasonal wetlands in the uplands adjacent to the baylands should be protected and enhanced.

In much of this subregion, achieving the Goals will depend on the willingness of farmers to convert agricultural baylands to tidal marsh and to allow the remaining areas to be managed as seasonal pond habitat.

Central Bay Subregion

The overall goal for the Central Bay subregion is to protect and restore tidal marsh, seasonal wetlands, beach dunes, and islands. Natural salt ponds should be restored on the East Bay shoreline. Shallow subtidal habitats (including eelgrass beds) should be protected and enhanced. Tributary streams and riparian habitats should be protected and enhanced.

Tidal marshes should be restored wherever possible, particularly at locations that abut streams and at the upper reaches of dead-end sloughs. Tidal marsh restoration in urban areas is encouraged.

Although topography and urban and industrial development limit the potential for large-scale habitat restoration in this subregion, there are many opportunities to restore relatively small tidal marshes and other habitats, and these should be pursued. Even small, disconnected patches of tidal marsh would provide habitat islands for migrating native wildlife species and improve overall habitat conditions. Even the smallest restoration efforts should try to incorporate transitions from intertidal habitats to adjacent uplands, as well as upland buffers. Shorebird roosting sites should be protected and enhanced.

In this subregion, achieving the Goals will depend largely on the willingness of many private and public landowners to undertake habitat restoration and enhancement in the most urbanized portion of the baylands.

South Bay Subregion

The overall goal in the South Bay subregion is to restore large areas of tidal marsh connected by wide corridors of similar habitat along the perimeter of the Bay. Several large complexes of salt ponds, managed to optimize shorebird and waterfowl habitat functions, should be interspersed throughout the subregion, and naturalistic, unmanaged salt ponds should be restored on the East Bay shoreline. There should be natural transitions from mudflat through tidal marsh to adjacent uplands, wherever possible. Adjacent moist grasslands, particularly those with vernal pools, should be protected and improved for wildlife. Riparian vegetation and willow groves should be protected and restored wherever possible.

In this subregion, achieving the Goals will depend largely on the willingness of the Cargill Salt Division to undertake major changes in its operations. It also will depend on the efforts of many other private and public landowners.

Restoration Benefits

Achieving the Goals region-wide would have major environmental benefits. A primary anticipated benefit would be the recovery of the baylands' many threatened and endangered species. For example, restoring large areas of tidal marsh would enable populations of salt marsh harvest mouse and California clapper rail to rebound, eliminating the need for their current special protection. Likewise, restoring tidal marsh would improve habitat conditions for the endangered Chinook salmon and the threatened Delta smelt.

Restoring large amounts of tidal marsh would improve the Bay's natural filtering system and enhance water quality, increase primary productivity of the aquatic ecosystem, and reduce the need for flood control and channel dredging.

Enhancing diked wetlands would increase the regional and subregional support of migratory birds. Restoring vernal pools and other seasonal wetlands would reverse declines of unique plant and animal communities. Restoring riparian corridors would benefit many species of amphibians, mammals, and birds.

Implementing the Goals Recommendations

Several issues influence the implementation of the recommendations in this report. These include large-scale physical factors, such as sea level rise and sediment supply and deposition, as well as more site-specific design and management considerations.

Restoring the baylands also will require addressing a variety of complicated technical and policy issues, including:

- Phasing of projects so that the habitat functions of diked baylands — especially seasonal wetlands, salt ponds, and managed marsh — are provided when tidal marsh is restored.
- Determining how and when to use dredged material for tidal marsh restoration.
- Balancing the need for public access with the needs of bayland wildlife.
- Controlling non-native invasive plants and introduced animal species.
- Ensuring adequate funding to acquire, restore, and manage bayland habitats in the long term.

Science Needs

There has been considerable scientific information compiled about the Estuary and the baylands in the past decades. Increased information promotes a better understanding of this complex environment and will help improve habitat design and management. However, even with all of the information that is available, there is still a need for more.

The Resource Managers Group warned that there is a significant ecological risk in undertaking region-wide bayland restoration efforts without an adequate program of science support. Appropriate steps should be taken immediately to establish a regional science program to support the management of the baylands ecosystem. The initial emphasis should be placed on making existing and new information more available for those who can use it to improve restoration

planning, design, and management decisions. Local scientists and other experts should develop the baylands science program. The Estuary Institute should coordinate the effort as part of the Regional Monitoring Strategy. Local, state, and federal agencies and others should participate in developing and implementing the program.

Next Steps

The Goals establish a flexible vision for restoring bayland habitats. Because they are not a blueprint of specific projects, implementing the Goals recommendations will require close coordination among landowners, agencies, and others. Accordingly, the RMG recommended that the agencies and the public work together to develop an appropriate process for implementing the Goals. This process should seek to ensure better coordination, identify appropriate research and monitoring, and improve agency policies and procedures.

The Estuary Project's *Comprehensive Conservation and Management Plan* designates the California Resources Agency as the lead agency for developing a regional wetlands plan. The Resources Agency agreed to work with the Bay Area Wetlands Planning Group in developing this plan. This past winter, group members drafted a general scope for this effort. The tasks in the draft scope include forming a stakeholder committee, holding technical workshops, preparing a draft plan, seeking public comments on the draft plan, and preparing a final plan. The stakeholder committee will include landowners, business interests, environmental groups, and local governments. Initial stakeholder meetings are scheduled to begin in mid-1999, and developing the wetland plan is expected to take six to twelve months.