HUMBOLDT BAY MANAGEMENT PLAN

Volume I
The Plan

May 2007

Humboldt Bay 2005

Humboldt Bay Management Plan

Humboldt Bay Harbor, Recreation and Conservation District

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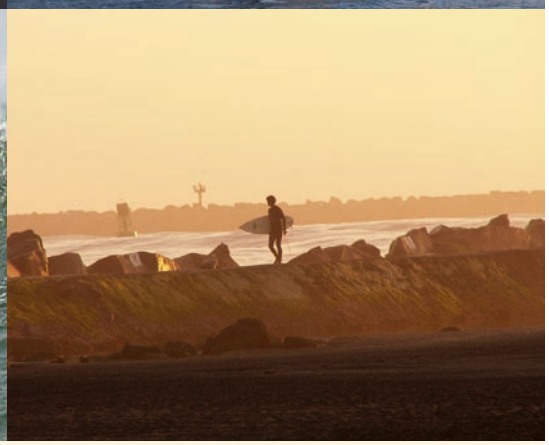
May 2007









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Our appreciation to Bug Press for their contribution to this undertaking.

Humboldt Bay Management Plan

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Executive Summary

Humboldt Bay Management Plan

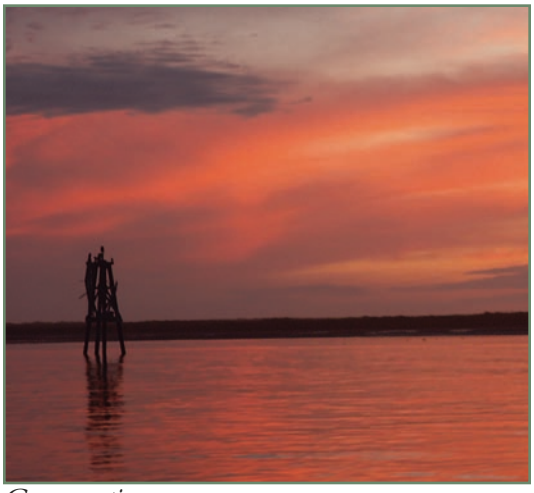
May 2007

1.0 INTRODUCTION

As California's second largest natural bay, Humboldt Bay (Figure ES-1) is a complex ecosystem and valuable resource for California and the nation because of its natural and environmental resources, its aesthetic appeal and recreational opportunities, its ecological services, economic benefits, and its vital transportation links. Visitors and Humboldt County residents alike value Humboldt Bay for its natural and man-made attributes.

Recreation

Because there is a need to balance port-related commercial and industrial uses, expanding recreational uses, and environmental protection, a planning document for Humboldt Bay was deemed necessary by the Humboldt Bay Harbor, Recreation and Conservation District (District). The District considered that this planning document should consider population growth, existing uses in the bay, the best natural and environmental resource and physical information available, and the best understanding that could be mustered regarding potential future needs in both the biological and human environment, and should involve appropriate agency land managers and user-group stakeholders. This planning document, and the effort is embodied in its creation, is the Humboldt Bay Management Plan and represents the region's first ecosystem-based management approach intended to improve the management of Humboldt Bay.



Conservation

2.0 THE HUMBOLDT BAY HARBOR, RECREATION AND CONSERVATION DISTRICT

In order to efficiently balance the variety of uses in Humboldt Bay, the State of California established the Humboldt Bay Harbor, Recreation and Conservation District (District) in 1970. The enabling legislation may be found in the California Harbors and Navigation Code, Appendix II.

Harbor

The statutory purpose of the District is to manage Humboldt Bay for the promotion of commerce, navigation, fisheries, recreation, and the protection of natural resources, and to acquire, construct, maintain, operate, develop, and regulate harbor works. The important point in this statement of purposes is the balance among potentially

conflicting uses of Humboldt Bay, which the District continually strives to achieve, and which the Humboldt Bay Management Plan is intended to facilitate.

2.1 Territory and Jurisdiction

The District is a County-wide public local agency, with regulatory jurisdiction in Humboldt Bay shoreward to mean higher high water (MHHW) elevation.

2.2 Organizational Structure

The District is governed by five elected commissioners, who are elected within the same jurisdictional boundaries as the Humboldt County Supervisors. The District staff of 13 people is comprised of management, maintenance, and clerical personnel. The District is divided internally into three main functional divisions, namely the Port of Humboldt Bay Division, the Woodley Island Marina Division, and the Resource Conservation Division. Within these three divisions a variety of projects and activities occur that are aimed at fulfilling the District's mission regarding Harbor, Recreation, and Conservation duties.

2.3 Examples of Projects and Activities

2.3.1 Harbor

The District oversees, coordinates or participates in a variety of harbor-related activities including, channel maintenance, channel improvement, dredging projects, port marketing and shipping facility improvements, oil spill response, navigation safety education, and oceanographic research. In April 2000 the Harbor Deepening Project was completed, which deepened the Harbor entrance to -48 feet Mean Lower Low Water (MLLW) and the North Bay and Samoa shipping channels to –38 feet (MLLW). This project was needed to improve navigation safety and to accommodate the needs of the current international shipping fleet. Other Harbor-related projects the District is involved in include participating in a commercial/industrial siting study for the harbor portion of Humboldt Bay, entitled the "Harbor Revitalization Plan;" cruise ship planning; employ the Bar Pilots; assist in the research of navigation and safety improvements for Humboldt Bay; coordinate the Humboldt Bay Oil Spill Cooperative; operate a marina and a boat yard; support commercial fishing and mariculture activities; and numerous other activities. Except for mariculture activities located in Arcata Bay, commercial/industrial harbor uses are limited to mid-Humboldt Bay (or Entrance Bay), an area extending from the Samoa Bridge south to the southern end of the Fields Landing Channel.

2.3.2 Recreation

The District owns and operates Woodley Island Marina, serving commercial and recreational vessels since 1981; and the Fields Landing Boat Yard, a self-service facility equipped with a 150-ton boat hoist. Woodley Island Marina is the largest marina in Humboldt County, with 237 berths.

Other recreational projects that the District is involved in include the Humboldt Bay water trail project; the Shelter Cove boat launching facility which serves southern Humboldt County and numerous visitors from elsewhere; providing assistance and support for other agencies' designs and improvements of boat launching facilities (Eureka Public Marina, Fields Landing, Hookton Slough); assistance in promoting and funding the Bay-wide interpretive signing program; sponsoring and coordinating the annual Humboldt Bay Maritime Expo; participating in other recreational events such as Paddlefest; Festival on the Bay; and supporting a variety of other recreational activities in and around Humboldt Bay.

2.3.3 Conservation

Humboldt Bay Harbor, Recreation and Conservation District, as the name implies, has ongoing involvements in a multitude of conservation activities around Humboldt Bay. These include managing three wildlife areas (Gerald O. Hansen Wildlife Area on Woodley Island, the King Salmon restoration area, and the Park Street wetland at Eureka Slough); educational outreach, including an "Adopt-the-Bay" program; assisting in planning and funding biological research projects around the Bay, including yearly native eelgrass (*Zostera marina*) surveys; and a monitoring and removal program for a non-indigenous eelgrass (*Zostera japonica*); and development regulatory authority.

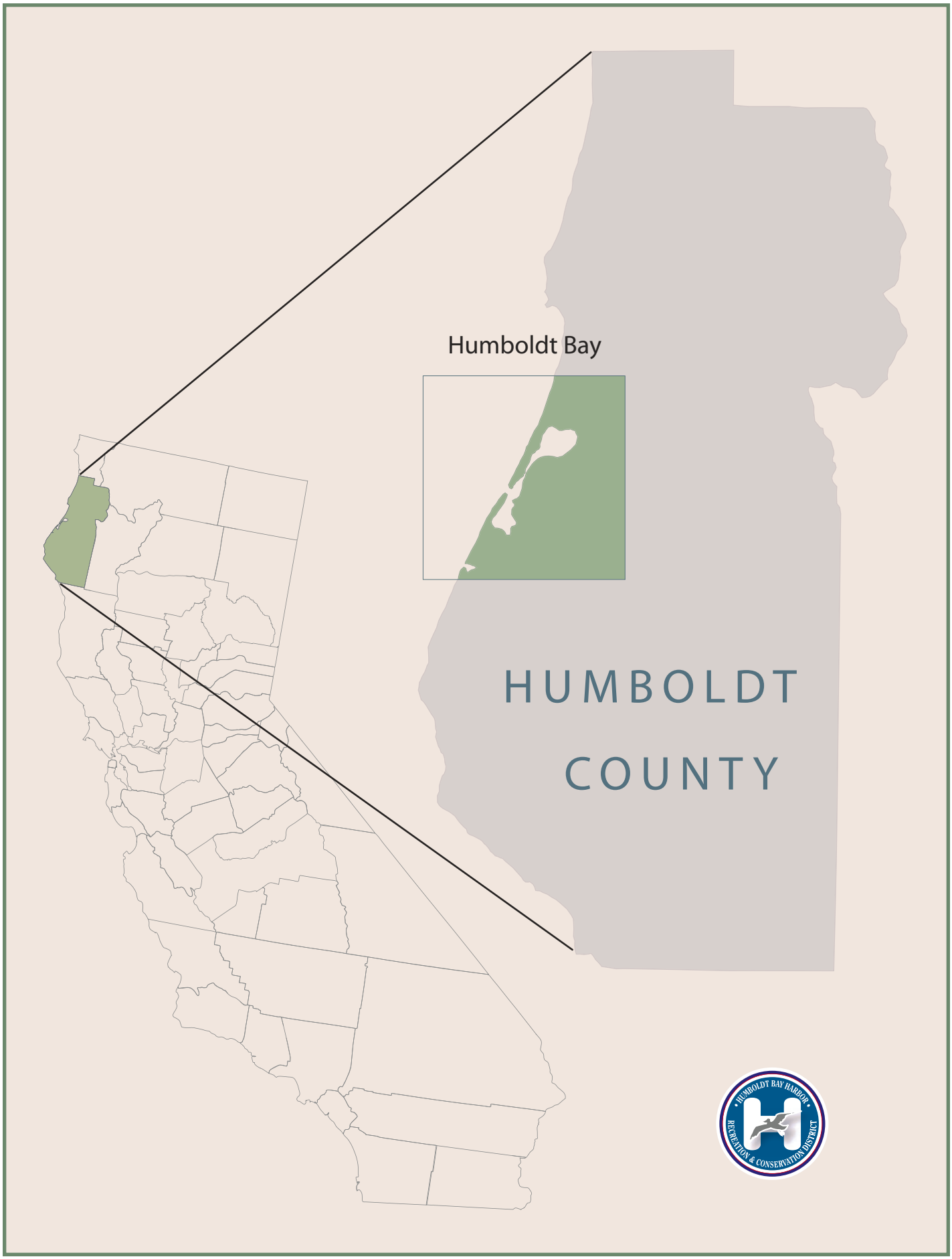


Figure ES-1: Humboldt Bay Management Plan Location

The District was the first local agency on the west coast of North America to develop and implement a ballast water exchange program, in an attempt to limit the introduction of invasive species from other ports (now overseen by the State of California). The District also oversees, coordinates or participates in the ongoing removal of non-indigenous species in wildlife areas as well as supporting and participating in other agencies' conservation programs. The District sponsors and coordinates the biennial Humboldt Bay Symposium held every even year.

The District has regulatory jurisdiction over all of the tide and submerged lands of Humboldt Bay. Therefore, the District's Board of Commissioners exercises development authority over every development project proposed in Humboldt Bay; in many cases the Board of Commissioners is also the lead agency for compliance with the requirements of the California Environmental Quality Act (CEQA).

For more information on the Humboldt Bay Harbor, Recreation and Conservation District's programs and activities, please consult the District's website at www.humboldtbay.org.

3.0 HUMBOLDT BAY MANAGEMENT PLAN

The concept of a Humboldt Bay Management Plan originated in 1997 when the need arose to update and develop a common database for use by Bay landowners and agency land managers to guide planning and research around Humboldt Bay. The District had previously created an ad-hoc agency/citizens committee labeled the Interagency Coordination Committee (ICC). The ICC's original purpose was to create a regular forum wherein agencies could report ongoing or upcoming Bay-related projects or issues. Early in the history of the ICC, it became evident that there was a lack of common base maps, resource databases, and coordinated Bay management among agencies. In order to improve Bay management in the future, the ICC recommended that an overall Bay management plan be developed by the District in coordination with other agency land managers and with input from Bay stakeholders representing the vast array of recreational, commercial, and conservation uses. This coordinated effort was titled the Humboldt Bay Management Plan.

With the assistance of the staff from Region 1 of the California Department of Fish and Game, the District was successful in obtaining a $17,000 grant from U.S. Fish and Wildlife Service to develop a Bay-wide parcel and ownership database and map; and a $202,304 grant from U.S. Environmental Protection Agency to assist in developing a database of 22 separate maps, in GIS format, representing all of the existing biological and physical characteristics of Humboldt Bay. Although some of the data sets were several years old, they still represented the best existing information for these resources. A conscious effort was made to focus on building this baseline database with the best existing information rather than embarking on new Bay-wide data-collecting efforts. The premise was that this baseline database would expose the needs for updating certain data sets, which then would be recommended as implementation measures in the Humboldt Bay Management Plan. The only data set deemed vital enough to deviate from this approach was Bay-wide eelgrass (*Zostera marina*) spatial distribution. As eelgrass is an important species throughout Humboldt Bay, updated eelgrass distribution information was necessary. Therefore, a new set of aerial photographs of the entire Bay was taken in September 2000 and subjected to a multi-spectral analysis. The entire baseline database was completed in 2002. The GIS information database is currently accessible on the District's website.

In order to formalize the Humboldt Bay Management Plan planning process, the District Board of Commissioners appointed the Humboldt Bay Management Plan Task Force (Task Force), made up of agency land managers and representatives of various Bay-user stakeholder groups, many of whom were regular participants in the ICC. These representatives are identified in Table ES-1. As the planning process began to take shape, the depth and importance of this effort became evident. Therefore, in order to assure proper stewardship over the planning process, the District appointed two of its own Board members,

Humboldt Bay Harbor, Recreation and Conservation District Board of Commissioners

District Administrative Core Team

Board Advisory Committee:

Commissioners Ronnie Pellegrini/ Dennis Hunter

Chief Executive Officer: David Hull

Conservation Specialist: Jeff Robinson

Environmental Planning Consultants:

Chad Roberts/Bruce Kemp

Task Force Representatives

City of Eureka: Gary Bird

City of Arcata: Juli Neander

County of Humboldt: Jimmy Smith

County of Humboldt: Kirk Girard

U. S. Environmental Protection Agency: Gail Louis

Bureau of Land Management: Bruce Cann

Humboldt Bay National Wildlife Refuge: Shannon Smith

California Department of Fish & Game:

Region 1: Mark Wheetley

Marine Region: Vicki Frey

Humboldt County Resource Conservation District: Otis Skaggs

Recreational User Group Representative: Pete Oringer

Environmental Group Representative: Jim Clark

Commercial/Industrial Group Representative: Andy Westfall

Mariculture Industry Group Representative: Greg Dale

Commercial Fishing Industry Group Representative: Ken Bay

Education Group Representative: Bill Schaser

California State Coastal Conservancy: Jim King

Table ES-1: Humboldt Bay Management Plan Project Organization

created and filled the Conservation Specialist position, and retained consultant Roberts, Kemp and Associates LLC to assist with Plan preparation and oversee the Plan's compliance with the California Environmental Quality Act (CEQA). It also became evident that additional funding would be required to complete the Plan. A $100,000 grant was awarded to the District in 2000 from the California State Coastal Conservancy to augment and expand the planning effort and to supplement existing funding from U.S. EPA and U.S. Fish and Wildlife Service.

3.1 Planning Process

One of the Task Force's first tasks was to develop project boundaries and a mission statement to guide the production of the Humboldt Bay Management Plan.

3.1.1 Planning Boundary

The planning area of the Humboldt Bay Management Plan consists of three components: (1) the Primary Area of Concern, (2) the Sphere of Interest, (Figure ES-2) and (3) the Humboldt Bay watershed (Figure ES-3).

The *Plan Boundary* is defined as all of the tidelands and submerged lands of Humboldt Bay shoreward to a tidal elevation of mean higher high water (MHHW), an area covering approximately 27 square miles. This planning boundary was chosen because it represents that portion of Humboldt Bay under the regulatory jurisdiction of the District.

The *Sphere of Interest* (SOI) is defined as those lands surrounding Humboldt Bay from MHHW inland to the established California Coastal Zone boundary. Although the Task Force realized that the Humboldt Bay Management Plan could not specify land uses within the sphere of interest, it was felt that the Plan should take into consideration the existing and planned land uses adjacent to the Bay in order to avoid land use conflicts and to provide the basis for considering adjacent land uses that actually or potentially affect Bay resources and activities. The intent of the SOI was to identify existing and future uses compatible with Humboldt Bay Management Plan recommendations within the Plan Boundary.

Activities and land uses that take place in the larger *Humboldt Bay watershed*, the larger geographical area that includes the District's "primary" and "secondary" areas of concern, may also directly or indirectly affect the subjects addressed in this Plan; such activities are, however, outside of both the District's area of direct or "primary" jurisdiction and the Public Trust lands that constitute the District's "secondary" area of concern. Accordingly, the District has identified the remainder of the Humboldt Bay watershed as a "tertiary" area of concern.

3.1.2 Mission Statement

Based on the aforementioned needs and purpose, the Mission Statement developed for the Humboldt Bay Management Plan is to:

"Provide a comprehensive framework for balancing and integrating conservation goals and economic opportunities in a cooperative manner for the management of Humboldt Bay's resources."

3.2 Plan Development

As the database was nearing completion, District staff and consultants were in place, and the planning boundaries and mission statement had been defined, the Task Force moved ahead with Plan development.

The District's Board of Commissioners desired to involve Bay stakeholders in the planning process early in the process so that the public would have the opportunity to provide input into the Plan, and the Task Force could develop management policies based on this input rather than merely receiving comment on the prepared document at the end of the process. Using this "bottom up" approach, the Task Force identified a number of Bay user/stakeholder groups and hosted a series of workshops to obtain stakeholder input for the Plan. Stakeholder workshops were held in 2001-2002 to address the following topics:

- Commercial/Industrial Waterfront Development
- Agriculture
- Environment
- Recreation
- Education

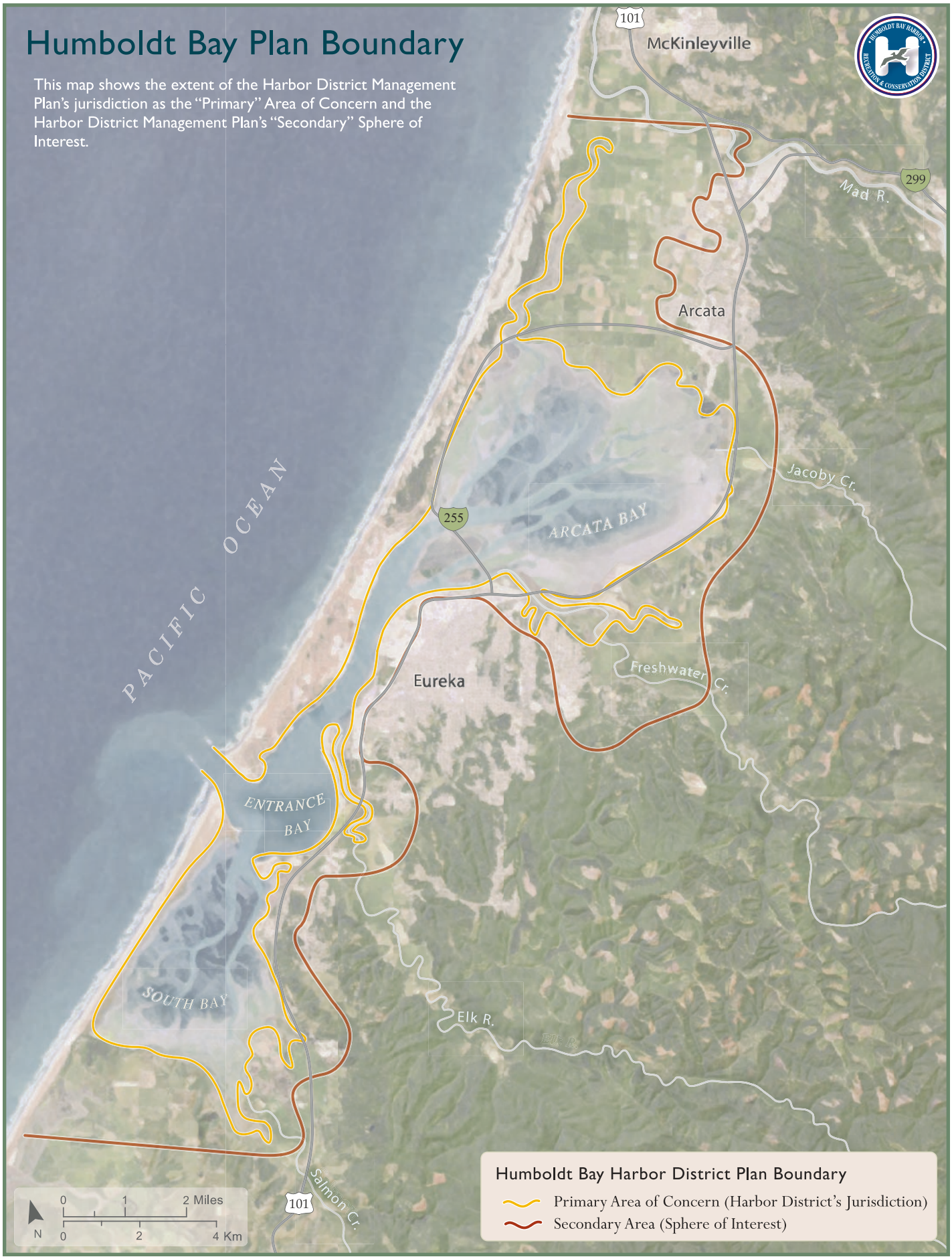


Figure ES-2: Humboldt Bay Primary & Secondary Boundaries

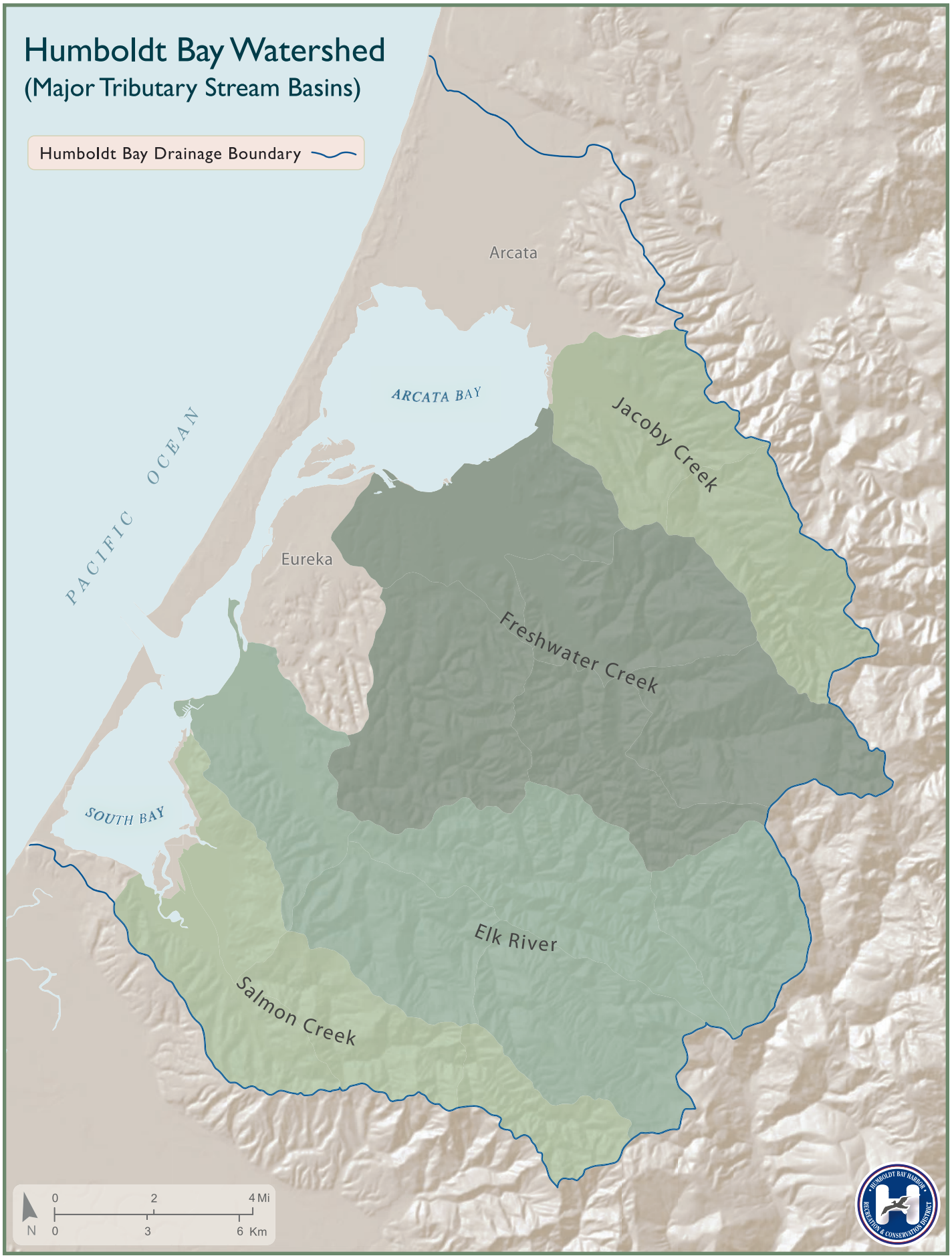


Figure ES-3: Humboldt Bay Watershed Area

- Commercial fishing
- Mariculture

Citizen participation at these workshops led to the identification of more than 350 substantive topics, which the Task Force distilled into the following issue categories for the Humboldt Bay Management Plan to address:

- Habitat and Living Resources
- Human Activities and Competing Uses
- Water Quality and Sediment Quality
- Public Participation and Education
- Research and Monitoring

Following the conclusion of the stakeholder meetings in May 2002, District staff began analyzing the comments and reviewing preliminary summaries of the information with each of the Task Force's stakeholder representatives. Based on stakeholder and Task Force input, the first internal draft of the Humboldt Bay Management Plan was produced in January 2004. In June 2004 Roberts, Kemp and Associates were retained by the District to assist in the assimilation and compilation of information and the preparation of the final Humboldt Bay Management Plan. The Plan and associated Programmatic Environmental Impact Report were adopted by the Board of Commissioners on August 24, 2006.

3.3 Document Structure

The Humboldt Bay Management Plan has been organized to contain the following elements:

- Volume I, including:
  - Executive Summary
  - Section I: Introduction
  - Section II: State of the Bay
  - Section III: Management Policies
- Volume II: Appendixes

3.3.1 Section I – Introduction

Section I introduces the background and history, as well as the need and origin, of the Humboldt Bay Management Plan. In addition, Section I describes the role and make-up of the Humboldt Bay Management Plan Task Force and the Plan development process.

Recreation

Conservation

Harbor

Section I also introduces the structure of the Humboldt Bay Management Plan by briefly describing the contents of each of the Volumes contained in the Plan. Generally, both the State of the Bay (Section II) and the Management Policies (Section III) are divided into the District's three main areas of focus, namely Harbor, Recreation, and Conservation. These three focus areas are further focused into geographic regions of Humboldt Bay consisting of Arcata (North) Bay, Entrance Bay (or Middle Bay), and South Bay.

3.3.2 Section II – State of the Bay

Section II consists of four chapters:

Chapter 1.0 – Introduction
Chapter 2.0 – The Harbor/Port Setting for Humboldt Bay
Chapter 3.0 – The Recreation Setting for Humboldt Bay
Chapter 4.0 – The Conservation Setting for Humboldt Bay

Chapter 1.0 of Section II provides a general summary of the policy framework in which the Humboldt Bay Management Plan is embedded. The District operates within its own legislatively established mandates, in a larger context that includes other, independent local agencies (which follow their own planning policy framework), state agencies carrying out established state programs, and federal agencies carrying out the provisions of federal programs. The information addressed in the Plan has been abstracted from existing adopted planning documents, as well as through consultations with staff from relevant agencies.

Chapters 2.0, 3.0, and 4.0 address specific setting conditions that are important for the policy framework laid out in Section III. These chapters reflect the District's three focus areas of Harbor, Recreation, and Conservation. Some of the information required in this Plan to address the ***Port/Harbor Setting*** (Chapter 2.0) has been abstracted from the recent Humboldt Bay Harbor Revitalization Plan and other recent planning documents.

The ***Recreation Setting*** summary in Chapter 3.0 identifies recreational uses and opportunities throughout the Humboldt Bay watershed, with a particular focus on how those uses and opportunities relate to Humboldt Bay. The content of this chapter is based on adopted plans and addresses the requirements of local, state, and federal laws with respect to recreational opportunities.

The discussion in the ***Conservation Setting*** in Chapter 4.0 is focused on environmental conditions and "resources" that are the subject of policy considerations in Section III. That is, the topics in this chapter are "key issues" for the policy document (Section III). As in the general discussion, this chapter is not encyclopedic in coverage, but it is intended to present the current understanding of basic and applied scientists, agency staff, and informed members of the public regarding ecological processes and the biological and physical conditions in Humboldt Bay that are necessary to carry out informed considerations of the policy framework in Section III.

3.3.3 Section III – Policy Document

Section III of the Humboldt Bay Management Plan consists of six chapters:

Chapter 1.0 – Introduction
Chapter 2.0 – Humboldt Bay Water Use Designations
Chapter 3.0 – Harbor Element Planning Policies
Chapter 4.0 – Recreation Element Planning Policies
Chapter 5.0 – Conservation Element Planning Policies
Chapter 6.0 – Implementation

Chapter 1.0 of Section III is a brief introduction to the overall Policy Document framework.

The discussion of ***Water Use Designations*** in Chapter 2.0 describes the District's intended focus on primary and secondary water use areas in Humboldt Bay. This chapter is similar to a land use designation section in the general plan for a local governmental jurisdiction. This chapter features text and a map delineating the use

designations considered for Humboldt Bay, including "primary" designations for ***Harbor*** and ***Bay Conservation*** and "combining" designations for ***Marine Recreation*** and ***Mariculture*** (Figure ES-4).

Chapters 3.0, 4.0, and 5.0 of the Humboldt Bay Management Plan identify a policy focus for the District's management actions in Humboldt Bay. These policies identify District responsibilities in the three primary areas (Harbor, Recreation, and Conservation) that the Task Force identified as the Plan's focus. As requested by the Task Force, each policy document chapter cross-references relevant policies in other chapters.

An ecosystem-based management approach requires a balancing of priorities and policies outlined in this Humboldt Bay Management Plan. It should be noted that the 104 policies specified in the Plan have not been prioritized. Instead, no one policy is considered to be more important than another policy, rather they are equals.

The Humboldt Bay Management Plan policy framework clearly establishes management directions for the following uses; harbor-related, recreation, and conservation therefore addressing the District's legislative mandates.

The tables below contains the heart of this Plan that is the policies; 38 harbor-related, 39 recreation, and 27 conservation policies. Each policy in the Plan is entered under a category which includes a full textual description as well as a discussion to further enumerate the policy. It is important to read the policy in its full entirety.

The Plan reflects a policy balance that recognizes the District's legislatively directed obligations to manage harbor-related, recreation-related, and conservation-related management goals for Humboldt Bay. Specifically there are three sets of management policies for Humboldt Bay:

1. policies for managing harbor functions
2. policies for managing recreation functions, and
3. policies for managing conservation functions.

Recreation

Conservation

Harbor

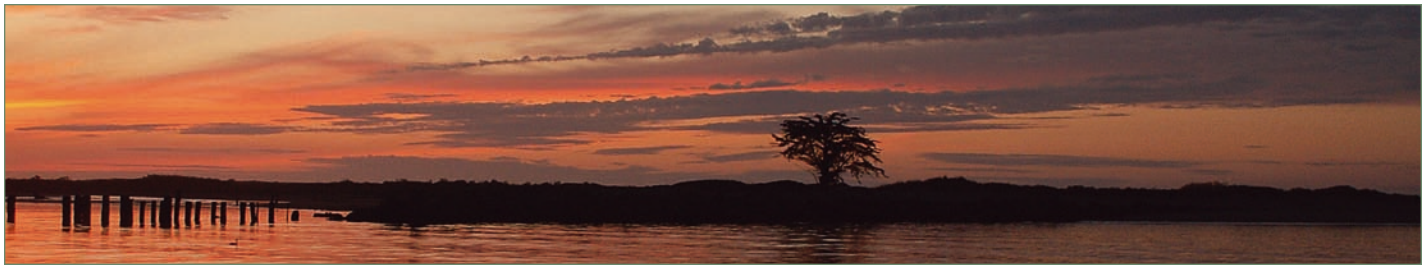
Figure ES-4: Humboldt Bay Water Use Designations

Chapter 3.0 presents the ***Harbor Element Planning Policies*** that carry out the District's obligations for managing Humboldt Bay as a port. In addition, this policy chapter addresses the District's approach to the ongoing maintenance of levees, dredged areas, and other elements of the human-modified bayscape, while also presenting policies that will help guide future restoration and enhancement planning work within the Bay.

Table ES-2: Harbor Element Policies

Harbor-Related Land Use and Development	Page
HLU-1: Harbor-related uses shall have priority under this Plan within the portions of Humboldt Bay designated for port-related or harbor-related uses	164
HLU-2: Assist local, regional, and state agencies in identifying and protecting harbor-related land uses in Humboldt Bay, and in developing increased institutional capability in the planning, regulatory, and development programs related to such uses	165
HLU-3: Assist in removing potential constraints for marine-dependent or coastal-dependent land uses along the Samoa Peninsula, Fields Landing Channel, Eureka shorelines, and other harbor-related areas (from Harbor Revitalization Plan)	165
HLU-4: Assist in removing potential constraints for marine-dependent or coastal-dependent land uses on harbor-related parcels in the South Bay (from Harbor Revitalization Plan)	165
HLU-5: Provide information for the public, and for decision-makers and staff of government institutions, to facilitate protecting and enhancing harbor-related opportunities for Humboldt Bay	166
HLU-6: Develop "specific plans" for District-owned parcels	166
HLU-7: Proposals for bay-related activities approved by the District shall incorporate appropriate noise control measures to avoid or reduce noise effects on events and activities carried out near the bay, to the extent feasible	166
Shoreline Management	**Page**
HSM-1: Develop an inventory of shipping terminal facilities necessary to carry out adopted harbor-related planning policies for Humboldt Bay	167
HSM-2: Develop an inventory of shoreline protection devices, identify potential needs for additional protection, and develop standards for new and existing Humboldt Bay shoreline protection	167
HSM-3: Develop appropriate, consistent shoreline protection guidelines for commercial, industrial, and residential development around Humboldt Bay	168
HSM-4: Require maintenance according to the District's adopted shoreline protection standards	169
HSM-5: Require evidence that shoreline protection proposals protect the environment and meet District requirements	169
HSM-6: Require the use of non-structural shoreline protection where feasible and appropriate	169
HSM-7: Identify needs for potential shoreline improvements necessary to accommodate bay water surface elevation changes, including potential effects of climate change	169
HSM-8: Develop coordinated plan for addressing seismic effects, land stability, and tsunami response plan for Humboldt Bay	170

Dredging and Waterway Maintenance	Page
HWM-1: Safe navigation in Humboldt Bay is a priority	171
HWM-2: Dredging may be authorized to meet Plan purposes	171
HWM-3: Re-deposition of dredged materials within Humboldt Bay may be authorized to meet Plan purposes	171
HWM-4: Placement of fill within Humboldt Bay may be authorized to meet Plan purposes	171
HWM-5: Potential dredged-material management options and alternative disposal methods shall be identified in a Long Term Management Strategy for Humboldt Bay	172
HWM-6: Sediment dynamics in Humboldt Bay shall be identified and a sediment management approach for Humboldt Bay shall be developed	172
HWM-7: Evaluate the extent of maintenance dredging required to meet the Management Plan's objectives	172
HWM-8: Evaluate channel maintenance alternatives for the community of King Salmon	173
Commercial Fishing and Aquaculture	**Page**
HFA-1: The District shall plan for, designate locations for, and seek to provide adequate berthing, marina space, moorage, and other facilities necessary to meet the operational and maintenance needs of commercial fishing vessels, recreational boats, and other small watercraft	174
HFA-2: Support the improvement of existing fish landing, buying, and processing facilities in the Humboldt Bay area	174
HFA-3: Protect appropriately designated shoreside areas for the development, maintenance, or expansion of commercial fish processing and aquaculture facilities or activities	175
HFA-4: Assist in developing agency approval strategies and funding for commercial fishing and aquacultural marketing and outreach activities in Humboldt Bay	175
HFA-5: Identify additional aquaculture opportunities in Humboldt Bay	175
HFA-6: Designate a Preferred Aquaculture Use Area in Arcata Bay, and require Best Management Practices to meet environmental constraints	175
HFA-7: Identify ecological and environmental factors affecting Humboldt Bay's fish populations, and the ecosystem elements that support them	175
HFA-8: Identify and implement the requirements for Bay management with respect to Essential Fish Habitat	176
HFA-9: Develop agreement with Wiyot Tribe to facilitate cultural resource management	177
HFA-10: Institute procedures to ensure compliance regarding cultural resources and related matters	177



Toxic Materials Management	Page
HTM-1: Enhance public outreach and educational programs addressing the impacts of toxic materials to Humboldt Bay and surrounding lands, and assist in educational efforts to prevent toxic spills	178
HTM-2: Monitor, comply with, and assist in updating as necessary the oil spill contingency plans for Humboldt Bay	178
HTM-3: Assure compliance with North Coast Air Quality Management District Rules for Particulates	178
HTM-4: Projects shall incorporate appropriate odor-control measures	178
Regulatory Streamlining	**Page**
HRS-1: Develop and implement a regulatory coordination process for projects around Humboldt Bay that are consistent with adopted plans	179

The ***Recreation Element Planning Policies*** in Chapter 4.0 address the interrelationships among the District's jurisdiction with those of other local agencies, including access "across" the shoreline. The requirements of various state and federal acts have been considered. To the extent possible, long-range plans for recreational improvements have also been incorporated.

Table ES-3: Recreation Element Policies

Recreational Administration	Page
RA-1: Humboldt Bay Management Plan Advisory Committee as a forum for recreation opportunities	184
RA-2: Partnerships with other recreation providers	185
RA-3: Recreation opportunities to be integrated with other District functions	185
RA-4: Capital improvement program and recreation budgeting	185
Recreational – Opportunities Planning	**Page**
ROP-1: Recreation planning to be an ongoing and coordinated function	186
ROP-2: Needs assessment and related use preference data	186
ROP-3: Identification of designated recreational use areas	186
ROP-4: Future recreation areas to be reserved as needed	186
Recreational Facilities and Access	**Page**
RFA-1: Safe and appropriate public recreational access to and use of the Bay	187
RFA-2: Project approvals shall incorporate public access and associated services and amenities where appropriate	187
RFA-3: Water-oriented recreation facilities; access for fishing and shellfish harvesting	187
RFA-4: Coastal-dependent industrial and commercial uses may take priority in designated Harbor areas	188
RFA-5: Environmentally and culturally sensitive areas	188

Recreational Facilities and Access—*continued*	Page
RFA-6: Prevention of significant adverse environmental effects	188
RFA-7: Protection of recreational areas	188
RFA-8: Minor amounts of fill authorized	188
RFA-9: Support public transportation	189
RFA-10: Signage and parking for public recreation areas, access points, and trails	189
RFA-11: Signage for boating safety	189
Recreation – Specific Activities	**Page**
RSA-1: Improvement and provision of boat launch sites	190
RSA-2: Assistance to, maintenance of, and consideration of marinas	190
RSA-3: Considerations for live-aboard boats	190
RSA-4: Anchorage, security, and disposition of recreational boats	190
RSA-5: Support opportunities for recreational fishing	190
RSA-6: Protect District-owned beaches for visitor-serving uses	191
RSA-7: Prohibition of off-highway vehicles on District-controlled properties	191
RSA-8: Use of concessionaires	191
RSA-9: Support for a water trails program for Humboldt Bay	191
Recreation – Interpretation and Outreach	**Page**
RIO-1: Interpretive program	191
RIO-2: Public interpretive center	192
RIO-3: Directing recreational users toward appropriate areas of the bay	192
RIO-4: Support for consistency in interpretive signs and displays.	192
Recreation – Visual Resources	**Page**
RVR-1: Views of Humboldt Bay shall be protected	192
RVR-2: Coastal-dependent uses shall facilitate public viewing, if feasible	193
RVR-3: Scenic views and vistas map	193
RVR-4: Trash and debris removal	193
RVR-5: Coordination with other jurisdictions on visual quality	193
RVR-6: Lighting shall meet federal and state guidelines	193
RVR-7: District to consider future policy on billboard controls	194

The growing attention to the ecological or conservation importance of Humboldt Bay, regionally, nationally, and internationally, requires a policy framework found in the ***Conservation Element Planning Policies*** in Chapter 5.0. This chapter addresses the District's conservation-related responsibilities and powers while attending to the statewide and national policy framework that is of interest to many Humboldt Bay stakeholders.

Table ES-4: Conservation Element Policies

Maintaining and Enhancing Aquatic Ecosystem Functions	Page
CAE-1: Base management decisions on maintaining the Humboldt Bay ecosystem, including the bay, the watershed, and the nearby ocean	200
CAE-2: Maintain, restore, and enhance aquatic ecosystem integrity	201
CAE-3: Protect and maintain environmentally sensitive habitat areas	201
CAE-4: Work cooperatively to develop and implement a restoration and enhancement plan for Humboldt Bay's aquatic ecosystems	202
CAE-5: Work cooperatively to develop and implement a water-quality maintenance plan for Humboldt Bay	202
Aquatic Species Management	**Page**
CAS-1: Maintain biological diversity and important habitats throughout Humboldt Bay	203
CAS-2: Maintain and enhance conditions required by commercially important fish, invertebrate, and plant species	204
CAS-3: Maintain and enhance habitat for sensitive species	204
CAS-4: Control or remove non-indigenous invasive species	205
CAS-5: Fill placement may be used for habitat enhancement purposes	205
CAS-6: Fill placement may be used for cultural resource protection purposes	205
Humboldt Bay Ecosystem Management Program Elements	**Page**
CEP-1: Impacts to streams, wetlands, estuaries, and coastal waters may be authorized for specific purposes or project types	206
CEP-2: Dredging may be approved under specified conditions	207
CEP-3: Revetments, breakwaters, and other shoreline structures may be approved under specified conditions	207
CEP-4: Functional capacity of aquatic ecosystems must be maintained	207
CEP-5: Water quality protection is required	208
CEP-6: Mitigation program requirements are identified	209
CEP-7: Mitigation efforts must follow an identified sequence, with avoidance preferred and compensation least-favored	209
CEP-8: Mitigation proposal elements are defined	210
CEP-9: Mitigation must be implemented before or at the same time as the impact being mitigated	210

Humboldt Bay Ecosystem Management Program Elements—*continued*	Page
CEP-10: Buffer requirements are defined for proposals affecting the Bay and other aquatic ecosystems	210
CEP-11: Determinations about boundaries, buffers, or other environmentally sensitive areas require specific information	211
CEP-12: Indian Island use shall be restricted to environmental and Native American purposes, and management decisions shall be made cooperatively	211
CEP-13: Greenhouse gas emissions to be considered	211
Public Involvement and Outreach	
CPE-1: District maintenance of communications with media	212
CPE-2: Increased use of District website for communicating about Bay management	212
CPE-3: Humboldt Bay Management Plan Advisory Committee as forum for environmental resources and other management considerations	212

Chapter 6.0 identifies the general ***Implementation Program*** anticipated for enactment by the District's Board of Commissioners in order to enable and carry out the Plan's recommendations. The primary responsibility for the Plan's implementation lies with the Board of Commissioners and with District staff, working in collaboration with applicants, other agencies, and the public. The implementation program also includes the development of an Advisory Committee of interested citizens and agency representatives, which will coordinate with District staff to review and establish priorities for implementation tasks. The role of the Advisory Committee is expected to be focused on providing advice to the District's staff and the District's Board of Commissioners regarding implementation priorities.

The implementation approach described in Chapter 6.0 incorporates three general courses of action, depending on specific circumstances:

- When the implementation involves a proposed project or other definite action, the District's staff will review the proposed application with respect to the Plan's policies, recommending action to the Board of Commissioners.
- When the implementation of the Plan's policies involves the development by the District of procedures (e.g., a "shoreline protection manual" or similar standardized approach to Bay management), District staff and the Advisory Committee will consider the relative priorities for District implementation, and the Advisory Committee will recommend priorities for staff development of the relevant materials. Staff will develop the procedural guidance, consulting with other agencies and with appropriate experts and interested parties. When the appropriate procedures have been developed, District staff will present the material to the District's Board of Commissioners for consideration and adoption, including public review elements. When adopted by the Board, these procedures will become standards for implementing the Plan.
- When the implementation of Plan policies includes collaborative planning or action by the District and other agencies (e.g., the development of a Bay-wide wetland enhancement or restoration plan, or the development and enactment of a memorandum of agreement that the District will act jointly with another agency to carry out a policy that covers a shared interest), District staff and the Advisory Committee will consider the relative priorities for District implementation, and the Advisory Committee will recommend priorities for staff development of appropriate memoranda. These recommendations will be presented to the District's Board; upon direction from the Board, staff will convene

the work-group necessary to carry out the policy recommendation, meeting with interested parties and/or with the staff or decision-makers of the relevant agencies in order to develop the appropriate plan or memoranda of understanding/ agreement (MOU/MOA). The resulting plan or MOU/MOA will be considered by the District's Board, including public review elements. When the plan or MOU/MOA is adopted or executed by all appropriate parties, the plan or memorandum will become a standard for District implementation of the Management Plan.

3.3.4 Volume II – Appendices

Volume II of the Management Plan incorporates three broad components. One component contains text references of laws, rules, and regulations relevant to Bay management, from the District as well as from other relevant agencies. This portion of the Appendices contains a synopsis of selected agency and stakeholder contact information.

The second component of the Appendices includes a variety of background information relevant for the Plan, such as a glossary of selected terms, and guides to selected lists of species identified in the Bay. These guides are intended for general reference and educational purposes and are not intended as a characterization of the ecological setting of Humboldt Bay.

Finally, Volume II contains a summary of advisory group comments developed during the preparation of the Humboldt Bay Management Plan, as well as complete copies of all public comments received by the District regarding the Public Draft Management Plan in March and April of 2005.

Section I

Introduction to the Plan

Humboldt Bay Management Plan

May 2007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Introduction to the Humboldt Bay Management Plan

SECTION I

1.0 General Setting

Humboldt Bay is located approximately 265 miles north of San Francisco, California, and approximately 250 miles south of Coos Bay, Oregon. Humboldt Bay is located in the heartland of California's majestic Redwood forest region. The area contained within the Humboldt Bay watershed is rich in rolling farmlands, scenic beaches and dunes, creeks, lush woodlands, and diverse wetlands.

The approximately 225-square-mile watershed that drains into Humboldt Bay consists of land areas that contribute groundwater and stormwater runoff into the major tributaries and into Humboldt Bay directly. Humboldt Bay has numerous ecosystems that are home to many plant and animal species, including several classified as endangered or threatened under federal or state law.

Bountiful aquatic organisms support commercial and sport finfishing and shellfishing, and the Bay supports many other water-dependent and water-related activities. Tourism and recreation are central to Humboldt County's local economy, including businesses such as restaurants and marinas that cater to recreational fishermen, birders, boaters, bathers, hunters, and nature enthusiasts.

Both residents and visitors enjoy the numerous ecological, cultural, and economic assets of Humboldt Bay. Arcata, located on Humboldt Bay's northern section, is home to approximately 16,651 people;[1] Eureka, in the central portion of the Bay, has a population of about 25,866; and Loleta/Table Bluff, in the southern section of the Bay, supports about 750 people. This population, and associated development and land uses, puts pressure on the area's natural resources and affects water quality. In recent years, many stakeholder groups have expressed concern about the impacts of population growth, proposed new development, and natural resource exploitation on the overall health of Humboldt Bay's ecosystem.

Recreation

Conservation

Harbor *(Photo by Sy Beattie)*

[1] Population numbers are estimates, based on 2000 Census.

Historically impacts from population growth and unchecked development have not been as severe around Humboldt Bay as those seen in other coastal regions of California. However, there is a growing awareness of the need for efforts to address existing problems and to enact proactive efforts to prevent degradation of Humboldt Bay's ecosystem.

2.0 Purpose of the Humboldt Bay Management Plan

The purpose of the Humboldt Bay Management Plan ("Plan" or "HBMP") is to serve as a management guide, planning tool, and policy strategy, as well as to be a reference document for the Humboldt Bay Harbor, Recreation and Conservation District (hereinafter referred to as the "District" or "HBHRCD") and other resource management agencies and organizations interested in Humboldt Bay.

The management plan is intended to guide new projects around the Bay, such as project planning, master plans, mitigation strategy development, compliance with California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), Coastal Zone Management Act (CZMA), and Clean Water Act (CWA), and to assist in daily resource management work.

To accomplish this, an inventory of bay resources was first established to identify status, establish indicators of environmental quality, identify trends over time, and determine probable trends of concern. This plan is formulated in such a way as to set objectives for resource management and identify recommend approaches that will reduce the potential for future problems and user conflicts.

State and federal agencies, local governments, business and industry, academia, environmental organizations, commercial and recreational users, and the general public have joined together to identify Humboldt Bay's resource issues and to provide guidance on scientific studies to characterize the issues. The Management Plan identifies resource management needs, and sets out a mechanism to identify priorities and to develop partnerships in order to achieve this goal over the next ten years.

The Humboldt Bay Management Plan is intended to be a long-term strategy for resource management around and within Humboldt Bay. The intention of the HBMP is to provide direction, facilitate partnerships, and promote the stewardship of Humboldt Bay's natural and environmental resources, in the HBHRCD's continued management strategy of Humboldt Bay. The HBMP ventures beyond the District's jurisdictional boundaries in order to evaluate the interconnections among human uses and the natural and environmental resources of Humboldt Bay.

As the various management strategies for the Humboldt Bay Management Plan are implemented, their results monitored, and additional scientific information gathered, this HBMP will evolve, like Humboldt Bay. This plan is meant to be a living and changing document.

There is more information pertaining to Humboldt Bay than most individuals can grasp. If the phenomena and interrelationships among elements at any given time were not enough to boggle our intellects, there are constantly changing complexities occurring within the ecosystems that we are trying to understand.

The Humboldt Bay Management Plan seeks not only to provide information to resource managers on the current state of Humboldt Bay's biological and physical resources but also to provide a guideline for future resource management strategies that will ensure compatibility with Humboldt County's need for economic stability.

3.0 Geographical Coverage of This Plan

The District has identified a geographical region of coverage for the Humboldt Bay Management Plan. In the broadest sense, the Plan coverage area reflects the District's general interests in the Public Trust lands near Humboldt. The District's interests, however, are not uniform throughout this broadly defined region.

3.1 The Plan Boundary—Primary Area of Concern

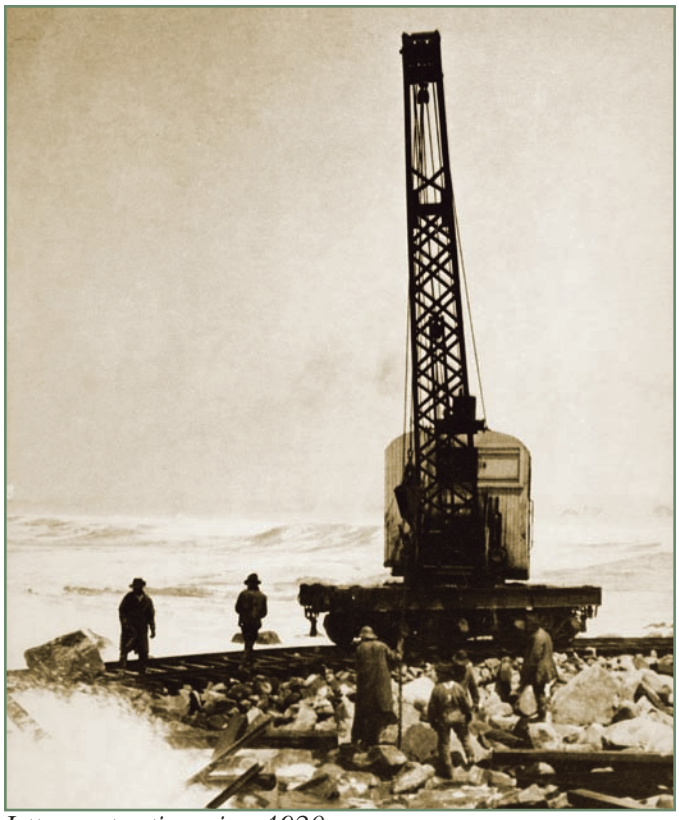
The legislation that created the District[2] established the District's authority to act within a specified area within the Humboldt Bay watershed. Generally, this area of primary District jurisdiction includes the region of Humboldt Bay that is wetted by the tides. This region includes: (1) all of Humboldt Bay bayward of existing levees, (2) most of Mad River Slough, (3) the region of Eureka Slough (including Freshwater Slough and Ryan Slough) approximately to the limit of tidal action (which is generally identified as the location of Myrtle Avenue), (4) Elk River to the limit of tidal action, and (5) the tidally influenced parts of Hookton Slough and Salmon Creek in South Bay. As discussed further below, the District's authority also includes a number of District-owned parcels (including areas of uplands) at Woodley Island, the Park Street mitigation site, the Fields Landing Boat Repair Facility (Kramer Dock) site, the Redwood Dock parcel on the Samoa Peninsula, a small parcel within the mouth of the Elk River, and a restoration area at Buhne Point in King Salmon.

This area (shown in Figure 1-1) should be considered the District's "primary" area of concern under this Plan. The District has decision-making responsibility for this region, and the policy framework in this document specifically applies to, and constitutes the basis for, the decisions that the District will make in this region.

3.2 The Sphere of Interest—Secondary Area

As discussed further in Section II, focusing only on a portion of the Humboldt Bay ecosystem on the basis of a "political" boundary, based on the locations of levees that separate tidelands and diked former tidelands, does not sufficiently encompass the ecological dynamics that affect District concerns within the Bay ecosystem. In consequence, the District has also identified an area of "secondary" concern for the District's planning considerations, the "Sphere of Interest" (also shown in Figure 1-1).

[2] Appendix 2 of the California Harbors and Navigation Code (Chapter 1283 of the Statutes of 1970), as amended, which created the Humboldt Bay Harbor, Recreation and Conservation District. See Appendix B in Volume II of this Plan.



Jetty construction, circa 1920

The "secondary" area encompasses the remainder of the Public Trust lands.[3] This area generally includes the region that was subject to tidal action when California became a state; this is, conceptually, the area behind levees and tidegates that would be subject to District jurisdiction if the levees were not present. This Plan includes policy elements that express the District's interests within the "secondary" area, reflecting the District's relationships with other local governments, and to some extent with state and federal agencies, regarding management in the "secondary" area of concern.

3.3 The Watershed—Tertiary Area

Activities and land uses that take place in the larger Humboldt Bay watershed, the larger geographical area that includes the District's "primary" and "secondary" areas of concern, may also directly or indirectly affect the subjects addressed in this Plan; such activities are, however, outside of both the District's area of direct or "primary" jurisdiction and the Public Trust lands that constitute the District's "secondary" area of concern.

[3] The boundary of the lands subject to the Public Trust near Humboldt Bay is nearly coincident with the Coastal Zone boundary near Humboldt Bay; this would be an alternative perspective useful in understanding the District's "secondary" area of concern.

Abundant animals

Tugs

A spectacular sunset

Accordingly, the District has identified the remainder of the Humboldt Bay watershed as a "tertiary" area of concern. The watershed area is shown in Figure 1-2.

4.0 Humboldt Bay as Three Bays

Following its establishment in 1970, the District commissioned a master plan for Humboldt Bay (Koebig and Koebig 1975) that identified conceptually important geographic distinctions within Humboldt Bay. The central part of Humboldt Bay that was associated with the Bay's entrance, channels, and wharfage was identified as the part of the Bay of greatest significance for commercial and coastal-dependent industrial uses (the "Development – Water"), while the northern and southern parts of the Bay and large areas in the central part of the Bay were identified as having greater importance as habitat or natural areas (the "Conservation – Water").

This plan also addresses Humboldt Bay management in terms of these three sub-areas, shown in Figure 1-3. The general kinds of activities that the District anticipates will occur in each of these primary sectors of Humboldt Bay represent a broad policy framework with respect to uses in the Bay. That is, the segregation of Humboldt Bay into three geographically distinct areas represents the first "layer" of the District's management approach. However, the separation is "for management purposes only," and the District's staff and decision-makers are aware that the elements that constitute the Humboldt Bay ecosystem cross these artificial jurisdictional boundaries.

4.1 Arcata Bay

The northern part of Humboldt Bay is often identified as Arcata Bay. The generally recognized southern boundary of Arcata Bay is the Highway 255 bridge between Eureka and the Samoa Peninsula, owing to the extension of maintained dredged Eureka and Samoa channels to the location of the bridge.[4]

[4] In general, the planning boundaries adopted in Section III should not be interpreted as strict geographical limits for the biophysical elements described in Section II. The planning boundaries reflect districts in which various management policies apply. These districts approximately correspond to biophysically relevant regions in Humboldt Bay, but this Plan does not intend to identify congruence between the planning designations and the biophysically defined regions.

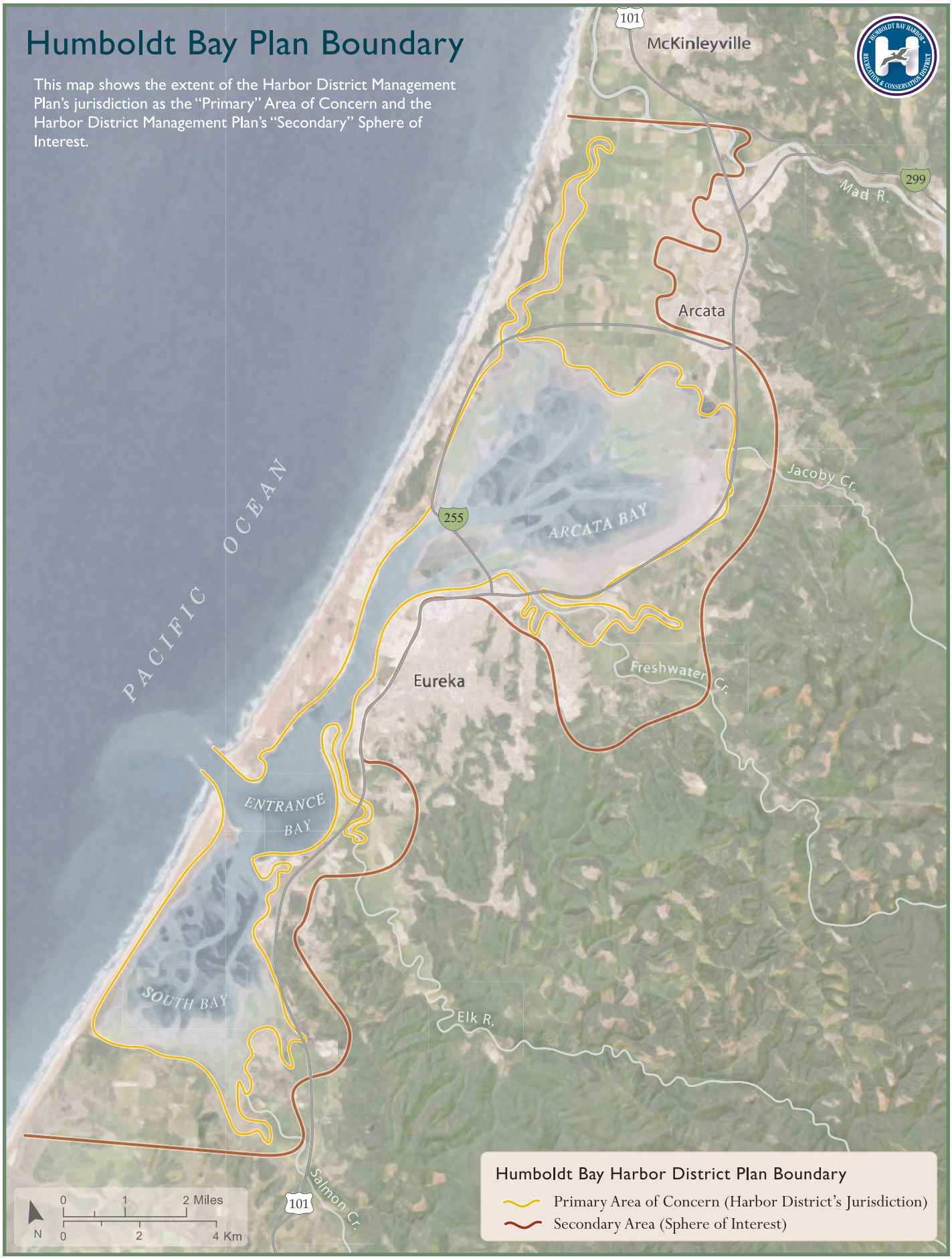


Figure 1-1: Humboldt Bay Primary & Secondary Boundaries

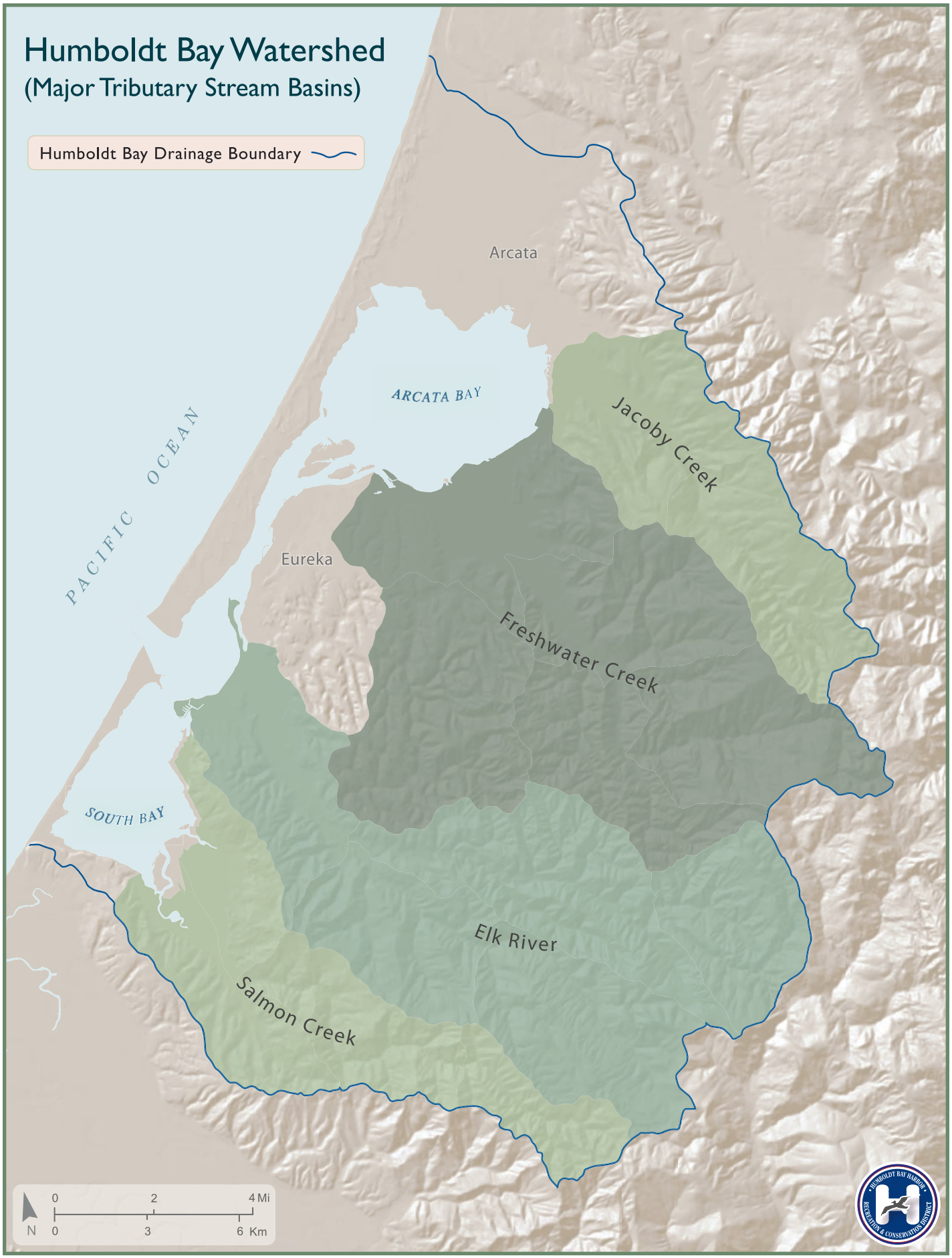


Figure 1-2: Humboldt Bay Watershed Area

The District's Management Plan Task Force ordained that the Management Plan should identify the generalized uses that would be preferred in Arcata Bay to be: (1) a continued or heightened protection of Arcata Bay's environmental resources, as well as (2) the continued use of Arcata Bay for aquaculture or mariculture, and (3) the continuance and enhancement of recreational opportunities.

Shipbuilding circa 1890–Shaw & Lambert Boatyard

4.2 Entrance Bay

The central part of Humboldt Bay is often identified as "Entrance Bay." Generally this region extends from approximately the Highway 255 bridge through the narrow central part of the Bay. The southern margin of Entrance Bay may be thought of most effectively as including the deeper waters inside the Bay opposite the mouth, extending to the vicinity of the Pacific Gas and Electric Company (PG&E) plant. Entrance Bay includes the dredged channel to King Salmon and to the southern extent of the Fields Landing Channel (as in Figure 1-3).

The Management Plan Task Force determined that management in Entrance Bay should be focused on: (1) harbor-related uses, (2) maintenance or enhancement of Entrance Bay's environmental resources, and (3) maintenance and enhancement of recreational opportunities.

4.3 South Bay

The remaining part of the Bay, South Bay, includes extensive tidal flats and eelgrass meadows. South Bay generally is considered to include the shallows and tidal channels south of the deeper Entrance Bay.

The Management Plan Task Force identified the predominant preferred uses in South Bay as: (1) protection and enhancement of South Bay's environmental resources; and (2) port-related uses, in terms of the dredged channel to King Salmon and Fields Landing and the associated harbor-related facilities. Since the latter are identified in this plan as included in Entrance Bay, the predominant preferred uses in South Bay are: (1) the protection and enhancement of the South Bay's environmental resources, and (2) maintenance and enhancement of recreational opportunities.

Humboldt Bay contains approximately half of California's eelgrass resource

Figure 1-3: Humboldt Bay Three Bays Map

5.0 Roles and Responsibilities of the District

5.1 Regulatory Responsibilities and Authorities

The District was legislatively created as a local agency under California law. This mode of creation invested in the District the legal powers and responsibilities of a local government, in addition to establishing the enumerated powers identified in the establishing legislation. These powers create in the District the regulatory authority needed to implement the provisions of a Humboldt Bay Management Plan, akin to the powers vested in the cities and the County.

The general authority of the District includes the following:

- "acquisition, construction, maintenance, operation, development and regulation of harbor works and improvements, including rail, water, and air terminal facilities;
- "development, operation, maintenance, control, regulation and management of Humboldt Bay upon the tidelands and lands lying under the inland navigable waters of Humboldt Bay;
- "promotion of commerce, navigation, fisheries, and recreation thereon;
- "development and protection of the natural resources of the area."

The District is governed by a Board of Commissioners, elected at large by voters in Humboldt County. The District is subject to the Brown Act and other laws regulating the conduct of government business. The District has taxing authority and the power of eminent domain.

In implementing these powers, the District has adopted a number of ordinances, including several that implement the District's authority for Bay management:

- Ordinance 4: this ordinance authorizes the District to issue emergency and administrative permits for uses in Humboldt Bay.
- Ordinance 7: Ordinance 7 establishes the current planning and policy framework for managing the District's responsibilities.[5]
- Ordinance 11: this ordinance prohibits the use of vehicles, including off-highway vehicles, within District-owned land at Buhne Point/King Salmon.
- Ordinance 14: this ordinance authorizes the District to issue permits, leases, and other authorizations for uses of Humboldt Bay.
- Ordinance 17: this ordinance regulates anchoring and related uses in Humboldt Bay.

The District, as with other local agencies, acts in accordance with applicable state and federal laws, and this Plan incorporates policy directions that will help in guiding Humboldt Bay's management consistently with the state and federal laws and the associated regulations.

In implementing this Plan, the District will exercise the authorities granted to it under state law, including those briefly synopsized here and others not fully enumerated.

5.2 Trust and Stewardship Responsibilities

The District is explicitly authorized, in its establishing legislation, to plan for, regulate, and/or protect many environmental resources that occur in Humboldt Bay, including "fisheries" and "natural resources;" to control the impacts from "pollution" and "dredging and filling;" and to protect "wildlife habitats" and "open space areas." The establishing legislation clearly establishes the District's authority, and its obligation, to manage and protect environmental resources.

The District is also explicitly authorized, in its establishing legislation, to plan for and implement "harbor works and improvements" of many kinds, relating to "commerce," "navigation," and "fisheries," among other uses of the Bay.

All of these considerations are allied with a common-law doctrine covering the state's "sovereign" lands

[5] Ordinance 7 is, effectively, the District's current Humboldt Bay Management Plan.

known as the "Public Trust Doctrine," which reflects the obligations of state government to maintain and protect uses of tidelands for the citizens of the state. The legislation that established the District formally transferred ownership of tidelands in Humboldt Bay to the District; this act also transferred to the District a portion of the state's obligations for maintaining the Public Trust, although the Public Trust may not be alienated from state government and the State Lands Commission retains a residual role in overseeing the District's management with respect to Trust purposes.

The State Lands Commission (SLC) has enunciated a policy regarding the Public Trust[6] that includes the following:

"Uses of trust lands, whether granted to a local agency or administered by the State directly, are generally limited to those that are water dependent or related, and include commerce, fisheries, and navigation, environmental preservation and recreation. Public trust uses include, among others, ports, marinas, docks and wharves, buoys, hunting, commercial and sport fishing, bathing, swimming, and boating. Public trust lands may also be kept in their natural state for habitat, wildlife refuges, scientific study, or open space. Ancillary or incidental uses, that is, uses that directly promote trust uses, are directly supportive and necessary for trust uses, or that accommodate the public's enjoyment of trust lands, are also permitted. Examples include facilities to serve visitors, such as hotels and restaurants, shops, parking lots, and restrooms. Other examples are commercial facilities that must be located on or directly adjacent to the water, such as warehouses, container cargo storage, and facilities for the development and production of oil and gas. Uses that are generally not permitted on public trust lands are those that are not trust use related, do not serve a public purpose, and can be located on non-waterfront property, such as residential and non-maritime related commercial and office uses. While trust lands cannot generally be alienated from public ownership, uses of trust lands can be carried out by public or private entities by lease from this Commission or a local agency grantee. In some cases, such as some industrial leases, the public may be excluded from public trust lands in order to accomplish a proper trust use."

The District has been authorized by the State of California to manage Humboldt Bay in all ways and for all uses that are consistent with the Public Trust. The District is authorized to weigh, and balance, potentially competing or conflicting uses. These authorities will be exercised by the District according to the policies included in this Plan.

5.3 District Multi-Use Areas

In addition to its role in managing the Public Trust lands and waters of Humboldt Bay, the District also owns and manages several properties and facilities that are used for a variety of purposes, consistent with the District's multiple functions in managing Bay resources and activities. The following is a summary of the main properties and facilities owned and operated by the District in and around Humboldt Bay.

5.3.1 Woodley Island

Woodley Island is divided into three functional components that are managed by the District. These three components are the Woodley Island Marina, the on-shore marina support facilities, and the Gerald O. Hansen Wildlife Area.

The Woodley Island Marina is a major Bay-user destination site, a visual focus point, and an important node of recreational use and Bay access on Humboldt Bay. The Marina, constructed in 1981, provides 237 slips for recreational and commercial vessels and related on-shore support facilities. On-shore facilities include U.S. Coast Guard, U.S. Army Corps of Engineers, and U.S. Weather Service offices; the Marina office and District headquarters; restroom facilities; laundromat; ship's chandlery; work yard; work dock with one and two-ton hoists; marine storage yard; a canoe/kayak launch area; parking; restaurant/bar and scenic views of wildlife areas, boats, open water, and waterfront buildings. Services provided at Woodley Island Marina include vessel sewage pumpout facility, oily bilge water pumpout stations throughout the marina; waste oil disposal facilities; water; electricity; and forklift

[6] See URL: http://www.slc.ca.gov/Policy_Statements/Public_Trust/Public_Trust_Policy.pdf (viewed February 2007).

rental. Concessionaires provide other recreation-related functions, including kayak and canoe rentals and charter sportfishing.

The marina consists of nine docks (identified by letters A-I) a work dock, and a floating breakwater. Slips increase in size from east to west and range from 30' to 70'. End-ties are located at the Eureka channel side of the docks and range from 70' to 150'. The marina has two depth zones; Docks A-E are maintained at a depth of –14' (MLLW) and Docks F-I are maintained at a depth of –10' (MLLW). As Woodley Island Marina is located on the Eureka Channel, which is for all intents and purposes an extension of Eureka Slough draining the Freshwater Creek/Ryan Slough watersheds, periodic maintenance dredging is required in order to maintain the original depths and functions at the marina. Typically, approximately 120,000 cubic yards of accumulated sediment is maintenance-dredged every 7-10 years. A cutter-head suction dredge has been determined to be the most effective, efficient, and cost-effective method of maintenance-dredging the marina. Dredge material is then pumped from the dredge through a flexible, temporary pipeline for discharge onto Samoa beach during the late fall, winter, and early spring months only.

The southern half of Woodley Island, including and south of Startare Drive, is managed for visitor-serving purposes. This area includes landscaped turf areas and planters filled with a variety of plant materials designed for durability, diversity, and color. This area also includes all of the services, offices, parking, access, and interpretive displays. Interpretive displays located on Woodley Island include the original 1892 Table Bluff lighthouse, a whistle buoy, Fishermen's memorial, Fishermen's statue, Indian Island Massacre historic site plaque, and a variety of displays depicting the various techniques used in commercial fishing and mariculture.

The northwestern half and eastern end of Woodley Island comprise the Gerald O. Hansen Wildlife Area. This wildlife area, named in the memory of the District's former Treasurer of 27 years, was set aside during the construction of Woodley Island Marina. The District manages this area for native plant species, through revegetation and actively removing and controlling invasive non-indigenous species. The District restricts use to this area for seasonal vegetation maintenance and scientific study. The wildlife area is used extensively by waterfowl, egrets, herons, and small mammals. The wildlife area is also home to a small resident deer herd. Use rules and regulations for Woodley Island are codified in District Ordinance 9.

5.3.2 Park Street Mitigation Site

The District acquired, in 1979, an approximately 20-acre property at the foot of Park Street in Eureka as a mitigation site to compensate for loss of wetlands and other habitats associated with development of Woodley Island Marina and related dredging, east of Samoa Bridge. The property is located adjacent to, and includes a portion of, Freshwater Slough, an estuarine element of Humboldt Bay. The approximately 14-acre mitigation site is located in the area of an abandoned log pond, formerly a tidal salt marsh, and also includes a freshwater marsh area created by the construction of an interior dike. The salt marsh portion of the site was re-created by breaching the dike adjacent to Freshwater Slough in 1981. Primary use of the property is for wildlife habitat. Public use of the site is low; schools occasionally use the site for science education purposes. Use restrictions and regulations are codified in District Ordinance 12.

5.3.3 Fields Landing Boat Repair Facility/ Kramer Dock, Fields Landing

The Fields Landing Boat Building and Repair Facility was constructed by the District in the early 1980s. This facility is located at the southern end of the Fields Landing Channel and was a former mill site and lumber export facility. The approximately 18-acre site including the five-acre boat yard is designated by the local coastal plan for coastal-dependent industrial uses. Although the primary use of the site is for the only boat yard on Humboldt Bay and marine terminal use, the site's proximity to the Bay has historically provided a low level of public access to South Bay for hunting, fishing, and kayaking. Additionally, the

District provides a small building on this property for use by the local Sea Scout program.

The boat yard operation was contracted to a private operator until 1999. Since 1999, the District has staffed, operated, and maintained the boat yard facility. The boat yard's current facilities include approximately five acres of paved and fenced area. Within the paved area includes several power and water stations, yard lighting, an 8,000 square-foot building to house the 150-ton marine travelift or straddle-carrier, and office and restroom facilities. Under the District's current operation, District staff will haul and launch vessels and provide facility maintenance and security during business hours. Contracted security is utilized during night and weekend hours. Boat repairs are carried out by owners/crews or by contracted labor. The rules and regulations and fee structure is determined by the District's Board of Commissioners and through District Ordinance 16.

5.3.4 King Salmon Beach and Dunes Recreation Area

This District-owned site is located northwest of Buhne Drive in the unincorporated community of King Salmon on the South Bay. Due to excessive shoreline erosion in the late 1970s and early 1980s, the District partnered with the U.S. Army Corps of Engineers to install two rock groins and rebuild the beach area. After construction, the majority of the new beach and dunes area was fenced and vegetated with native dune plants. In 1997 the fences were removed and the beach/dune area was opened to the public. The District presently works to attempt to control the spread of non-indigenous dune plants; it also maintains two fire rings and a portable bus stop for local school-children. The original plans also included some of the infrastructure to add a ballpark on the southern end of the property in the future.

Motor vehicles are prohibited on this property and other use restrictions are enforced through District Ordinance 11. The general area of King Salmon Beach is an open sandy beach used for walking, birdwatching, launching small boats, and general outdoor enjoyment. Roadway improvements by the County allow parking along Buhne Drive.

6.0 Relationships with Other Local Planning Actions and Planning Documents for the Humboldt Bay Region

The framework for this Plan incorporates areas of primary, secondary, and tertiary District interest, as noted above. Local planning actions carried out pursuant to this Plan, and the District's expected interactions with other local planning jurisdictions, will differ according to the area under consideration.

6.1 Areas of Primary Interest

The District is the principal regulatory agency with local jurisdiction within the Bay for the majority of the Bay's tidelands [the lands below mean higher high water (MHHW), including lands in the undiked major streams/sloughs] according to the terms of the legislation that created the District. Within these tidelands the District will serve as the "lead agency" for application reviews, environmental assessments, and other reviews and approvals authorized for "local agencies" under state law.

Some tidelands were, however, granted to the City of Eureka and other tidelands to the City of Arcata; accordingly, these cities exercise some original jurisdiction over the primary area covered by this Plan.[7] The City of Eureka and the City of Arcata have General Plans (including Local Coastal Plan coverages that implement the Coastal Act's requirements) that have been updated within the past decade. These General Plan documents constitute the primary policy guidance for the cities' regulation of the tidelands within Humboldt Bay that fall under the cities' jurisdiction.

The Humboldt Bay National Wildlife Refuge (U. S. Fish and Wildlife Service) also owns some tidelands,

[7] The legislation that established the District also authorized to District to negotiate for, and to accept, conveyance of these tidelands from the cities to the District. This Plan does not presume that such conveyances will take place; conveyances of the city tidelands to the District would not likely change many of the policies in the Plan, but the implementation elements of some policies would likely differ.

including saltmarsh and mudflat, in Arcata Bay and in South Bay. Uses in these tidelands are guided by the Refuge's management plan.

In 2004 the Wiyot Tribe, Table Bluff Reservation, acquired title to approximately 61.5 acres of Indian Island north of Highway 255, upon conveyance of title by the City of Eureka. The Wiyot lands include upland areas, marshlands, and tidelands. The Tribe's status as a sovereign government entity creates intergovernmental responsibilities with respect to baylands management, and the District, together with the Tribe, will develop additional working understanding with respect to tribal relations as the HBMP is implemented.

The District expects to work collaboratively with the cities, the Tribe, and the Refuge to assure that the policies in the cities' General Plans, the Refuge's management plan, Tribal management plans, and the District's policies regarding the tidelands in Humboldt Bay are considered mutually and inclusively in decision-making regarding the management of the tidelands in the Bay. The District will seek to formalize working relationships with the cities, the Refuge, and the Tribe regarding tidelands management as part of the implementation of this Plan.

6.2 Areas of Secondary Interest

The District's area of secondary interest for the Plan, which includes the "Public Trust lands" near Humboldt Bay (that is, the additional lands that were subject to tidal action at the time California became a state, but which are now located behind levees and are no longer subject to the direct ebb and flow of the tides) are within the local land use jurisdiction of three other local agencies, the City of Eureka, the City of Arcata, and the County of Humboldt (the County exercises land use authority over lands outside the limits of the incorporated cities).

The District does not have regulatory authority within this secondary area of concern. This separation of regulatory responsibilities at the levees does not, however, reflect the fact that the underlying physical and biological processes that affect many of the District's concerns do not stop at the levees. That is, many of the District's interests, such as those in water quality and ecological productivity, extend throughout the area of secondary concern; actions within the secondary area of concern may affect District interests in the primary area substantially.

The General Plans of the cities of Eureka and Arcata, noted previously with respect to tidelands, also form the primary policy guidance for the cities' regulation of the lands in the District's secondary zone of interest that also are within the city limits for these cities. As noted above, these adopted General Plans include policy guidance for the cities that covers many of the elements addressed by this plan for District consideration.

The County of Humboldt is currently preparing an update for its own General Plan, including the Coastal Plan elements that implement the Coastal Act's requirements. The County's General Plan does not address tideland uses within Humboldt Bay, but the County's General Plan does regulate land uses throughout much of the Humboldt Bay region (i.e., the part of the region not within city limits) that lies within the District's secondary zone of interest. As with the cities, the District exercises no regulatory authority over these lands.[8]

The District expects to work collaboratively with the City or Eureka, the City of Arcata, and the County to identify the District's concerns for the Public Trust lands within the jurisdictions of these other local agencies. The District will identify its concerns on the basis of the policies in this Plan, and may offer suggestions for addressing the events or practices within the Public Trust lands; the District may, in addition, enter into agreements or "partnerships" with the cities and the County in support of city or County projects. The District does not, however, expect to be significantly involved in this expanded geographical area from a regulatory perspective.

[8] The District apparently would reclaim jurisdiction for any areas within the diked former tidelands that are returned to tideland status. That is, the restoration of former tidelands near Humboldt Bay apparently would restore the District's direct jurisdiction over the restored areas.

6.3 Areas of Tertiary Interest

As noted previously, activities that take place in the Humboldt Bay watershed may affect subjects identified in this Plan as direct or indirect concerns for the District. Subjects that might be included in this category include water-quality impacts within the watershed that affect physical or biological properties or uses in Humboldt Bay, potential direct or indirect effects on habitat for fish species that fall under District jurisdiction within Humboldt Bay, and similar relationships with primary management concerns identified in this plan.

The District's interests in these subjects overlap with those of both cities and the County, and the policy framework identified in this Plan is intended by the District to complement the policy frameworks in the adopted plans of these other local agencies.

The District will monitor events in this tertiary area of concern, and may, if appropriate, comment to other governments regarding events or practices in this area that may significantly affect the District's management in Humboldt Bay. The District will identify its concerns on the basis of the policies in this Plan, and may offer suggestions for addressing the events or practices within the watershed; the District does not, however, expect to be involved in this expanded geographical area from a regulatory perspective.

7.0 Relationships with State and Federal Requirements

The District exercises jurisdictional responsibility over tidelands in Humboldt Bay. However, agencies of both the State of California and the federal government have constitutionally established authority over certain kinds of "resources" or certain kinds of regulatory concerns. These state and federal agencies enjoy limited or no direct control over potential land uses on privately owned lands, such as the authority exercised by the County and the cities. These state and federals agencies do, however, exercise land use control over lands that the agencies own, and the agencies also wield considerable authority over other uses in the Bay, because they act as regulatory agencies with the legal responsibility to implement one or more of a number of state or federal laws.

The authorities of these agencies overlap with the District's authority, in the sense that actions that are approved by the District (pursuant to the policies in this Plan) may also require approvals from one or more of these state or federal agencies (pursuant to policies established by statute or by regulation). While these agencies may amend or remove requirements established by regulation, these changes are subject to prolonged administrative processes. The requirements that are established in legislation may only be altered by additional legislative acts.

The result of this set of circumstances is that the District's desire to serve as a clearinghouse for applicants, and to streamline regulatory processes affecting Humboldt Bay (see Chapter 3.0 in Section III), will not be easily implemented, since many of the state and federal agencies may have regulatory requirements that are legislatively established or are otherwise difficult to alter.

The following brief summaries reflect the general authorities and concerns of several state and federal agencies that are particularly germane for activities in Humboldt Bay. It is stressed here that the following summaries are not intended to fully describe the roles, responsibilities, or authorities of any of the named agencies as they exist at the present time or may exist in the future. In implementing this Plan, the District will seek consensus among the agencies where agency concerns overlap with those covered by the Plan. In implementing this Plan, the District may seek to develop formal arrangements (e.g., memoranda of understanding, etc.) or informal processes (e.g., collaborative development of application standards for District actions that also address the requirements of other agencies) with various agencies to implement the policies in this Plan where the roles of those agencies and the District's management interests coincide.

7.1 State Agencies

While many state agencies may have relatively minor regulatory concerns that might arise for specific aspects of Humboldt Bay's management (e.g., the concerns of the State Historic Preservation Office, with respect to impacts to historical and archaeological resources),

the following selected agencies may assert substantial control over aspects of the Bay's management because of the requirements of California laws (it should be noted that these agencies also have other roles that are not described here).[9]

7.1.1 California Coastal Commission

The Coastal Commission is a significant regulatory agency with respect to Humboldt Bay. The Coastal Commission's powers, and the subject areas that the Commission regulates, are identified in the 1976 California Coastal Act (Public Resources Code Section 30000 *et seq.*). Many of the actions and concerns that are the District's responsibility pursuant to its establishing legislation are also subject to regulation under the Coastal Act.

The Coastal Commission's jurisdiction includes the Public Trust lands that make up both the District's area of jurisdiction (the Plan Boundary) and the District's Sphere of Interest. The Coastal Act's coverage includes essentially all of the "coastal-dependent uses," conservation concerns, and public recreation concerns that are the District's concerns.

The Commission retains "original jurisdiction" over the Public Trust lands in Humboldt Bay with respect to the Coastal Act. The Coastal Commission's authority does not pre-empt the District's authority with respect to managing Humboldt Bay pursuant to District responsibilities. However, projects that are authorized by the District are subject to a separate, independent permit review by the Coastal Commission, in which the standard of review is the Coastal Act. Coastal Commission reviews do not always result in approvals for projects that meet local jurisdiction requirements, resulting in differing results for the same project. Thus, differences between Coastal Commission approval requirements and those of the District and other local agencies have emerged as a concern with respect to Bay management.

[9] It should also be noted that there are state agencies that have little or no regulatory authority, such as the California State Coastal Conservancy or the Department of Boating and Waterways, which have substantial influence on actual management or development actions through their requirements for awarding funds. These agencies are not considered in this Section in detail.

7.1.2 California State Lands Commission

The State Lands Commission (SLC) retains an oversight role with respect to California's sovereign lands. The Commission's specific regulatory areas include offshore oil and gas development, marine oil terminals, ballast water regulation, and state lands leasing and permitting. While the District is legislatively authorized to manage the lands that have been transferred to District ownership, the SLC retains the legal right to intervene in the management process for Humboldt Bay tidelands if the SLC determines that an action taken, or proposed to be taken, by the District may be inconsistent with the SLC's perspectives regarding Public Trust uses of tidelands.

The District generally consults with the State Lands Commission when the District considers proposals for uses of Humboldt Bay tidelands. Copies of draft environmental documents prepared pursuant to the California Environmental Quality Act (CEQA) for proposed tidelands uses are also circulated to the SLC. Owing to the long-standing working relationship between the District and the SLC, and to the District's understanding of the requirements of SLC concerns, the SLC generally accedes to the District's determinations about tidelands uses.

7.1.3 California Department of Fish and Game

The California Department of Fish and Game (CDFG) is a trustee agency for fish and wildlife resources under California law. The Department generally lacks direct permit authority for activities that are subject to the District's jurisdiction. The CDFG Marine Region is, however, directly involved with ocean-related concerns in the Humboldt Bay area, including fishing-related and aquaculture-related activities that are subject to the District's direct jurisdiction. The Department also requires "agreements" from applicants for alterations of stream or lakebed crossings. The Department interprets and enforces the requirements of the California Endangered Species Act (ESA) and other state laws and regulations within Humboldt Bay, and provides comments to the relevant federal agencies pursuant to the federal ESA and other federal

laws. The Department also exercises law enforcement powers with respect to California's fish and game codes, including both sport and commercial fisheries (including shellfishing) and hunting.

The CDFG regulatory involvement in the District's management of Humboldt Bay is indirect. However, as the state's primary trustee agency with respect to fish and wildlife resources, the Department sends its judgements about proposed management activities or projects to other state agencies (including the Coastal Commission and the SLC) and to federal agencies with responsibility (see below). The Department therefore exercises considerable influence over planning and management activities within the District's areas of jurisdiction and interest.

The Department is responsible for managing four wildlife areas on or in close proximity to Humboldt Bay. Like other such throughout the state, these areas were acquired for protection and enhancement of wildlife habitat, the protection of sensitive species, and to provide public outdoor recreational use and access opportunities, including hunting, fishing, hiking, birdwatching, and nature study.

7.1.4 North Coast Regional Water Quality Control Board

The North Coast Regional Water Quality Control Board (RWQCB) is the primary water quality regulatory agency in the Humboldt Bay region.[10] Owing to an agreement between the state and federal governments, the RWQCB interprets and enforces both the relevant California water quality law [the Porter-Cologne Act (California Water Code, Division 7)[11]] and the federal Clean Water Act sections regarding water quality. The Regional Board has adopted a "basin plan"[12] that identifies "beneficial uses" for the Humboldt Bay watershed; these identified uses and the water quality criteria in the Basin Plan constitute the primary water quality standards for Humboldt Bay (although California Department of Health Services standards affect such uses as aquaculture production).

The RWQCB also has a role in the implementation of the wetland regulatory process carried out under the federal Clean Water Act by the U. S. Army Corps of Engineers (see below). Section 401 of the Clean Water Act requires a "certification" by state water quality regulators that permits granted pursuant to Section 404 of the Act are consistent with the state's water quality laws.

7.1.5 California Resources Agency

The Resources Agency consists of more than 30 departments and subsidiary entities; generally, the agency is responsible for conserving, enhancing, and managing the state's natural and environmental resources, including parks, wildlife, minerals, lands, and historic states. The Department of Parks and Recreation is among the several Agency departments that directly provide recreational areas and opportunities; others provide regulatory oversight, financial assistance, and resource protection functions. The Department of Parks and Recreation is a cooperating agency with the Bureau of Land Management (BLM) in the management of the Samoa Dunes Recreation Area, particularly for the management and funding of off-highway vehicle (OHV) activities through its Off-Highway Motor Vehicle Recreation Division.

7.2 Federal Agencies

A number of major federal laws affect or apply to proposed management or development proposals for Humboldt Bay; as was true for state laws, a number of federal agencies wield substantial authority. The following brief synopses address some of the roles performed by federal agencies that affect the management of Humboldt Bay. Additional federal

[10] The significance of this fact should not be underestimated. The Regional Board is the designated agency for regulating water quality pursuant to the Porter-Cologne Act. While the District may adopt policies or programs to assist in achieving desired water quality goals, the goal-setting responsibility and the regulatory authority to achieve the water-quality goals reside in the Regional Board, not in the District.

[11] The Act is available online at URL: http://www.swrcb.ca.gov/water_laws/docs/portercologne.pdf (viewed February 2007).

[12] The Plan is available online at URL: http://www.swrcb.ca.gov/rwqcb1/programs/basinplan/basin.html (viewed February 2007).

agencies have regulatory roles that are less expansive than those summarized here.

7.2.1 U. S. Army Corps of Engineers

The U. S. Army Corps of Engineers (Corps) is involved in two separate and significant ways in Humboldt Bay's management. The Corps is the federal agency that funds and carries out maintenance dredging in the channels and basins in Humboldt Bay.[13] Without the Corps' involvement, it is unlikely that Humboldt Bay would be able to function for an extended period as a harbor for commercial shipping vessels. Moreover, the maintenance dredging performed by the Corps in the Entrance Bay channels is often extended to the existing marinas, and it is possible that without the Corps' role that even small craft uses in Humboldt Bay would be more limited. Finally, the Corps is responsible for maintaining the jetties protecting the entrance to Humboldt Bay.

The other major role that the Corps plays in Humboldt Bay results from the Corps' primary regulatory role in implementing the federal permit processes required pursuant to the Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The Corps exercises an independent permit authority over uses in Humboldt Bay that are subject to the District's jurisdiction. Generally the Corps' reviews are carried out following approvals of proposed uses by the local jurisdiction (such as the District). As with the Coastal Commission, differences in review standards between those used by the District and those of the Corps have sometimes been an issue.

7.2.2 U. S. Fish and Wildlife Service

The U. S. Fish and Wildlife Services (FWS), an agency of the Department of the Interior, is a federal trustee agency for wildlife (and some fishery) resources, and provides advisory comments to the Corps and other federal agencies regarding proposed actions before those agencies, including state and private actions that include federal participation or approval, pursuant to the Fish and Wildlife Coordination Act. The primary role that FWS plays in Humboldt Bay's management stems from the FWS's role in working with the public and other federal agencies in the recovery of species listed under the requirements of the federal Endangered Species Act (ESA) for wildlife, plants, and some fish. The FWS's regulatory role in the District's management of Humboldt Bay is relatively indirect, although there are some plant species that occur in salt marshes which fall under District jurisdiction, and there is at least one (non-commercial) fish species that occurs in tidal waters subject to District authority.

The FWS is also a land-managing agency. In the Humboldt Bay area, the FWS manages the Humboldt Bay National Wildlife Refuge (NWR), which consists of several non-contiguous units adjacent to Humboldt Bay and its tributaries. From north to south, the Humboldt Bay NWR units are: Lanphere Dunes, Ma-le'l Dunes, Jacoby Creek, Eureka Slough, Indian Island, South Bay, White Slough, Salmon Creek, Hookton Slough, and Table Bluff. The refuge offices and visitor center are located the Salmon Creek Unit, adjacent to the South Bay. Humboldt Bay NWR conserves and enhances wetland and upland habitat values in and around Humboldt Bay for many species, and also provides wildlife viewing, environmental education and interpretation, hunting, and fishing opportunities. The Humboldt Bay NWR protects and enhances wetland and Bay habitats for migratory waterbirds, especially Pacific brant (*Branta bernicla*). The Lanphere and Ma-le'l units protect sensitive dune and estuarine plant communities and endangered species. The Hookton Slough Unit includes a public Bay-access facility for small, non-motorized watercraft.

7.2.3 NOAA's National Marine Fisheries Service

NOAA's National Marine Fisheries Service (NMFS), an agency in the Department of Commerce, is responsible for implementing portions of several federal laws that overlap with District interests. NMFS's primary responsibility is the stewardship of the nation's living marine resources and their habitats.

NMFS achieves its responsibility through authority

[13] The Corps was the federal agency that funded the majority of the costs for, and subsequently the agency that carried out, the deepening project in Humboldt Bay in the 1990s.

under several federal laws, including consultations regarding "take" of species regulated by the federal Endangered Species Act (ESA). As noted in Section II, there are at least three such species in Northern California coastal waters; in consequence, NMFS is involved in estuarine ecosystems, including Humboldt Bay. The primary role that NMFS plays in these contexts is effectively related to the ESA regulations affecting the Corps' Section 404 permit process.

NMFS also has additional roles in Humboldt Bay, related to the federally established Magnuson-Stevens Act requirements that NOAA Fisheries craft recommendations for "Essential Fish Habitat" (EFH) for species covered by management plans prepared pursuant to that Act. There are 25 fish species that are covered by one or more of three management plans that occur in Humboldt Bay.

The role that NMFS will play in Humboldt Bay management is evolving. Some habitat for some of the fish species subject to NMFS oversight may be directly affected by activities that are under the District's jurisdiction (see Section II). NMFS also has responsibilities under the federal Marine Mammal Protection Act and the Fish and Wildlife Coordination Act.

7.2.4 U. S. Coast Guard

The Coast Guard, formerly in the Department of Commerce and now in the Department of Homeland Security, is responsible for many aspects of marine safety in Humboldt Bay. These responsibilities include the primary responsibility for marine search and rescue operations in and outside of Humboldt Bay. Other significant Coast Guard responsibilities include monitoring and maintaining navigational safety and aids to navigation in and outside of the Bay, monitoring and responding to marine pollution events, and monitoring and addressing the potential threats to marine and estuarine waters resulting from exotic species.

Because a number of the District's management concerns overlap with the Coast Guard's areas of federal responsibility, the District maintains working relationships with the Humboldt Bay units and with the 11th District headquarters in Alameda.

7.2.5 Bureau of Land Management

The Bureau of Land Management (BLM), an agency in the Department of the Interior, administers public lands for multiple uses, including outdoor recreation. There are 15 BLM field offices responsible for lands in California; the local office which includes the Humboldt Bay area is located in Arcata. In addition to land management responsibilities, the BLM also administers various federal programs, including those related to the Recreation and Public Purposes Act and the Payments in Lieu of Taxes Act. Under the latter program, hundreds of thousands of dollars in payments are made annually to Humboldt County to compensate for revenue losses from tax-exempt federal lands. In the Humboldt Bay area, the BLM administers substantial public land areas, including the Samoa Dunes Recreation Area on the North Spit, and, in conjunction with other agencies, the South Spit Cooperative Management Area, as discussed further in Section II.

7.3 Independent Governments

7.3.1 Wiyot Tribe

The recent acquisition by the Wiyot Tribe, Table Bluff Reservation, of approximately 61.5 acres of land within the Humboldt Bay watershed establishes a degree of uncertainty regarding the long-term management of these lands. The Wiyot Tribe is recognized by the federal government as a tribal organization under the general protection of the federal government, with sovereign rights of self-determination. The Tribe's ownership of land in the Bay does not, *per se*, indicate that the land would warrant management differently from land held by other landowners, and the HBMP's policies would apply to these lands as to other lands. Should the Tribal lands be brought under federal trust status, then the policies in this Plan would no longer apply (nor would the Coastal Act or other local or state laws).

The District will work with the Tribe to develop

a mutual understanding of shared trust interests. The Tribe has expressed concern that the District should adopt policies that appropriately emphasize cultural resources and environmental resources that are important for Tribal members. In addition, the Tribe has expressed concerns regarding decision-making processes, and wishes to assure that Tribal interests are considered when siting potential activities that may be harmful to people or to the environment (i.e., considerations generally identified as an element of "environmental justice" concerns). The District is aware of the Tribe's concerns, and the Humboldt Bay Management Plan recognizes the necessity of future direct contacts with the Tribe.

8.0 Humboldt Bay Harbor, Recreation and Conservation District Current Strategic Plan

8.1 General Humboldt Bay Management Plan Objectives

As noted in the Executive Summary, the current ***Mission Statement*** for the Humboldt Bay Management Plan is:

Provide a comprehensive framework for balancing and integrating conservation goals and economic opportunities in a cooperative manner for the management of Humboldt Bay's resources.

The mission statement resulted from substantial discussion among members of the District's advisory committees during the development of the Strategic Plan and the HBMP. The following general objectives were identified in the Strategic Plan[14] to expand upon the mission statement. The objectives provide a more detailed description of the services and competencies that the District must develop and deliver in order to fulfill its mission:

- To represent the various constituencies equally and fairly within the responsibilities as stated in the enabling legislation
- To coordinate and provide leadership to federal, state and local entities on issues relevant to the District mission
- To promote regulatory and legislative action favorable to the District
- To expand and promote the economic and entrepreneurial activities of Humboldt Bay that are compatible with the District's adopted Management Plan and/or other related documents
- To generate adequate revenues to fund on-going District programs
- To manage all tide and submerged lands within the District's jurisdiction
- To promote and create recreational opportunities within the District's jurisdiction that are compatible with the District's adopted Management Plan and/or related documents
- To promote the protection of the bay and other tidelands
- To promote public knowledge of the bay
- To improve public awareness of and confidence in the District, its Commissioners and its staff
- To attain a high level of competency and efficiency in the operation of the District
- To regularly update the District's operating and long range plans

8.2 Strategic Plan Vision Statement

The Strategic Plan's ***Vision Statement*** is:

Bay leadership for the benefit of all

8.3 Strategic Plan Direction

8.3.1 Harbor

- Identify the need for permit process streamlining of historic uses of the bay and its margins with the overall goal of maintaining historic uses that are compatible with the findings of the Humboldt Bay Management Plan and Harbor Revitalization Plan.

[14] The Strategic Plan, updated by the District at five-year intervals, provides programmatic recommendations for District actions, but the Strategic Plan does not include specific policy directives. The Strategic Plan development process is an internal District planning process, incorporating substantial public involvement, but the recommendations developed in the process are implemented following their incorporation in the Humboldt Bay Management Plan.

- Identify and implement those elements of the Harbor Revitalization Plan, which would be needed to build the foundation for a real increase in the cargo handling capacity of the bay.

8.3.2 Recreation

- Facilitate a substantial increase in recreational facilities available throughout the District.

8.3.3 Conservation

- Provide leadership in enhancing and protecting the bay environment.

Based on the authority provided to the Humboldt Bay Harbor, Recreation and Conservation District in Appendix II of the California Harbors and Navigation Code, and the direction provided through the District's 2002-2006 Strategic Plan, the District has the statutory authority and support to pursue planning efforts affecting Humboldt Bay.

Ultimately, information contained in the Humboldt Bay Management Plan could, wholly or in part, become an updated amendment to the Humboldt Bay Master Plan, an amendment to ordinances, and provide policy and regulatory guidance to the District's Board of Commissioners.

9.0 Relationship with Other Plans

The County of Humboldt, the City of Eureka, and the City of Arcata planning jurisdictions overlap the District's "Sphere of Interest" (SOI). Both cities, as well as the County, have prepared and adopted the state's required general plan, as well as a Local Coastal Plan (LCP) for property within the coastal zone. As required by the California Coastal Act, the California Coastal Commission (CCC) provides oversight for the LCPs. Once the CCC certifies these plans, cities and counties may issue development permits.

The Humboldt Bay Management Plan has been prepared within the framework established by the Humboldt Bay Master Plan (1975). The Humboldt Bay Management Plan examines the guidelines established in the Humboldt Bay Area Plan (1982), the Humboldt County General Plan (1984), the current Eureka City General Plan, the City of Arcata General Plan, and other appropriate agency management plans for lands falling within the HBMP SOI to determine consistent land management techniques and identify areas where conflicts may exist. Locally adopted coastal plans implement statewide coastal management guidance within local regions. The standards for local coastal plans are the requirements in the Coastal Act, as interpreted by the Coastal Commission; local coastal plans map and provide specific guidance on issues identified by the Coastal Act. Generally, the Humboldt Bay Management Plan will be read and implemented in terms of its consistency with the requirements of the Coastal Act.

The Humboldt Bay Management Plan will also operate alongside a range of other plans and policies at the federal, state, and local levels. The HBMP is intended to establish a policy framework to assist and guide the integration of these plans and policies and

Curious Harbor Seal

other relevant planning and decision-making activities. The HBMP prescribes custom tailored management initiatives to meet the challenges facing Humboldt Bay's resource managers, utilizing a comprehensive ecosystem-based approach. Therefore, the result is intended to be a balanced but protective public policy framework that will assure that Humboldt Bay continues to provide a wide range of beneficial uses, conservation values, and continued enjoyment by future generations of Californians.

10.0 Development of the Humboldt Bay Management Plan

In order to collect and analyze the input necessary for the development of a useful management plan, the District formed the Humboldt Bay Management Plan Task Force (Task Force) made up of agency land managers and representatives of various stakeholder groups within the sphere of interest.

Over the last several years, the Task Force has worked on integrating existing scientific data, citizen input, and agency mandates into a comprehensive management plan. Using a "bottom up" approach, the Task Force heard public comments first, as knowledgeable citizens shared their responsible visions at a series of stakeholder workshops. Stakeholder groups identified by the Task Force are detailed in Table 10-1. Stakeholder workshops were held in 2001-2002 to address the following topics: commercial/ industrial waterfront development, agriculture, environment, recreation, education, commercial fishing, and mariculture. Citizen participation at these workshops lead to the input of more than 350 ideas, which theTask Force boiled down into the following issue categories for Humboldt Bay Management Plan to address:

- Habitat and Living Resources
- Human Activities and Competing Uses
- Water Quality and Sediment Control
- Public Participation and Education
- Research and Monitoring

Humboldt Bay Harbor, Recreation and Conservation District, Annual Maritime Expo fishermen/Coast Guard tug of war

Dredge Nehalen

10.1 Key Milestones in the Evolution of the Humboldt Bay Management Plan

August 5, 1997	Interagency Committee Formed
January 22, 1998	GIS mapping efforts under way
February 26, 1998	HSU contract to create parcel map
August 24, 1998	EPA Grant awarded to fund GIS efforts
July 8, 1998	CSU GIS Natural Resources
November 1999	HBMP Task Force Formed
February 24, 2000	HSU GIS Physical Characteristics
May 25, 2000	CA Coastal Conservancy Grant funded for GIS work and analysis
December 7, 2000	CSU Contract Amendment
January 25, 2001	HSU Amendment Web-Based Data Repository
December 11, 2001 through May 2002	Stakeholder Meetings Held
June 11, 2004	Contract with consultants Roberts, Kemp and Associates
March 17, 2005	Public Release, Draft Humboldt Bay Management Plan
April 28, 2005	Comment period closes for Draft HBMP
August 2005	Notice of Preparation for Draft EIR, HBMP
April 2006	Public Release, Draft EIR
August 2006	Board of Commissioners adopts Humboldt Bay Management Plan

The U.S. Coast Guard cutter Barracuda *and the* Madaket *open for tours during Humboldt Bay Maritime Expo*

Table 10-1. Original List of Bay Stakeholders

Landowners/Land Managers
- Louisiana-Pacific
- Simpson Timber Company
- Sierra-Pacific Industries
- CA Department of Fish & Game
- Humboldt Bay National Wildlife Refuge
- Pacific Gas & Electric
- Northcoast Railroad Authority

Recreation Groups
- United Anglers
- Klamath Management Zone Coalition
- Humboldt Bay Yacht Club
- CA Waterfowl Association
- Ducks Unlimited
- HSU Crew/University Center
- OHV Clubs
- Humboldt Surfriders
- Humboldt Rowers Association
- HumBoats

Environmental Groups
- Audubon Society
- Northcoast Environmental Center
- Sierra Club
- HSU/Wildlife Care Center
- Friends of the Dunes
- Dunes Forum

Academic/Education
- Local schools
- Humboldt State University
- College of the Redwoods
- UC Cooperative Extension

Aquaculture
- Coast Seafoods
- Aqua Rodeo
- Kuiper Mariculture
- North Bay Shellfish

Other NGOs
- Humboldt Bay Watershed Advisory Committee
- Redwood Community Action Agency

Waterfront Commercial/Industrial
- Chamber of Commerce
- Marine Suppliers
- Humboldt Builders Association
- Waterfront Landowners Association
- Citizens for Port Development
- Longshoremen
- Humboldt Seatrade

Commercial Fisherman
- Humboldt Fishermen's Marketing Association
- Local Herring Fishermen
- Local Rock Crab Fishermen

Local Agencies & Committees
- City of Eureka
- City of Arcata
- County of Humboldt
- Humboldt County Fish & Game Advisory Committee

Federal/State Agencies
- USFWS/Humboldt Bay National Wildlife Refuge
- North Coast Geographic Information Cooperative
- Caltrans
- US Army Corps of Engineers
- CA Coastal Conservancy
- CA Coastal Commission
- CA Department of Fish and Game
- US Environmental Protection Agency
- Humboldt County Environmental Health
- Humboldt County Public Health
- US Army Corps of Engineers
- California Department of Food and Agriculture

Agriculture
- Farm Bureau
- Humboldt County RCD
- Cattlemens Association
- Dairy & Beef

10.2 Task Force Contributions

The District's Board of Commissioners sought to involve Bay stakeholders in the planning process early in the Plan-development process. Stakeholders were asked to participate from diverse backgrounds, and included groups with economic, recreational, environmental, or other stakes in the health and viability of the Bay. Representatives from the business community, agriculture, mariculture, recreational and commercial fishermen, the educational community, cultural and environmental organizations, citizens, and others were invited to participate in the development of the management plan for Humboldt Bay. Table 10-2 below details the stakeholder group information.

Table 10-2. Stakeholder Group Information

Stakeholder Group	Workshop Date	Attendees	Comments/ Actions Suggested
Commercial/ Industrial	12/11/01	16	44
Agriculture	1/8/02	31	41
Environmental	1/22/02	24	79
Recreation	2/12/02	26	61
Education	2/26/02	5	44
Commercial Fishing	3/12/02	13	38
Mariculture	4/9/02	9	51
Totals		124	358

The District, early in the development process of the Management Plan, sought the public to have a voice in the decision-making process. Stakeholder meetings were held early in the planning process so that the public was given the opportunity to have input; the Task Force developed management policies based on this, rather than merely receiving comments on the prepared document at the end of the process (as in a top-down approach).

The Task Force thus heard from diverse groups, offering a wide perspective of opinions, knowledge, and vision. Issues discussed at stakeholder meetings require both planning for the future and working cohesively for solutions. They require the input of local government, businesses, groups, agencies, and citizens. It is the cumulative effect of everyone's individual actions that may threaten or damage the Bay's ecosystem, and it will likewise take collective action to effect positive change. Planning for the future must take into account what is valued, balancing values and thoughts and beliefs to find a common-sense middle ground.

For positive management and protection to occur within Humboldt Bay watershed, three things need to happen:

- Awareness — People need to be informed about the issues facing Humboldt Bay. While many people understand that they live in a watershed, they are not quite sure what it is or which one they live in. Awareness of the interconnectedness of estuaries and waterways must be fostered.
- Motivation — People need to understand how their behavior impacts, positively or negatively, Humboldt Bay and its resources.
- Action — People need to be given an opportunity to change their behaviors (increase the positive, decrease the negative) that play a role in Humboldt Bay issues.

10.3 Plan Development

Resource management in the 21st Century appears fundamentally different from resource management in the past. Members of local communities have broadened the knowledge base as they became increasingly involved with management decision-making; no longer is resource management an exercise of having "managers" applying technical knowledge through mandated regulations and enforcement. In the current process, local communities have been helped to become true stewards of their own resources. Local communities are now tackling problems such as pervasive habitat loss, diffuse sources of pollution, and changes to freshwater inflow through a coordinated regional approach. Problems such as these are complex and interrelated; they involve major water bodies like estuaries, but they also creeks, sloughs, rivers, and entire watersheds that drain into our estuaries. As a result, ecosystem-based management has become a key to pursuing economic growth that is compatible with maintaining the natural environment.

The Management Plan development process used the National Estuary Program's (NEP) stakeholder participation process as a model to develop the Humboldt Bay Management Plan, in order to protect, restore, or enhance the quality of water, sediments, and living resources.

This plan is designed to complement and coordinate existing resources management programs and plans. It will not affect private property rights, nor supersede existing local, state, or federal authority in any way. Rather, the management plan will attempt to focus the Districts' limited financial and technical resources in a goal-directed manner to effect resource management over the ecosystem.

The mission statement helped to develop the vision for the Management Plan and continued to serve as a reminder of the interdependent roles of the economy and environment, and thus the ultimate goal to attain a sustainable balance between the needs of the environment and those of the human community on the North Coast.

Many of the management issues for Humboldt Bay are covered by the authority or responsibility of agencies other than, or in addition to, the District, and collaborative approaches are required. A full understanding of the interactions of the complex ecosystems that comprise Humboldt Bay remains elusive. It is clear that there are many gaps in the technical knowledge about the Humboldt Bay environment, but management may (in fact, must) proceed in the absence of complete knowledge. While it is the intent of this Plan to identify and coordinate efforts and resources to close data gaps in a timely manner, resource managers, policy makers, and local governments in Humboldt County must effectively manage the local environment based on the best science available while providing ample public participation.

10.4 Plan Organization

This Humboldt Bay Management Plan consists of three elements, the Executive Summary, Volume I, and Volume II. Volume I of the Management Plan includes three sections. This document (Section I) introduces the background, history, and need for the Plan. It describes the District's three areas of management responsibility and concern; it also describes the "three bays" concept. Section I further describes the role and make-up of the Management Plan Task Force and the development process of this Plan.

Sections II and III of Volume I address the District Board of Commissioners' three main areas of focus and responsibility — harbor, recreation, and conservation. Section II – State of the Bay – provides chapters that describe existing resources and uses (harbor, recreation, and conservation) within the plan area to the extent necessary to provide a context for the policies in Section III.

Section II includes a general summary of the physical and biological conditions present in Humboldt Bay based on previously published documents and data developed early in this planning process. It reflects general changes in understanding that have arisen in recent years about the relative significance of information not previously known or considered significant. New information has been incorporated based on recent publications and ongoing studies and research. This discussion is not encyclopedic in nature, but provides a synthetic portrait of what is now generally known about Humboldt Bay, its watershed, and the nearby Pacific Ocean.

Section II addresses specific setting conditions for the District's three focus areas. The Harbor chapter includes shipping and non-cargo uses; some of the information in the Harbor chapter has been abstracted from the recent Humboldt Bay Harbor Revitalization Plan and other recent planning documents. The Recreation chapter identifies recreational uses and opportunities throughout the Humboldt Bay sphere of interest. The discussion in the Conservation chapter is focused on important environmental conditions and resources; the topics in this chapter are key issues for the policy document (Section III). As in other setting sections, this chapter presents the current understanding of basic and applied scientists, agency

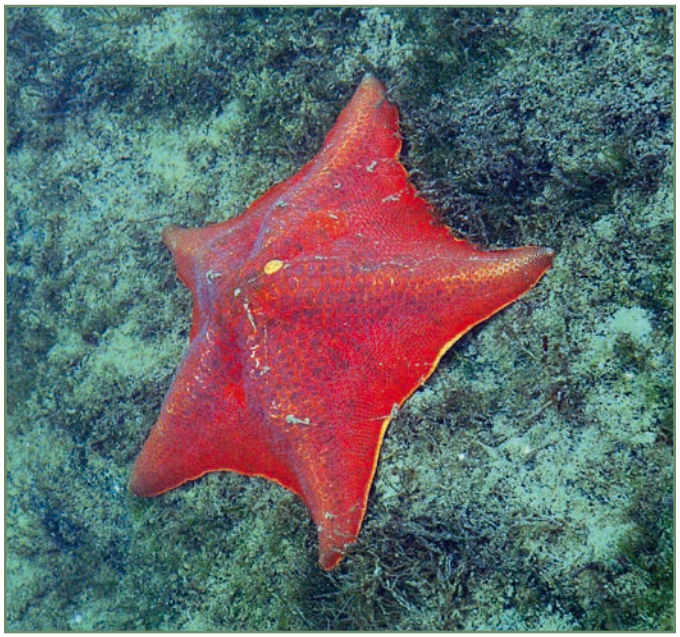
The Humboldt Bay Maritime Expo provides an opportunity to meet a wide variety of bay professionals serving the community


Harbor Seals haul out

staff, and informed members of the public regarding ecological processes and the biological and physical conditions in Humboldt Bay that have been used to develop the policy framework in Section III.

Section III identifies the policy directions and an implementation program for the District's management actions in Humboldt Bay. The policies are organized by the three primary management areas, the Harbor (Chapter 3.0), Recreation (Chapter 4.0), and Conservation (Chapter 5.0). Section III includes (Chapter 2.0) water use designations that will be used by the District in implementing the plan. In Chapter 6.0, specific implementation protocols are identified for action by the District's Board of Commissioners in order to enact and enable the Plan's recommendations. Section III concludes with a discussion of the basic approaches to implementing the plan, including the roles of the participants and the several procedural pathways for reviewing proposed projects and decisions.

Finally, the third element of the Management Plan, Volume II, provides a glossary, a copy of the District's enabling legislation, additional information pertaining to state and federal agencies, an overview of various statutes and regulations, a partial listing of selected species groups, maps, and public comment documents, including copies of the comments received by the District addressing the March 17, 2005 Draft HBMP.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Section II

State of the Bay

Humboldt Bay Management Plan

May 2007


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Chapter 1.0

Introduction

Section II of the Management Plan is a description of the "setting" for the Management Plan. That is, this Plan section presents necessary information to help District decision-makers and staff, decision-makers and staff from other agencies, applicants, and members of the public in understanding the policies in Section III. This section is not intended to serve as a reference manual about shipping, recreational uses, or any of the myriad natural history subjects that are germane for Humboldt Bay. The District determined early in the process of preparing this Plan that overly detailed depictions of the setting of the Bay would interfere with the appropriate focus of the Plan, which is the set of policies in Section III.

Chapter 2.0 of this Section looks at the Harbor, including, in a narrower sense, the Port of Humboldt Bay. Chapter 2.0 also considers the District, the lands that are owned by the District, and the District's existing management of these lands. Chapter 2.0 looks at the port-related uses of Humboldt Bay, many elements of which were well-addressed by the recent Harbor Revitalization Plan, as well as at fishing, aquaculture, and other non-port related maritime uses of the Bay.

Chapter 3.0 considers recreational activities and uses that occur in the Humboldt Bay region, including the possible inter-relationships among recreational uses and both harbor-related and conservation uses. Many of the recreational uses that take place in the Humboldt Bay region occur primarily on lands that are not under the District's jurisdiction, and Chapter 3.0 considers the roles of other agencies and a variety of interested private entities in planning for and realizing recreational uses.

South Bay looking North (Photo by Sy Beattie)

North Bay looking South

Great catch (Photo by Suzie Houser)

Agricultural lands around the bay provide open space and rich pasture.

Loading a chip barge

Great Egret (Photo by Solon Holstein)

Chapter 4.0 provides a brief synopsis of the environmental and ecological relationships underlying the most important conservation functions in Humboldt Bay. The synopsis updates well-established studies where information is available, but a primary conclusion of the conservation setting is that there remains much that is unknown about the ecosystem elements in the Bay, including how they are related to many of the current or potential uses that could occur in the Bay.

Humboldt Bay is a major coastal embayment, but the Bay is significantly influenced by events and practices within the larger watershed in which it is a part. The District lacks direct jurisdiction over land areas and land use practices in the watershed that affect the Bay's biological resources, its water quality, and even its ability to provide safe navigation. Therefore one of the primary conclusions of this Section of the Plan is that "managing" Humboldt Bay is not truly possible unless the management is distributed throughout the Bay's watershed.

The District is cognizant of the interrelatedness of the concerns described in this Section, and the District has identified a need for cooperative and collaborative approaches to addressing the watershed-wide nature of a number of the concerns identified in this Section (see the policy considerations in Section III of the Plan).

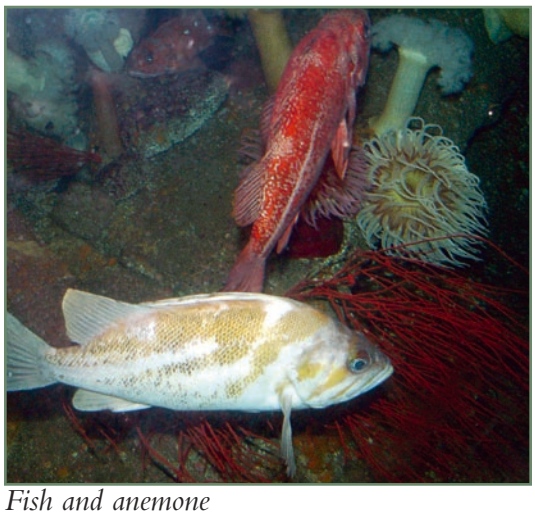
The implementation of this Management Plan includes commitments by the District to assume responsibility for coordinating and facilitating additional research and educational efforts regarding the uses and resources of Humboldt Bay. The descriptions in this Volume are the beginning of the knowledge base that the District will need for managing the Bay.

Humboldt Bay Harbor Setting

Chapter 2.0

2.1 Introduction and Chapter Overview

This chapter of the Management Plan provides a summary of the general state of the commercial/industrial portion of Humboldt Bay, with an emphasis on harbor areas, activities, facilities, and management responsibilities within the waters and lands of the District's primary jurisdictional area. This chapter reviews the major harbor-related functions of Humboldt Bay, both as a working port and in the more general sense as a harbor, as related to the overall mission responsibilities of the District. The discussion is not meant to be a comprehensive treatment of all harbor-related functions, but rather to provide a context for the policies presented in Section III of the Plan.



Fish and anemone

Buffered from ocean waves and storms by the Samoa Peninsula/ North Spit and the South Spit, Humboldt Bay is a sheltered, generally shallow, coastal water body that is open to the ocean yet nearly surrounded by land. For more than a century, the natural attributes that have supported the use of the Bay as a harbor – including the entrance, the water channels, and shoreline – have been modified, expanded, stabilized, and maintained in order to develop the Bay for safe moorings, commerce, and multi-modal transportation connections.

Today, Humboldt Bay continues to serve as a working port, capable of handling ocean-going vessels with domestic or international cargoes. Promotion of marine commerce was one of the main purposes behind the State legislation that created the Humboldt Bay Harbor, Recreation and Conservation District; accordingly, the District serves as the Port Authority for the Port of Humboldt Bay. Ports are important gateways for domestic and international commerce; the ports of California (largely dominated in terms of overall cargo by the ports in Southern California and the San Francisco Bay area) are particularly important economic engines to the State and to the nation. Of the approximately 185 ports in the United States, there are 25 ports on the West Coast and 11 major ports in California. The Port of Humboldt Bay is of strategic importance because it is the only deep-water shipping port between San Francisco, approximately 225 nautical miles to the south, and Coos Bay, Oregon, approximately 156 nautical miles to the north.

Rainbow over the fishing vessel Sea Wolf *in Humboldt Bay*

In addition to being a working port, Humboldt Bay also functions as a harbor for other, "non-cargo" uses. The commercial fishing fleet, recreational boaters, and other maritime activities all benefit from sheltered anchorage, maintained channels, marinas, waterfront facilities and services, and the armored shoreline of the harbor. The Bay is also the setting for important related uses, including mariculture. A variety of commercial businesses around the Bay support these activities.

An important part of the overall planning context for the harbor is the ***Port of Humboldt Bay Harbor Revitalization Plan*** (hereafter, Harbor Revitalization Plan), completed in 2003 by the District in conjunction with the City of Eureka and the County of Humboldt. The Harbor Revitalization Plan, important policy recommendations from which are incorporated as policy elements into Section III of this Management Plan, was aimed at identifying "a new and sustainable maritime focus" for the Humboldt Bay community. Some of the major recommendations from this plan pertaining to harbor use and future scenarios are discussed further in this chapter.

Also part of the planning context is the most recent update of the District's Strategic Plan, adopted in 2002, which suggested interim general directions for the District (prior to the Harbor Revitalization Plan and this Management Plan), based on recommendations from the Strategic Plan Task Force and comments from the public. The Strategic Plan, in addition to stating the need for both this Management Plan and the Harbor Revitalization Plan, identified a number of strategic direction statements for the District's three main areas of responsibility. With regard to harbor management, the Strategic Plan assigned a high priority to (1) "permit process streamlining" of compatible uses of the Bay and its margins and (2) implementation of elements in the Harbor Revitalization Plan that would build the foundation for an increase in cargo-handling capacity in the port.

As in the District's other main functional areas, management of port and other harbor activities is conducted within a context that requires consideration of other resources and uses in and around Humboldt Bay. Development, maintenance, and promotion of harbor-related activities must consider the District's other responsibilities in the areas of recreation and conservation, as well as corresponding land-side uses prescribed and administered by the two cities and the county. As discussed in Section I, the District has been authorized by the State to manage Humboldt Bay in ways and for uses that are consistent with its public trust responsibilities; the District is authorized to weigh, balance, and seek to resolve potentially competing or conflicting uses.

2.2 Port of Humboldt Bay

This section generally describes the main features that are necessary for the harbor to function as a working port, including the jetties at the Bay entrance, the bar and entrance channel, maintained shipping channels within the Bay, turning basins, shoreline protection and improvements, docks and other landside improvements, and key waterfront sites used for coastal-dependent industry.

2.2.1 Bay Entrance and Shipping Channels

Maintaining an improved entrance to the Bay and dredging the entrance area and major navigation channels in the Bay are necessary activities to accommodate safe and economically viable shipping by ocean-going vessels and barges. A system of dredged channels is maintained by the District and the Army Corps of Engineers. Dredge spoils from the entrance area and main channels of the harbor are removed to the Humboldt Open Ocean Disposal Site (HOODS), an offshore disposal area 3 to 4 nautical miles west of Humboldt Bay designated in 1995 by the U.S. Environmental Protection Agency.[1] Outside the main navigation channels, the District has oversight responsibility for periodic maintenance dredging at facilities such as Woodley Island Marina and the Eureka Public Marina; the City of Eureka is a cooperating agency for some maintenance dredging activities, and

[1] See the Federal Register Notice [Federal Register: September 28, 1995 (Volume 60, Number 188)] on the EPA website at http://www.epa.gov/fedrgstr/EPA-WATER/1995/September/Day-28/pr-180.html. Viewed February 2007.

private dock-owners may also share responsibility for dredging activities.

In 2000, the District and the Army Corps of Engineers completed the Humboldt Bay Channel Deepening Project, the initial phase of a long-term strategy for harbor revitalization. Channel deepening was conducted to improve navigation safety as well as improve the Port's competitiveness for marine trade. The competitiveness of any port is closely related to its ability to adapt to changes in the shipping industry, most notably the use of larger deep draft vessels. After deepening, the channels can accommodate larger vessels (although not the largest tankers or similar vessels); deeper channels also may reduce the need of some vessels to enter the Bay with light loads, thus potentially improving "vessel economics" (see the Harbor Revitalization Plan). Currently, the Bay can typically accommodate vessels in the "Panamax" class,[2] which is up to 750 feet LOA (length over all), approximately 110 feet in width (beam), and a total of approximately 50,000 deadweight tons.

In general, the channel system in Humboldt Bay consists of the entrance channel and turning basin, a northerly channel from the turning basin to North Bay and Samoa that forks around Woodley Island, and a southerly channel to Fields Landing (see Figure 2-1). The entrance to the Bay is protected by two rock and concrete jetties, first constructed in 1889. Numerous modifications and reconstructions have taken place on the jetties over the years, including the emplacement in 1971 of large concrete dolosses at the ends of the jetties, as well as further reinforcement in 1987. Humboldt Bar at the entrance of the Bay has a history and reputation of being a dangerous passage for boats; according to the Coast Pilot (NOAA 2005):

"Even with present improvements, mariners are still advised to use extreme caution on the bar and, because strong currents may be encountered, when approaching the abrupt turn at the outer end of the S[outh] jetty. The bar is smoothest during the last of the flood current, and it is often passable at this time and impassable 2 hours later, when the ebb current has set in. Mariners are advised to contact Coast Guard Station Humboldt Bay on VHF-FM channel 16 or 22A prior to transitting the bar. Caution should also be exercised inside the jetties due to the rapid change in the channel conditions. Deep-draft vessels are usually taken in and out of the bay at high tide if there is any swell on the bar because of the shoaling in the entrance channel."

The Bar and Entrance Channels extend from the open ocean, between the jetties that form the entrance to the Bay, to a turning basin at the head of Entrance Bay. The Bar Channel extends seaward from the Entrance Channel and is maintained at a depth of 48 feet; it is approximately 2,300 feet in length, and is 1,600 feet wide at the seaward end and 700 feet wide at the jetties. The Entrance Channel extends between the two jetties and is maintained at a depth of 48 feet. It is approximately 9,000 feet in length, and 500 feet wide.

The North Bay Channel, which has a width of 400 feet and depth of 38 feet, extends north from the entrance turn for a distance of approximately 18,500 feet, where it branches into the Eureka Channel and the Samoa Channel. The easterly fork is the 400-foot wide Eureka Channel, which serves the Eureka waterfront and consists of two segments: a 3,000-foot length at a depth of 35 feet and a 6,700-foot Inner Reach at a depth of 26 feet. The westerly fork, the Samoa Channel, which serves the industries on the Samoa Peninsula, is approximately 8,000 feet long, 400 feet wide, and 35 feet deep and ends at a turning basin. The Fields Landing Channel (or Hookton Channel), which serves Fields Landing and King Salmon, extends in a southeast direction from the Bay entrance; this channel is approximately 12,000 feet long, 300 feet wide, and 26 feet deep, and also ends at a turning basin.

2.2.2 Shoreline and Related Improvements

Approximately 15 percent of Humboldt Bay's shoreline is devoted to port-related, marine uses and activities (Strategic Plan 2002). Currently, approximately 4,873 linear feet of dock space available

[2] Refers to the largest size vessel that can be accommodated in passage through the Panama Canal.

in Humboldt Bay, divided among several industries, as discussed further below. Storage is available for covered and uncovered cargo and liquid bulk.

Adjacent to Humboldt Bay shipping channels are five operating terminals serving ocean-going dry-cargo vessels, and one oil dock. There are several other inactive terminals. The locations of these facilities are shown in Figure 2-1. Three of the six active cargo docks are located on the Eureka waterfront, two are located on the Samoa Peninsula, and one is located at Fields Landing. The Samoa docks are used principally by pulp mill activities on the Samoa Peninsula. The Eureka waterfront docks are used primarily for commercial shipping (wood products and refined petroleum products), and occasionally by U.S. Coast Guard vessels, cruise ships, other passenger vessels, environmental vessels, and U.S. Navy vessels calling on Humboldt Bay. The Humboldt Bay Forest Products dock in Fields Landing is used chiefly for log exports (Revitalization Plan 2003; Humboldt County Association of Governments 2004). Approximately 164 ships and barges entered the Port of Humboldt in 2004. Key coastal-dependent industrial facilities are discussed further in the next subsection.

Among the necessary harbor-related activities for the District and other users of waterfront areas are activities related to shoreline maintenance and dock, pier, and pilings repair, replacement, or removal. The City of Eureka, for example, has for many years conducted a variety of waterfront improvement projects, including projects to remove derelict piers, wharves, and docks and, in some cases, replace these structures with improvements aimed at revitalizing the historic Old Town area.[3]

2.2.3 Key Coastal-Dependent Sites

A number of waterfront areas around Humboldt Bay have a history of industrial use, particularly in parts of the Bay that are adjacent to the deep water channels on the waterfront side and adjacent to the railroad line (or a spur) on the upland side. Designation of coastal-dependent industrial sites is a function of local governments – the City of Eureka and the County of Humboldt – under their required General Plans and Local Coastal Plans, which are prepared

[3] See, for example, the project (approved by the California Coastal Commission and the Harbor District in 2000) to demolish dock and wharf structures and construct a 1,600-foot long public pedestrian boardwalk and dock complex along the City's waterfront between C Street and F Street [http://www.coastal.ca.gov/eureka/1-99-077.pdf (viewed February 2007)].

The Silver Shadow *visits Humboldt Bay*

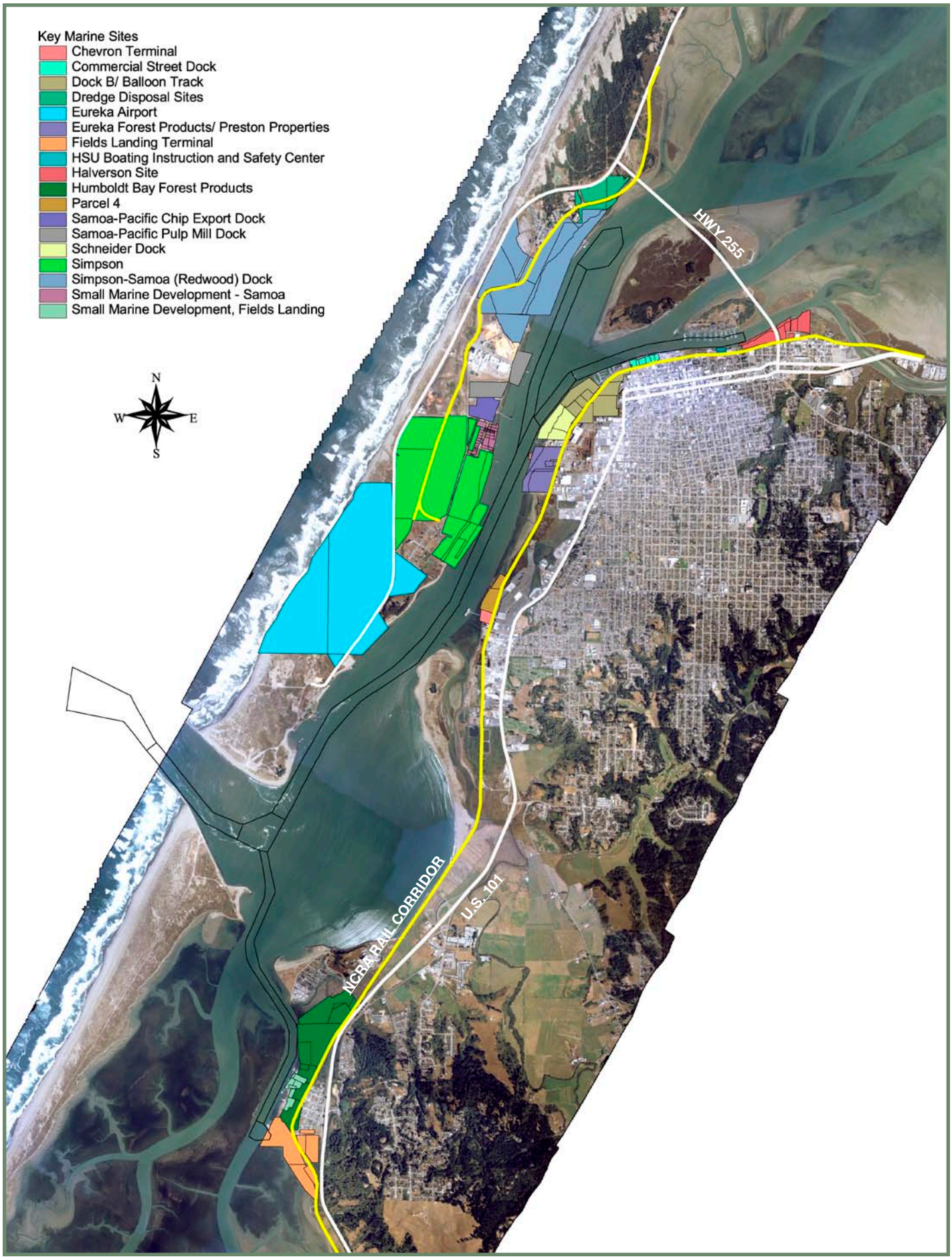


Figure 2-1: Key Marine Sites and Regions as defined in the 2003 Humboldt Bay Harbor Revitalization Plan

Figure 2-2: Port of Humboldt Bay Marine Terminal Properties—acreages are approximate

through processes that involve public participation and environmental review, and are typically implemented through zoning regulations and use permits. Like all forms of land use, coastal industrial uses change over time, in response to market conditions, land use and environmental requirements, and other factors; however, the designations in local, adopted planning documents continue to prescribe coastal-dependent land uses for many industrially suitable locations on the Bay.

Currently, as described in more detail in the Harbor Revitalization Plan, there are a number of "key" sites and facilities for coastal-dependent industries and port-related commerce. Sixteen key sites were identified, consisting of six sites with active cargo terminals, five sites with inactive cargo terminals, and five other industrial or commercial public sites (Table 2-1).

The key sites with active cargo terminals are virtually all in private ownership; most, with the exception of Humboldt Bay Forest Products on the Fields Landing Channel, are located on the North Bay Channel. All sites are zoned appropriately for coastal-dependent or industrial uses. One site, Humboldt Bay Forest Products, is designated as a Foreign Trade Zone;[4] the others could be eligible to receive that designation. All sites are located on, or have access to, the Northwestern Pacific Railroad line or spur.

Several of the key sites with inactive cargo terminals are in public ownership by the City of Eureka (Dock B waterfront parcels) or by the District (Redwood Dock waterfront parcels and Fields Landing Terminal waterfront parcels; the latter site does include an active boat repair facility and yard). All "inactive" sites are zoned appropriately for coastal-dependent or industrial uses. Dock B/Balloon Track, Fields Landing Terminal, and Redwood Dock are designated as a Foreign Trade Zones; the others could be eligible to receive that designation. All sites are located on, or have access to, the Northwestern Pacific Railroad line.

The "other" category of key sites is a set of miscellaneous properties that are either active or inactive; the City of Eureka owns some of all of the parcels at each site. Two sites (Humboldt State University Boating Instruction and Safety Center and Commercial Street) are located on the Inner Reach of the Eureka Channel; one site (Halvorsen/City) is located just beyond the Inner Reach; and the other two sites are located on the North Bay Channel. Of the five sites, the City Airport Property at nearly 350 acres (not including mitigation and recreation areas) is by far the largest site. The six-parcel Commercial Street-C Street Docks Site includes Coast Oyster Company, Pacific Choice Seafoods, and several City-owned parcels. Parcel 4, another City parcel, is undeveloped. The City Airport Property is designated as a Foreign Trade Zone; the others could be eligible to receive that designation. All sites are located on, or have access to, the Northwestern Pacific Railroad line or spur.

2.2.4 Marine Transport and Cargoes

As described more fully the Harbor Revitalization Plan, total port traffic on the West Coast overall has grown by 150 percent over the past decades; the growth in containerized cargo traffic greatly exceeds all other cargo types. Containerized cargo and automobile shipments are particularly important to ports with positive growth trends, such as the Southern California ports. Regarding other types of cargoes, bulk cargoes and general break-bulk cargo have grown slightly in recent decades, while lumber and forest products have declined by more than 50 percent.

The loss of forest product exports and domestic shipments has affected all ports from Humboldt Bay north to Washington. Historically, outgoing cargo from Humboldt Bay consisted almost exclusively of forest products exports, such as wood chips, wood pulp, lumber, and logs. Export demand has fluctuated over the years. In more recent decades, various circumstances have lessened production and output by the North Coast timber industry, with the result

[4] Foreign Trade Zones are secure areas that are physically within the United States but are considered outside the jurisdiction of U.S. Customs. Foreign Trade Zone No. 248 is sponsored by the City of Eureka, and is located on four designated sites: Site 1 – Dock B (City-owned, 7.1 acres); Site 2 – Samoa Peninsula (City-owned, 320.8 acres; Harbor District-owned, 66 acres); Site 3 – Fields Landing (privately owned, 62.3 acres; Harbor District-owned, 19 acres); and Site 4 – Eureka-Arcata Airport in McKinleyville (County of Humboldt, 50 acres).

Table 2-1. Key Coastal-Dependent Sites, Humboldt Bay.

Sites with Active Cargo Terminals	Sites with Inactive Cargo Terminals	Other Industrial, Commercial, and Public Sites
• Schneider Dock	• Dock B/Balloon Track	• Halvorsen/City of Eureka Sites
• Eureka Forest Products (Sierra Pacific)/Preston Properties	• Phillips Petroleum (formerly Tosco)	• Humboldt State University Boating Instruction and Safety Center
• Chevron Terminal	• Fields Landing Terminal Area	• Commercial Street/C Street Docks
• Humboldt Bay Forest Products	• Redwood Dock Site	• Parcel 4 (City of Eureka)
• Simpson Samoa Chip Export Dock	• Pulp Mill Dock	• Eureka Airport Property
• Fairhaven Terminal		

(Source: Modified from the *Port of Humboldt Bay Harbor Revitalization Plan*, 2003)

that, after helping to spur a peak in Humboldt Bay waterborne commerce in 1991, wood products exports have generally been on the decline, and lumber exports are nearly non-existent.

Today, the incoming cargo to Humboldt Bay includes unprocessed logs from New Zealand and Canada, as well as imported wood chips. Overall, according to the Harbor Revitalization Plan, for all commerce flowing through Humboldt Bay facilities, exports (which are declining, but still dominated by forest products) and domestic receipts (e.g., refined petroleum products and woodchips) are currently the dominant cargoes in waterborne commerce in Humboldt Bay (Table 2-2).

Marine transport of goods also has been affected by changes in the shipping industry (Harbor Revitalization Plan 2003; HCAOG 2004). Larger, deep-draft vessels are becoming more common for moving cargo via the Pacific Ocean shipping lanes; while these vessels have higher cargo capacities, they also require deeper and wider channels and turning basins. An assessment by the Army Corps of Engineers in 1995 of the feasibility of deepening and widening of Humboldt Bay[5] found navigation concerns in two areas: (1) safety and efficiency, including that the North Bay Channel depths did not allow for the efficient movement of deep draft vessel commerce, and (2) deep-draft vessels that called at Humboldt Bay had vessel design drafts that were constrained by the existing channel depths. The purpose of the Humboldt Bay Channel Deepening Project in 2000 was to address these conditions.

2.2.5 Port-Related Services

Associated with port activities are a number of related commercial services, including tug boat and harbor pilot services, stevedoring, and longshoremen. Tugboat service is provided by several companies, including Knutson Towboat Company, Brusco Tug & Barge, and Mark's Tugboat Company.

The Humboldt Bay Harbor District provides expert pilotage for vessel arrivals, departures, and moves within the harbor. The District requires that all foreign vessels and U.S. flagged vessels navigating Humboldt Bay, not sailing under a coastwise endorsement issued by the U.S. Coast Guard, except vessels under 300 gross tons, are required to use a pilot holding current licenses for Humboldt Bay.

Stevedoring services in Humboldt Bay are provided by Stevedoring Services of America (SSA Marine) and Marine Terminals Corporation (MTC).[6] The International Longshore and Warehouse Union (ILWU) supplies manpower for on- and off-loading assistance. Currently no dockside cranes are in use on Humboldt Bay, and vessels use on-board cranes to load and off-load cargo.

[5] U. S. Army Corps of Engineers Final Feasibility Report and Environmental Impact Statement/Report for Navigation Improvements.

[6] Stevedores contract with a vessel's owner, representative, or agent or with the owner of a vessel's cargo to load or unload the vessel in port, typically serving as a liaison between the vessel and the longshoremen who perform the actual cargo handling.

Table 2-2. Summary of Cargo & Operation by Terminal (Revised 2005).

Terminals	Channel Location	Cargoes & Operations
• Schneider Dock	North Bay/Eureka Channel, south of downtown Eureka	Multi-purpose utility dock; intermittent berthing of non-cargo vessels, including Coast Guard, cruise boat and marine environmental/safety
• Eureka Forest Products (Sierra Pacific)/Preston Properties	North Bay Channel, south of downtown Eureka	Multi-purpose forest products dock; inbound log barges; outbound woodchip barges; occasional inbound lumber barges
• Chevron Terminal	North Bay Channel, south of downtown Eureka	Bulk refined petroleum products; dedicated ocean barge every 7 to 8 days
• Humboldt Bay Forest Products	Fields Landing Channel, Fields Landing	Import logs; approximately 20 to 35 inbound log barges per year
• Simpson Samoa Chip Export Dock	North Bay/Samoa Channel Samoa Peninsula	Bulk woodchip exports
• Fairhaven Terminal	North Bay Channel, North Spit	Fairhaven: containerized and/or break-bulk wood pulp exports from Evergreen Mill

(Source: *Port of Humboldt Bay Harbor Revitalization Plan*, 2003)

Fields Landing Channel, South Bay

2.2.6 Landside Transportation Considerations

The market competitiveness of any port depends to a considerable extent upon efficient connections to inland areas by truck and rail transportation modes. These connections are critical factors in determining the long-term, economic well-being of a port. The Harbor Revitalization Plan addressed Humboldt Bay's "transportation competitiveness" as part of a market opportunity analysis for the harbor. Port-related transportation issues for Humboldt Bay have also been addressed in a number of other studies by the District, County of Humboldt, Humboldt County Association of Governments, City of Eureka, and advisory and trade groups, including the California Marine and Intermodal Transportation System Advisory Council.

Humboldt Bay's transportation competitiveness is limited by a number of economic and geographic conditions that do not constrain other potentially competing ports, including the area's relative remoteness and rugged topography. In terms of rail transport, the Northwestern Pacific Railroad line, which formerly served Humboldt Bay, has been out of service since 1996 after the line washed out at several points in the

Eel River canyon. The line was closed by Federal Railroad Authority in 1998. Since that time the North Coast Railroad Authority (NCRA), the current owner of the line, has pursued state and federal funding and support for restoring service on the line; major right-of-way, track, station and yard, service, and environmental cleanup improvements are needed.[7] The NCRA has made some progress in restoring service on the south end of the 300-mile line; reopening the line north of Willits depends on the availability of state and federal funds, a number of agency and environmental approvals, and stabilization of the line through highly unstable geological materials along the northern route.

Humboldt Bay's competitive range by truck is also limited. The Harbor Revitalization Plan identifies a truck-competitive "hinterland" that includes a relatively small area bounded approximately by Medford and Klamath Falls, Oregon, on the north, Redding on the west, and Willits on the south. Beyond that area, truck shipping rates are generally lower to competing ports.

Truck competitiveness to and from Humboldt Bay is further limited by truck length restrictions that do not apply at competing ports. The trucking industry uses longer trailers of 53 to 56 feet in length to help cut costs and improve efficiency. California currently allows trucks with 53-foot trailers to operate on the National Network and terminal access routes throughout the state. Currently, however, Humboldt County has truck restrictions on all state highways entering the county from the north, east and south, and no portion of Humboldt County (or Trinity County) is served by truck routes meeting federal interstate truck length guidelines. In addition, truck routes in all directions to and from Humboldt Bay currently do not meet California legal truck length requirements, which allow a king-pin-to-rear-axle (KPRA) length on semi-trailers of up to 40 feet. Advisory routes at three locations limit KPRA length in and out of Humboldt Bay to 32 feet or less: on CA 299 to the east at Buckhorn Summit, to the south on U.S. 101 at Richardson Grove, and to the north on U.S. 101 nine miles north of Trinidad (Harbor Revitalization Plan 2003; HCAOG 2004).

[7] See, for further discussion, HCAOG 2004.

North Bay Pacific Oyster long-lines

Improvements to the east side of the Buckhorn grade have been identified by various studies as potentially providing the greatest travel time reduction and benefit to truck transport to and from Humboldt Bay on State Route 299 corridor; however, this project would be expensive and require major environmental reviews. CalTrans has considered approximately $120 million in Buckhorn Summit improvements that would remove the Advisory Route restrictions and allow California legal truck lengths connecting to I-5 at Redding; additional improvements at about six locations along CA 299 would raise the route to Federal interstate STAA standards (Harbor Revitalization Plan 2003; HCAOG 2004).

2.3 Harbor-Related, Non-Cargo Activities

In addition to port-related functions discussed above, other commercial, non-cargo activities also rely on Humboldt Bay. These other uses are described separately from port activities in this subsection mainly as a convenience for discussion; these activities comprise important facets of harbor-related activities with significant contributions to the local economies.

2.3.1 Marinas, Boat Repair Operations, and Associated Small Craft Facilities

Humboldt Bay is served by marinas at Woodley Island, on the City of Eureka waterfront, and at King Salmon. Woodley Island Marina, owned by the District, is the largest marina in Humboldt County. The 237-slip facility is located on the 26-foot deep Inner

Reach of Eureka Channel, and serves a combination of commercial fishing boats and recreational vessels. At the west end of the marina is an approximately 200-foot dock for larger vessels, such as the Humboldt State University marine research vessel and a Coast Guard patrol boat. The Woodley Island Marina facility also provides a work and storage areas, hoist and forklift services, restaurant, ships chandlery, offices, laundry, and restroom facilities. The island has also become home to the region's National Weather Service facility.

The Eureka Public Marina (also known as the "Boat Basin" or "Small Craft Harbor") is a 134-slip facility, owned by the City of Eureka and located near downtown on the 26-foot Outer Reach of Eureka Channel; the Eureka Public Marina serves a combination of local and visiting recreational vessels and commercial fishing boats. King Salmon Marina, Johnny's Marina and RV Park, and E-Z Landing are located just north of Fields Landing on the 26-foot deep Fields Landing Channel; these privately owned and operated facilities are used by recreational vehicles, seasonal commercial fishing boats, and pleasure craft.

Humboldt Bay is served by one small boat/ship repair facility. The Fields Landing Boat Yard is a self-serve facility provided by the District at Fields Landing Terminal. The District provides the haul-out and launch service and the individual vessel owners arrange for repair work at the site; the facility includes a 150-ton capacity travel lift. The Eureka Boat Yard was a small, privately owned facility located on Samoa Peninsula south of Samoa Pacific Chip Export that formerly also provided repair work on a seasonal basis.

Two areas in Humboldt Bay provide locations for small-parcel marine commercial and industrial uses, as identified in the Harbor Revitalization Plan. In this capacity, they serve as "incubator" sites for small industry to develop. The approximately 8-acre "Fields Landing Small-Parcel Site," located on the Fields Landing Channel between Humboldt Bay Forest Products and Fields landing Terminal, encompasses seven parcels, formerly home to Vita Sea Corporation and Eureka Fisheries. These parcels are now owned by Humboldt Bay Forest Products. The "Samoa Peninsula Small-Parcel Site" is located on Samoa Peninsula between the Simpson Samoa Chip Export Dock and the Simpson/Fairhaven Terminal Property. The approximately 9-acre site encompasses almost 40 parcels, including residential, boat repair, mariculture, and other uses.

2.3.2 Commercial Fishing

Commercial fishing, and a number of occupations and facilities related to commercial fishing, has long been an important part of the tradition, culture, lifestyle, and economy of the Humboldt Bay area. In the 1950s, there were approximately 500 commercial boats in the Bay, and fish canneries in Old Town Eureka, King Salmon and Fields Landing were highly productive; in 1953, the Tom Lazio Fish Company processed 1.1 million pounds of crab (Times Standard 2004). In more recent times, commercial fisheries have been impacted by habitat loss and degradation and by over-fishing; the industry has also been adversely affected by restrictions of fishing areas and seasons. Fishery-related landings in Humboldt Bay have declined from 20 million pounds in 1990 to under 8 million pounds in 2001 (Harbor Revitalization Plan; District information).

Currently, approximately 220 registered commercial vessels list Eureka as home port and over 500 vessels from other West Coast ports use the bay's facilities annually (HCAOG 2004; District information). Commercial fishing facilities are concentrated at Woodley Island Marina, along the Eureka waterfront from the Eureka Public Marina to the foot of J Street, and at Fields Landing. The fishing fleet is based at Woodley Island Marina, the City Marina, and, to a lesser extent, at King Salmon Marina in South Bay.

The two types of fishing boats generally used in Humboldt Bay are trollers and trawlers.[8] Trollers, typically under 50 (often 30) feet in length, deploy multiple individual lines to catch salmon; larger trollers may fish for albacore tuna in deeper ocean waters. In season, trollers often set crab pots to catch Dungeness

[8] There is, in addition, a limited herring gillnet fishery within Humboldt Bay, with six permit-holders but only one operator who regularly fishes for herring.

Eureka waterfront tug Ranger*, circa 1910*

crab. An estimated salmon fleet of 75 commercial boats remain active; this number is supplemented during salmon season by large numbers of recreational boats that generally fill the marinas. Trawlers generally range from 45 to 80 feet in length and carry large net spools on their sterns. These boats pull nets along the seafloor at depths of 250 to 3,500 feet to catch various types of groundfish. Many trawlers have been bought out with federal funding to reduce fishing impacts on the groundfish fishery.

According to the Harbor Revitalization Plan, a "strong core group of approximately 200 commercial fisher people (sic) based in Humboldt Bay continue to make their living from the harvesting of fish for human consumption and research." In addition to the Humboldt Bay-based fleet, the Bay provides a safe haven for the Pacific-based albacore tuna fleet when weather conditions force them to harbor. The albacore tuna fleet makes use of the Bay on an annual basis; these boats generally tie up at the Eureka Public Marina and Woodley Island Marina.

Pacific Choice Seafoods is the major remaining fish-processing facility in operation on Humboldt Bay; other fish buyers include Carvalho Fisheries, Caito Fisheries, and Humboldt Seafood Unloaders. Some processing facilities have gone out of business or been bought up by the larger companies. Pacific Choice, the Bay's largest processor, is located on the Inner Reach of the Eureka Channel at the City of Eureka owned EDA-funded fish plant. The City-owned facilities, at the foot of Commercial Street in Eureka, include a fish processing plant with area for a second plant, a ship's chandlery, and a fueling facility (HCAOG 2004). Groundfish, tuna, salmon, Pacific pink shrimp, and Dungeness crab are among the most important commercial species.

The Harbor Revitalization Plan also notes the following:

> "Although the Humboldt Bay fishery has declined in recent years, the industry remains an important part of Eureka's economy. Diversification efforts have succeeded in bringing people and other businesses closer to the water, but they have contributed to a sense among the commercial [fishing industry] that it is subject to displacement. The City of Eureka has been actively pursuing a common [fish products] marketing and support center to be built at the

foot of C Street, west of the recently completed boardwalk. …

"The foot of C Street is currently zoned by the City as for waterfront commercial uses. This zoning designation is appropriate for the [proposed fish products] center but does not ensure against encroachment by other permitted uses such as restaurants and water-oriented retail. The current zoning is a concern to fishermen as they have seen tourist-oriented activities force out commercial activities on other waterfronts. This [Harbor Revitalization] study's findings are that completion of the [fish products] center should be a high priority of the City and other supporting agencies, and that serous consideration be given to zoning that will protect [fishing industry] activities against further encroachment."

2.3.3 Mariculture

With good water quality, a healthy estuarine environment, and sheltered tidal substrates, Humboldt Bay provides an excellent environment for shellfish mariculture. The Bay's mariculture industry consists of shellfish farming, primarily oysters but also clams; both seed and adult oysters are produced. Approximately 74,240 gallons of oysters were harvested from Humboldt Bay in 2002. The District exercises primary local jurisdiction over mariculture activities in Humboldt Bay; other agencies that may also be involved in directly or indirectly regulating mariculture include the U. S. Army Corps of Engineers, the California Department of Fish and Game, the California Coastal Commission, the North Coast Regional Water Quality Control Board, the State Lands Commission, the California Department of Health Services, the City of Arcata, and the City of Eureka.

Various methods are used for shellfish farming, as described in more detail in the Harbor Revitalization Plan and other sources.[9] The "Rack and Bag" method uses steel reinforcing bar ("rebar") racks placed into the sandy or muddy substrate, and plastic mesh bags containing oyster stock are attached to the racks. Another method is the Floating Upweller System (or "FLUPSY"), which is a porous mesh raft that holds the seed stock. Oyster "longlines" are another suspension method where oysters are grown along ropes supported above the intertidal substrate. Manila seed clam mariculture generally is conducted using floating, anchored rafts. Ground culture methods, involving harvesting of cultured oysters by hydraulic dredge, were typically used in the past. In the past five years, a variety of off-bottom techniques, particularly longlines, have become the primary method of oyster mariculture used in Humboldt Bay, and hydraulic dredging has been permanently discontinued.

Coast Seafoods Incorporated, the largest mariculture company on Humboldt Bay, uses Humboldt Bay for oyster and clam cultivation, providing fresh and canned shellfish to local and foreign markets. Coast Seafoods holds title to approximately 561 acres of Humboldt Bay tidelands, and it leases another 3,385 acres from the District and the City of Eureka, for a total of approximately 3,946 acres, all in Arcata Bay. The actual amount of area in production at any given time is much less, however; the operational area has varied from 500 or 600 acres in the past to about 300 acres currently. Coast Seafoods currently uses a variety of "off-bottom culture" methods, primarily longlines (Army Corps 2003).

Other mariculture companies operating in Humboldt Bay include North Bay Shellfish, Emerald Pacific Seafoods, Aqua-Rodeo Farms, Humboldt Bay Oyster Company, and Kuiper Mariculture. These companies conduct a variety of activities – including shore-based tanks, rack-and-bag, longlines, FLUPSY, and floating work platforms – in areas of the Bay from the Mad River Slough to Fields Landing. Kuiper Mariculture and North Bay Shellfish, for example, use mariculture rafts in the Mad River Slough Channel area. North Bay Shellfish sells its products locally; Kuiper is a seed supplier for both domestic and international markets. Humboldt Bay Oyster Company produces oyster seed and market oysters – including "single oysters" for the half-shell market and other specialty uses – for

[9] See, for example, Conte, Harbell, and RaLonde 1994 & 1996. Oyster Culture – Fundamentals and Technologies of the West Coast Industries. Western Regional Aquaculture Center Publication Numbers 94-101 and 6-96 Addition.

customers all along the West Coast. Humboldt Bay Oyster Company uses rafts in the Mad River Slough for the nursery stage of production; seed oysters are then moved to the North Bay and grown in mesh bags strapped to rebar racks. Various scientific studies related to mariculture and the environment have been conducted in recent years in cooperation with mariculture companies, including studies related to eelgrass, salmonids, and water-quality issues.

The Harbor Revitalization Plan also notes the following:

"The aquaculture industry in Humboldt Bay is an independent, thriving business community. Its current needs include continued water quality improvement, rapid transport access to markets (throughout the U.S., North America, and Europe) and a dedicated work area for independent shellfish farmers. Such a work area would include a waterfront building with dock access to water; covered areas for harvesting and packaging; tanks for larval settings; and storage for gear and supplies. A 3-4,000 square foot building on a two-acre parcel would be adequate to serve existing independent shellfish farmers with some room for moderate growth.…

"Humboldt Bay shellfish farmers need recognition from their community that their industry is important, and continued consideration of their requirements as other Bay planning efforts move forward."

2.4 Harbor Revitalization

This Harbor portion of the Humboldt Bay Management Plan is based in part upon – and incorporates recommendations from – the Port of Humboldt Bay Harbor Revitalization Plan, a technical study completed for the District, the County of Humboldt, and the City of Eureka in 2003. While keeping the port "vital" is among the ongoing objectives of the District, the vision is updated and renewed periodically by studies such as this Harbor Revitalization Plan. This chapter of the Plan highlights some of the main findings and recommendations of the Revitalization Plan in terms of Humboldt Bay's advantages and limitations, priority market opportunities, and recommendations for utilization of key port sites.

2.4.1 Advantages and Limitations

The Revitalization Plan identified a number of core competitive advantages for the Port of Humboldt Bay, including: large waterfront industrial sites; natural resource availability (forest products, bulk aggregates, rock, fresh water); unique tourism surroundings and attractive downtown waterfront areas; marine science and environmental base (including Humboldt State University's marine science program); and "livability" – the positive qualities of the Humboldt Bay area that could attract new industries.

With respect to the large waterfront sites, the Revitalization Plan specifically noted that "large waterfront industrial sites on deep water … are a rarity and, thus, a significant advantage for Humboldt." The plan identified three particular sites in excess of 200 acres that are all located on the 38-foot shipping channel: the publicly-owned City airport site, the privately-owned Simpson site, and the District-owned Redwood Dock (Simpson-Samoa) site, all located on the Samoa Peninsula.

The key disadvantages at Humboldt Bay identified by the Revitalization Plan were: small local market size, and difficult inland transportation access. The plan noted that the limited size of the population and economic base in Humboldt's natural "hinterland" area are a clear disadvantage in attracting traditional marine cargo business. In addition, the local area is primarily a producing region, generating little inbound freight for consumption. As discussed above, Humboldt Bay area's limited inland rail and truck access is also a significant disadvantage; if rail service is restored, it would aid marine-dependent industrial opportunities where adequacy of rail service is needed to compete.

2.4.2 Priority Market Opportunities

According to the Revitalization Plan, the most promising opportunities for the Port of Humboldt Bay Harbor are in the following areas:

- Marine-dependent industrial projects,
- Niche dry and liquid bulk cargoes,
- Tourism and marine science,
- Aquaculture and commercial fishing,

- Boat building and vessel repair, and
- Forest products.

Marine-dependent industrial opportunities are essentially manufacturing facilities requiring a major marine shipping component, either to bring in raw materials or to ship out finished products. Humboldt's advantages are the availability of large sites on Samoa Peninsula with access to the 38-foot channel, relatively low cost land, labor, and livability. Dry bulk cargo opportunities include the shipment of bulk aggregates and rock to the Northern California construction market. Liquid bulk cargo opportunities were identified in liquefied natural gas (LNG) and export water.

For marine-dependent uses in general, the District supports port-related functions for Humboldt Bay, according to its legislative mandate; in this support, the District must also take into account its obligations with respect to conservation and recreation. The Revitalization Plan provides a perspective indicating that some forms of liquid bulk and solid bulk commodities may be economically desirable in the future operations of the Port of Humboldt Bay; however, land-use approval authority for coastal-dependent areas and uses around the Bay rests primarily with other agencies. With respect to LNG development, a preliminary proposal in 2004 to develop an LNG terminal met with considerable public opposition, and the proposal was withdrawn. In implementing the Humboldt Bay Management Plan, the District will continue to balance the variety of (sometimes competing) uses of the Bay's waters, as it is mandated to do.

Aquaculture (mariculture) was seen to be a growth industry with relatively low investment requirements; the excellent shellfish farming conditions in Humboldt Bay suggest that the region has a good opportunity to build on its competitiveness in this area (the relatively higher transportation costs notwithstanding). Possible tourist and marine science activities – such as a public aquarium, cruise dock, Naval vessel museum, and marine science center – were also found to be potential opportunities, particularly if approached as a "synergistic cluster." The study found some merit in the opportunity of attracting a boat builder to Humboldt Bay.

Existing import and export forest product terminal handling activities should continue to be supported and monitored for potential new opportunities; the potential for a coastal forest products barge service or rail-on-barge service warrant monitoring and further investigation; and the needs of commercial fishing should continue to be supported.

According to the Revitalization Plan, Humboldt's basic weaknesses – in the areas of local market size, lack of proximity to a large metropolitan market, and limited inland truck and rail access – are major competitive disadvantages for cargo handling activities, including containers, automobiles, break-bulk steel, fruit, and project cargoes. The study found that these markets should be given the lowest priority.

2.4.3 Recommended Strategy and Utilization

The Revitalization Plan considered two future scenarios, first with restored rail service, and under current conditions without rail service. The plan recommended involving public investment in bulk and marine-dependent industrial dock facilities: "These strategies target the harbor activities most justified by the market in terms of their overall attractiveness and the Port of Humboldt Bay's competitiveness."

According to the Revitalization Plan:

"[B]y pursuing public investment in bulk and marine-dependent industrial dock facilities, the Harbor District can play a vital role in attracting and securing new harbor opportunities with an appropriate level of risk. Because these types of facility developments tend to be deal driven and long-term in nature, direct participation in their development by the Harbor District, City of Eureka or County of Humboldt, or the application of port-issued, tax-exempt industrial development bonds, could provide a valuable service while assuming a reasonable business risk.

"The scenarios that include a public general cargo terminal are not recommended because they are not supported by the market analysis and they

Levee breach

Chip barge—Humboldt Bay Forest Products
(Photo by John Powell)

Eland *departs with* Nehalem *dredge*

involve an unreasonably high level of risk. Almost all of the markets that would be involved in public general cargo terminal operations were identified as unattractive in the prioritization analysis, and Humboldt Bay was found to be uncompetitive in most of them as well. The 'build it and they will come' nature of public general cargo terminals, combined with the short contract terms common in the trade, high customer leverage, and intense port competition, would result in excess capacity and a level of risk that is not commensurate with the limited market opportunity available.

"The scenarios that involve no public investment in marine facilities are also not recommended. Based on the potential bulk cargo and marine-dependent industrial opportunities that could be available, and their deal-driven nature, a 'no public investment' strategy is likely to be too passive and provide too little public stimulus to result in success.

"As to the rail conditions, a strategy of supporting restoration of the NCRA rail line but preparing for the continuation of no rail service is recommended. The availability of rail service will no doubt enhance the marine-dependent development strategy and the two should be coupled when promoting the Port's needs with state and Federal agencies and representatives. However, there is no certainty that rail service will be funded and restored in the foreseeable future. Therefore, the District should continue to periodically explore the feasibility of coastal barge feeder services as an alternative to rail."

Finally, the Revitalization Plan identified certain marine uses for a number of key or priority sites for each market segment. These recommendations are summarized in Table 2-3.

Table 2-3. Summary of Recommended Sites for the Priority Markets (Modified 2005).

Marine Use	Recommended Sites
• Marine-Dependent Industrial Opportunities	Eureka Airport Property Redwood Dock
• Bulk Aggregates/Rock	Fields Landing Terminal (southern origin) Pulp Mill Dock (northern origin)
• Liquid Bulks	Evergreen Pulp Mill Dock Fairhaven Terminal
• Marine Science/Tourism	Dock B/Balloon Track Property
• Aquaculture Facility	Fields Landing Small-Parcel Site (current needs) Parcel 4 (long term growth)
• Boat Building & Vessel Repair	Fields Landing Terminal (public site) Schneider Property (private site)
• Commercial Fishing Work Area	Commercial Street/C Street Dock
• Coastal Lumber Barge Service	Eureka Forest Products/Sierra Pacific (open storage) Fairhaven Terminal (covered storage)
• Rail-on-Barge Service	Fields Landing Terminal Humboldt Bay Forest Products Schneider Dock
• Forest Products Cargo Handling	Eureka Forest Products/Sierra Pacific (chips, logs lumber) Fairhaven Terminal (pulp, plywood, veneer) Humboldt Bay Forest Products (logs, lumber) Simpson Chip Export dock (chips)

Silva *towing a two masted schooner in Arcata Bay—circa 1890*

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Chapter 3.0

Recreation Setting

3.1 Introduction and Overview

This chapter of the Management Plan provides a summary of the general state of recreation in and around the Bay, with an emphasis on characterizing representative areas, activities, facilities, programs, and management responsibilities within the waters and lands of the District's primary jurisdictional area. Recreation within the District's broader sphere of interest is also considered to a secondary extent, particularly through references to management and planning activities of neighboring jurisdictions, agencies, and other involved entities.

Outdoor recreation occurs when people enjoy a leisure activity in a particular setting. Without a suitable place for the activity to occur and a means of access to that place, the particular form of outdoor recreation cannot exist. Accordingly, this characterization of the recreational uses around Humboldt Bay pays particular attention to places and facilities where recreational activities can occur, how recreational users may gain access to public waters and lands, and the public agencies that may be responsible for providing those areas and access points.

This chapter is intended to provide a general baseline setting within which the District management policy framework (Section III) can be applied; it is not intended to be a comprehensive encyclopedia of all Humboldt Bay recreational resources. In the discussions that follow, the recreational setting for District recreation management activities is characterized broadly, beginning with general considerations for management such as state-wide trends, local economic benefits of recreation, related education and interpretation activities, visual quality, and universal access. These general considerations are followed by a discussion of the "supply and demand" of major recreational areas, facilities, and public access points in and around the Bay. In this context, the providers of these recreation areas and facilities are also described, including the role of the District; these agencies are also discussed in Section I, the introduction to the plan. This chapter also characterizes the general recreational setting in terms of representative types of water-dependent and near-shoreline activities; major recreational areas, facilities, and access points; and the three sub-areas of Humboldt Bay.

South Bay near Table Bluff

Humboldt Bay Owl's Clover

Cows and geese graze the Arcata Bottom

3.2 General Recreation Management Considerations

"Recreation" in general encompasses a wide range of physical or human revitalization activities undertaken for personal enjoyment, satisfaction, or health through the voluntary use of leisure time. Recreation may be undertaken individually or in groups; it may be planned or spontaneous, "passive" or "active," "traditional" or "non-traditional," and "consumptive" or "non-consumptive." It may or may not require special skills, training, and equipment; it may or may not require a designated area or special facilities.

For the purposes of this Management Plan, "recreation" is understood to include a wide range of existing and potential outdoor activities and opportunities in and around Humboldt Bay. While these various recreational activities make up the overall recreational use setting, the plan focuses on aspects of Humboldt Bay recreation that the District may be actually able to develop, enhance, or otherwise manage, either singly or in conjunction with other public agencies. Of particular importance to this plan are water-related and near-shoreline forms of recreation in and around Humboldt Bay.

3.2.1 Recent General Trends in Outdoor Recreation

Public preferences and broad trends in outdoor recreation are tracked by a number of State and federal agencies, as well as by professional associations and related non-profit organizations interested in outdoor recreation. In broad terms, state-wide trends and preferences can be expected to be relevant for recreation planning purposes in and around Humboldt Bay. For example, a major influence and challenge to recreation planning in California is the robust pace of growth in the state – not just in cities or metropolitan areas, but essentially in all regions. California is growing rapidly, and its population densities are increasing. People are also moving to historically less crowded, less expensive areas and away from high-density, high-cost areas.

The population is becoming increasingly diverse and multi-cultural so that, currently, there is no ethnic majority in California. Hispanic and Asian/Pacific populations account for much of the growth. In addition, large segments of the population are aging, as more Californians of the mid-20th century generations become senior citizens, yet continue to be active for a longer period of life. As the population changes, another trend is toward income inequality, with the number of people at the lower end of the income scale increasing at a disproportionately higher rate; studies show that people with lower incomes rely heavily on public recreation facilities.

These population, demographic, and cultural changes are likely to be reflected to some extent in terms of recreational demand around the Humboldt Bay area. The natural, human attraction to shorelines and water is unlikely to change, so there will be more people spending leisure time in water-oriented recreation activities. As the population of the Humboldt Bay region increases in future years, the overall recreational demand is also likely to increase, and this demand will likely reflect the regional demography; the types of recreation available may need to evolve, including the provision of more opportunities for those in lower-income and older-age brackets.

3.2.2 Recreation and Local Economies

A variety of benefits from recreational areas accrue to local economies from recreation-related activities. Recreation areas and outdoor activities can be substantial employment generators by creating jobs and entrepreneurial businesses; such resources generally attract and help to retain visitors in a local area, thus having secondary economic effects. Recreational opportunities are among the attractions that increase tourism, one of the largest and one of the fastest growing industries in the world today. Recreation areas, parks, and tourist-serving waterfronts may attract new businesses to the community.

Active outdoor recreation activities tend to improve health and work performance, leading to increased productivity, decreased absenteeism, decreased staff turnover, and reduced on-the-job accidents. Relatively small investments in recreation areas, facilities, parks,

and programs can yield relatively large economic returns, as the money generated by events, capital development, and provision of services is spent several times in the community. Recreational areas, parks, and open spaces also increase property value and, therefore, tax revenue on adjacent land; many developers tout access to water, parks, and recreation areas as marketing features.

3.2.3 Public Education and Interpretation

Education and interpretation can play a number of important roles in recreational experiences. The presence of a museum, marine laboratory, and even information displayed on kiosks and in interpretive guides can do much to enhance visitors' understanding of natural and cultural resources and values. Through education, people become more aware of their natural and built environment, which can encourage them to share in its protection and improvement. Extensive use is made of the Humboldt Bay area for educational and scientific purposes by various academic and non-profit groups, who, in turn, may play various roles in public education and interpretation efforts.

3.2.4 Visual Quality and Aesthetic Concerns

Under its authorizing mandate,[1] the District has a general responsibility to take actions that help to control and enhance the aesthetic appearance of areas within its jurisdiction. This, in turn, has related benefits to recreational experiences. People enjoy outdoor experiences in places with unobstructed scenic views; aesthetic considerations also extend to the quality of Bay waters and lands. The Coastal Act requires agencies to consider the scenic and visual qualities of coastal areas in decision making, to protect visual quality as a resource of public importance, and, where feasible, to restore and enhance visual quality in visually degraded areas:

"The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas."

In the Humboldt Bay area, various visual quality considerations, including designated vista points, have been documented in plans and studies over the years. Views of the Bay are important from adjoining cities and coastal communities; views of the shorelines, as seen from the water and lands (e.g., Woodley Island) are also important aspects of the visual environment.

3.2.5 Equitable, Inclusionary, & Universal Recreational Opportunities

Public agencies have responsibilities to serve all constituencies, regardless of race, ethnic background, income level, and physical or mental disabilities. Among the various requirements promoting equitable treatment of people in public settings, including in terms of providing recreational opportunities, are the Americans with Disabilities Act of 1990 (ADA) and the concept of environmental justice.[2]

The ADA changed the way in which public and private agencies provide recreation opportunities. Agencies must provide design and access options to the extent possible, so that persons with and without disabilities may participate in the most integrated setting. Reasonable accommodations must be made for people with disabilities; ideally, every recreation opportunity that is offered to people without disabilities should also available to recreational users who have a disability.

The concept of environmental justice (EJ) has become an increasing part of the vocabulary of state and federal planning over the past decade. In general, the term refers to the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development and implementation of environmental laws, regulations, and policies. Federal agencies, for example, are required to incorporate environmental

[1] Appendix 2 of the California Harbors and Navigation Code (Chapter 1283 of the Statutes of 1970), as amended, which created the Humboldt Bay Harbor, Recreation and Conservation District.

[2] See, in particular, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations (1994).

justice into their missions by identifying and addressing the disproportionately high or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Along similar lines, the California Coastal Act (which preceded the EJ concept) also states that lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided in the Coastal Zone. In some areas of the country, environmental justice considerations may apply to those who fish or harvest shellfish for sustenance. Environmental justice considerations apply not only to "recreational" aspects of the District's management, but also to "conservation" and "harbor" functions.

These considerations are being increasingly incorporated into recreation planning and facility design around the Humboldt Bay area; however, few facilities are fully accessible in terms of offering access to the Bay and an equal range of opportunities. Meeting the needs of wheelchair users may also benefit other constituencies, including the elderly, children, families with strollers, and, where appropriate, other wheeled forms of locomotion.

3.3 Major Recreation Providers

Providers of public outdoor recreation land and water areas, access locations, and facilities are part of the "supply side" of the recreation resource management. Recreation providers include federal, state, and local government agencies; non-profit organizations; and various services and facilities within the private sector. Collectively, these various entities deliver "leisure services" either directly by providing lands, facilities, and services, or indirectly through programs, funding, technical assistance, partnerships, and other functions.

In the Humboldt Bay area, outdoor recreation activities occur on public lands and waters that are administered by agencies of the United States, State of California, County of Humboldt, City of Eureka, City of Arcata, or the District itself. Outdoor recreation activities in the Humboldt Bay area also occur on privately owned lands; the private sector plays an important and substantial role in providing recreational opportunities and services through privately owned properties and facilities, including marinas; boating and equipment rentals; tours, promotion, and marketing; and various concessions, vendor activities, and other services.

In the management of recreational lands and facilities, recreation providers are faced with a variety of needs, responsibilities, and concerns. Public agencies operate under legal requirements and responsibilities, and resource managers must provide programs and facilities that are consistent with their respective agency's mission. Among the many related concerns of recreation managers are concerns for public safety and health, access for people with disabilities, and equitable use by low-income and minority groups. Land management agencies that administer areas used for recreation typically are balancing multiple uses with which recreation may at times be in conflict. Private providers of recreation opportunities are somewhat less constrained by public agency administrative and mission-related mandates; however, they also must consider public safety issues, potential liability, compliance with laws and regulations, and other management and operational factors.

3.3.1 The District's Role

Acting on behalf of the public interest with respect to enhancing public outdoor recreational opportunities associated with Humboldt Bay is one of the three main functional areas for which the Humboldt Bay Harbor, Recreation and Conservation District was created and for which it remains responsible. This recreation management function is conducted by the District in the context of its other responsibilities to promote and manage the development of the Port of Humboldt Bay and other harbor functions, as well as to protect, conserve, and enhance the natural resources of the Bay.

Outdoor recreation in the Humboldt Bay area tends to be "resource-dependent," and the largest and most significant resource feature is the Bay itself. The District, as the public agency with primary responsibility for uses and resources on and immediately around

Humboldt Bay, has a prominent role in directly or indirectly developing, enhancing, and managing Bay-related recreational opportunities.

As described in more detail in Section I, the District's primary jurisdictional area is the land and overlying water in the Bay generally up to the elevation of mean higher high water. The District's jurisdiction also extends to certain creeks and sloughs that are tributaries to the Bay. Beyond that area of primary jurisdiction, there is a secondary "sphere of interest" that generally coincides with the Coastal Zone, over which the District might have some indirect involvement in some cases, but for which the District lacks formal jurisdiction. Beyond that secondary area, the District has a general interest in, but no direct authority over, activities within the Humboldt Bay watershed as a whole – a larger region that encompasses the primary jurisdiction and secondary sphere of interest areas.

The District conducts its own planning, funding applications, and development of improvements with respect to various types of recreational uses and improvements, including boating and other facilities, signage, and various services throughout the District's jurisdiction. In addition, the District also works in cooperation with a variety of agencies, organizations, and private individuals to enhance recreational opportunities in and around Humboldt Bay. Woodley Island Marina is a prime example of the District's commitment to cooperative recreational development, where a number of public and private entities share and contribute to the overall collection of facilities and services that benefit the public. The District also supports the efforts of other local agencies to develop water-oriented recreational facilities, such as the improvements to the Fields Landing Boat Ramp by Humboldt County and the improvement of facilities along Humboldt Bay's Eureka Channel as part of the City of Eureka's Waterfront Revitalization Plan. District support to other agencies may take a variety of forms, including participation in grant applications and funding, in-kind support, and procedural and technical assistance.

The District's original statute and its subsequent management policies and ordinances place few restrictions on the concept of "recreational use." According to this enabling legislation, creation of the District was consistent with a State policy "to develop the harbors and ports of this state for multiple purpose use for the benefit of the people." Recreation uses in the original statute are clearly intended to be "public," the access to these uses must be "open." In other words, all waters and lands within the District's jurisdiction are public, and thus potentially open to public recreation uses; however, the District's responsibilities also include management activities related to harbor and conservation, and recreational uses "share" the Bay with many other non-recreational uses. Some of these other uses – such as those dedicated to environmental restoration and to maintaining visual quality – tend to enhance public recreational experiences; other uses of the Bay – such as those related to water-dependent industrial and commercial uses – may not always enhance public recreational experiences and may even present compatibility or safety issues. In general, the District strives to take a balanced approach to management of the various uses of the Bay.

The District's authority, powers, and responsibilities as a public-serving governmental agency have implications for management of recreational resources. The District has a general responsibility to ensure public safety and welfare, and to act in the public interest. It possesses a number of the usual powers of a local government, including the ability to incur bonded indebtedness, the authority to abate public nuisances, and the authority to exercise its powers of eminent domain. Under its authorizing statute, the District's main purposes include promotion of recreation upon the inland navigable waters of the Bay, and "establishment of open space areas and areas provided for recreational use with open access for the public." The authorizing statute (pre-California Coastal Act) also gave the District a broad authority for construction and operation on public tidelands of public buildings, boating and other recreational facilities, associated commercial uses, and appurtenant roads, utilities, and infrastructure.

As a special district, the District serves as a coordinating entity for harbor, recreation, and conservation matters among the various governments with jurisdiction around Humboldt Bay, particularly including actions that would likely not be accomplished solely by other public agencies or private interests. This is consistent with the requirement of the District's authorizing statute "to work closely with the planning agencies of the adjacent corporate bodies" in the exercise of its powers and duties.

Recreation uses are implicitly related to the protection and enhancement of natural resources, the aesthetic appearance of Humboldt Bay and its surrounding areas, and the improvement of the harbor for boating and other forms of public enjoyment. In conjunction with the connection to aesthetic appearance, public access is also understood to include visual access – e.g., the public benefits inherent in views of open water, shoreline, and compatible harbor development. The District has a general duty to control and enhance the aesthetic appearance of the areas within its jurisdiction.

3.3.2 Federal Management Agencies

Federal agencies play a significant role in providing recreation lands and opportunities around Humboldt Bay through their functions as public land managers, as participating or cooperating agencies, in cooperative projects, in technical matters, and as otherwise involved through jurisdiction by law or special expertise.

Federal agencies also provide funding support to local agencies. The involvement of federal agencies adds a federal "layer" to the administration of public recreational lands and uses through federal legal requirements, such as the requirements of the National Environmental Policy Act (NEPA) and the National Historic Preservation Act; requirements associated with wetlands, floodplains, endangered species and air and water quality; and other laws and regulations.

The **Bureau of Land Management** (**BLM**) administers substantial public land areas, including the Samoa Dunes Recreation Area on the North Spit, and, in conjunction with other agencies, the South Spit Cooperative Management Area, as discussed further in subsequent subsections.

The **U.S. Fish and Wildlife Service** (**USFWS**) manages the Humboldt Bay National Wildlife Refuge (NWR) Complex, which consists of several non-contiguous units adjacent to Humboldt Bay and its tributaries, as well as one unit offshore (Castle Rock NWR). From north to south, the Humboldt Bay NWR units are: Lanphere Dunes, Ma-le'l Dunes, Jacoby Creek, Eureka Slough, Indian Island, South Bay, White Slough, Salmon Creek, Hookton Slough, and Table Bluff. The refuge offices and visitor center are located the Salmon Creek Unit, adjacent to the South Bay. The Humboldt Bay NWR protects and enhances wetland and Bay habitats for migratory waterbirds, including Pacific brant. The Lanphere and Ma-le'l units, northwest of the North Bay, provide habitat for sensitive dune and estuarine communities and endangered species. The Hookton Slough Unit includes a public Bay-access facility for small, non-motorized watercraft.

3.3.3 State Management Agencies

State agencies are important contributors to recreation around Humboldt Bay in terms of their functions in managing or participating in the management of public areas; they are also important in terms of regulatory oversight and in providing funding for existing and potential recreation-related land acquisition, improvements, and enhancements. State agencies also provide funding and technical support to local agencies. The following are among the State agencies involved with recreation in some form around Humboldt Bay.

The **Department of Fish and Game** (**DFG**) is responsible for managing four wildlife areas on or in close proximity to Humboldt Bay: Mad River Wildlife Area, Fay Slough Wildlife Area, Eureka Slough Wildlife Area, and Elk River Wildlife Area. These wildlife areas are managed by the Department for the benefit of fish and wildlife and their habitats; these public lands also provide recreational and open space functions. The Department oversees and regulates waterfowl hunting on Humboldt Bay; related to this regulatory function,

the Department conducts periodic census counts of wildfowl populations on the Bay and elsewhere.

The **Wildlife Conservation Board** (**WCB**) is an independent board that administers funding to carry out acquisition and development programs for wildlife conservation and related public recreation. The primary responsibilities of the WCB are related to land acquisition, habitat restoration, and development of wildlife-oriented public access facilities; the WCB selects projects and allocate funds under several programs. Through the WCB, financial assistance is made available to local agencies and districts for development projects and facilities construction; facilities may include fishing piers, jetty access walkways, nature trails, and interpretation facilities. Projects are usually completed in coordination with local agencies, which then operate and maintain the improvements for public use.

In the Humboldt Bay area, examples of WCB projects have included participation in the C Street Dock and Del Norte Street Pier Fishing Access project in Eureka, in cooperation with the City of Eureka and the State Coastal Conservancy. The WCB also provided funding to the City of Arcata to assist in the public acquisition of land for the Arcata Marsh Expansion just west of the City, as well as in the Jacoby Creek-Gannon Slough area, south of the City; the latter was a cooperative project with the California Coastal Conservancy and Department of Fish and Game.

The **California Department of Parks and Recreation** (**DPR**) is among the several Resources Agency departments that directly provide recreational areas and opportunities; others provide regulatory oversight, financial assistance, and resource protection functions. The Department of Parks and Recreation is a cooperating agency with the BLM in the management of the Samoa Dunes Recreation Area, particularly for the management and funding of off-highway vehicle (OHV) activities through its Off-Highway Motor Vehicle Recreation Division.

The **Department of Boating and Waterways** (**DBAW**) helps to develop public access improvements to facilitate public access to California waterways; DBAW also provides loans and grants for funding boating and waterway-related improvements, such as marinas, vessel sewage pumpout stations, aquatic pest control, beach erosion projects, and boat launches. DBAW also promotes on-the-water safety; programs include officer training and boating safety education.

In 2004, the DBAW facilitated State funding assistance for a new Boating Instruction and Safety Center adjacent to the Adorni Center in Eureka; the facility will be managed by Humboldt State University. DBAW, in conjunction with the Wildlife Conservation Board, also previously facilitated State funding to the County for improvements at the Fields Landing Boat Launch Area, including the boat boarding float and improvements to enable boat launching at lower tides, Additionally, the DBAW has funded public boat launch facilities under the Samoa Bridge and at the Eureka Public Marina. DBAW funds have also been used to fund portions of the construction of the Woodley Island Marina and Eureka Public Marina.

The **California Coastal Commission** administers policies of the California Coastal Act including policies aimed at protecting and expanding public access to the shoreline and recreational opportunities and resources, including commercial visitor-serving facilities. Other policies are aimed at protecting scenic quality. In conjunction with the California Coastal Conservancy and several non-profit and advocacy groups, the Commission also supports the completion of the California Coastal Trail, a designated National Millennium Legacy Trail. In the Humboldt Bay area, alternative trail alignments have been identified, but only short segments of the Coastal Trail have so far been developed.

The **California State Coastal Conservancy** (**SCC**) is an independent state agency that uses non-regulatory means to acquire, protect, restore, and enhance coastal resources, wetlands, and public access to the shore. The Conservancy's main program areas involve coastal public access, resource enhancement, coastal agricultural preservation, site reservation,

urban waterfronts, and non-profit assistance. The Conservancy works in partnership with local agencies, non-profit organizations, and private property owners to resolve coastal land use controversies and develop management plans and restoration programs. It is also the designated agency charged with development of the California Coastal Trail.

Over the years, the Conservancy has assisted with a number of projects around Humboldt Bay including Manila Dunes Access, Arcata Marsh, Bracut Marsh, PALCO Marsh, the Eureka Waterfront, C Street Fishing Access (a cooperative project with the City of Eureka and the Wildlife Conservation Board), the Manila Dunes, Ma-le'l Dunes, the former Humboldt Buggy Club property, and a portion of the support for this Management Plan planning effort.

The **California Conservation Corps** provides young people with paid, on-the-job training in public service and educational activities that assist them in becoming more responsible citizens, while protecting and enhancing California's environment, human resources, and communities. The Corps works on reimbursable projects such as trail building, erosion control, irrigation systems, and tree-planting. There is a Conservation Corps office in Fortuna, CA.

3.3.4 Local Agencies

City of Arcata. The City of Arcata is an incorporated city in the northeast corner of Arcata Bay (Arcata is also the location of Humboldt State University, a separate State entity acting under its own planning framework). The City has an estimated (2003) population of 16,900; the City's General Plan includes an assumption of low population growth, to about 20,000 persons, by the year 2020. A substantial portion of the land area within the City that borders on Humboldt Bay is City-owned, including the City's wastewater treatment facilities, the Arcata Marsh and Wildlife Sanctuary, and other tidelands and restored or enhanced wetlands. The Arcata Marsh and Wildlife Sanctuary occupies more than 300 acres, with approximately 225 acres open to the public; an interpretive center is located on South G Street. (Other City habitat restoration or enhancement areas are discussed in the Conservation chapter.)

In the City of Arcata General Plan 2020, which incorporates the City's coastal planning requirements, the Bay is valued as a designated public trust resource and an open space area that: protects natural habitats, provides public coastal access and recreational uses, reserves tidal areas for aquaculture, and preserves scenic views. Among the guiding principles in the plan are the protection and management of public trust lands to sustain plant and animal species and ecosystem health and the preservation of sufficient lands for active and passive recreational activities and coastal access to serve the present and future needs of the community.

According to the City's General Plan, the Arcata (North) Bay and tidelands represent an important natural edge and open space feature of the City; buildings, landform alterations, and access routes in this area are required to be of a design and scale that preserve open space and natural characteristics and maintains public views to the Bay. It is City policy to review proposals that could affect resources within the City's planning area in terms of the proposal's compatibility with applicable General Plan policies; under this policy, the City reviews proposals of the District for issues pertaining to management of Humboldt Bay tidelands that have been granted to the City (see Section I). It is a guiding principle of the plan to protect and manage public trust lands to sustain plant and animal species and ecosystem health.

The City's recreation policies include designating public access corridors, as well as establishing a system of foot trails and interpretive sites along the Arcata Bay shore, westward to the City limits. City policies also restrict motorized vehicles to paved roads and parking lots, and encourage valid scientific and educational studies of wetlands and tidelands. Policy RC-4c, "Coastal-dependent and public trust uses of Arcata's tidelands," identifies a number of provisions for managing tidelands. Among these provisions are: the maintenance and improvement of the Arcata Marsh and Wildlife Sanctuary, maintenance and enhancement of

the South I Street boat launch, placement of interpretive signs along the Arcata Bay shore, and public use of the levee for passive recreation and nature observation.

The City of Arcata's General Plan states that it is a coastal access policy that the City shall maintain coastal access corridors to Arcata (North) Bay and other public use areas and public trust lands within the coastal zone. Designated coastal access routes in the City of Arcata include:

- Access from Samoa Boulevard to Arcata Bay via South I and South G Streets.
- Access to Mad River Beach via Mad River Road.
- Access to Manila Dunes via Samoa Boulevard.

City of Eureka. The City of Eureka, is the largest incorporated city in Humboldt County and the County seat; it has an estimated population (2004) of 26,250. The City is located on the Middle Bay, and it is a significant influence on the Bay in many ways, including waterfront uses, urban design, viewsheds, visitor-serving facilities, transportation systems, and other urban activities. The Eureka waterfront is approximately 7 miles long; areas within the City that border on the Bay include both private and City-owned property.

The City of Eureka General Plan includes a Recreational Resources policy stating that the City will work with other park and recreation service providers to ensure the availability of a park and recreational system that includes sufficient diversity of areas and facilities to effectively serve the varied characteristics, densities, needs, and interests of Eureka residents and visitors.

The General Plan also includes a number of policies directed toward establishing a "continuous public access system" throughout the City's Coastal Zone area, including improvement of public open space and shoreline access along the waterfront and First Street. The City's General Plan identifies, and generally prescribes improvements for, the following coastal access locations:

- Along shoreline between J and M Streets;
- At the foot of C Street;
- At the Small Boat Basin;
- At the foot of V Street;
- At Eureka Slough, north of the Northwestern Pacific Railroad tracks;
- On an expanded west-side shoulder of State Highway 255 on Indian Island;
- At Woodley Island at the westerly end of the marina;
- From the Samoa Bridge to and along Eureka Slough;
- Along the Eureka northern waterfront between Commercial Street on the west and the Samoa Bridge on the east;
- Near Second and Y Streets in the East Bridge District;
- At the foot of Truesdale Street;
- Along waterfront between Truesdale Street and Hilfiker Lane;
- Halvorsen Village and East Park Plaza;
- Near K Street across the Northwestern Pacific Railroad right-of-way from Waterfront Drive to Old Town;
- Across the Northwestern Pacific Railroad right-of-way along the city's bayfront;
- Greenways or gulches near Eureka, First, and Second Sloughs;
- Elk River; and
- Elk River Spit.

The Eureka General Plan states that the City shall enforce access standards and recommendations contained in the State Coastal Conservancy/Coastal Commission's "Report on Coastal Access" as the criteria for improvement, maintenance, and management of accessways and supporting facilities proposed in the General Plan.

The City of Eureka General Plan also supports the maintenance and, where feasible, the provision, restoration, or enhancement of facilities serving commercial and recreational boating, including party or chartered fishing boats. An additional policy states that the City shall participate in the development of a

facility for the Humboldt Bay Rowers Association on the waterfront.

In 2004, the City, Humboldt State University, and the State Department of Boating and Waterways broke ground on a new Boating Instruction and Safety Center adjacent to the existing Adorni center on the City's waterfront across from Woodley Island Marina. The City, in partnership with other agencies and non-profit organizations, is working on creating a Bay trail along its entire waterfront.

County of Humboldt. Humboldt County, with an estimated population of 128,300 (2003), encompasses approximately 2.6 million acres, approximately 80 percent of which is forest, parks, and recreation areas. Most people (just over half of the total population) live in the Humboldt Bay region. The County's land use responsibility encompasses the unincorporated lands in the Humboldt Bay watershed, including portions of the coastal areas around the Bay not within the two incorporated cities, such as the Samoa Peninsula communities of Manila and Samoa. The County is currently in the process of updating its General Plan, which will address both coastal and non-coastal areas.

In the Humboldt Bay area, Humboldt County is a recreation provider in terms of maintaining several County-owned recreation and Bay-access locations, such as the Samoa Boat Launch, the County's boat ramp at Fields Landing, and Table Bluff County Park. The County also regulates numerous other coastal access points, which have been inventoried in past coastal planning efforts. The General Plan update will include an updated inventory of coastal access points.

3.3.5 Non-Government Organizations

Non-profit and other non-government organizations (NGOs) play important roles in working with public agencies and other recreation providers. Because they typically can move more quickly than government agencies, non-profit organizations can act as a holding entity and bridge for land acquisitions that can subsequently be transferred to public agencies for management. NGOs play a vital role in volunteer activities and stewardship; they can be advocates for certain public access and recreation improvements[3], raise funds, provide public education, lead guided tours of sensitive environmental areas, and provide educational information to the public, media, and elected officials. Funds raised by members and contributors to non-profit organizations can help to improve and expand public recreational areas, facilities, and opportunities.

Non-government organizations, however, may not implement projects that may result in significant environmental or land use effects without obtaining the required approvals from relevant governmental agencies, including local land-use agencies such as the District, cities and the County, as well as state and federal agencies like the California Coastal Commission or the U.S. Army Corps of Engineers.

3.3.6 Private Sector Entities

Recreation locations and services provided by businesses and individuals in the private sector are also an important and valuable part of the recreational setting on and around Humboldt Bay; these private sector enterprises provide associated benefits to local economies. Private recreation providers offer recreational activities on privately owned lands with privately owned facilities, or they may work in concert with public agency land managers.

On Humboldt Bay, private recreation-related stores and services, marinas, boat rentals, and other enterprises are of substantial importance to the total collection of recreational experiences; they facilitate or enhance the overall recreation experience of many local and out-of-area users. On public lands and facilities, concessionaires are good examples of how the private sector can work with public agencies to provide important adjunct services to the public. Private sector business may have advantages in raising capital, as might be needed for a new venture, or in responding to a new and popular recreation market. Public-private partnerships can use the strengths of both sectors for mutually beneficial goals.

[3] See for example, Redwood Community Action Agency (RCAA), 2001. Humboldt Bay Trails Feasibility Study. Report prepared for the California Coastal Conservancy.

3.4 Major Public Recreational Activities

This subsection provides a general discussion of the major public recreational activities in and around Humboldt Bay, under the categories of water-dependent activities and other "near-shoreline" recreational activities. The purpose of this subsection is to provide a representative sample of the types of recreational activities conducted on or around the Bay. Detailed, comprehensive recreational use data and user-derived information concerning recreational demand and preferences in and around Humboldt Bay are very limited. Generally, recreation activities in the Humboldt Bay area include, but are not limited to: boating, kayak and canoe paddling, sailing, surfing and wind-surfing, waterfowl hunting, sport fishing, clamming, crabbing, walking, hiking, bicycling, camping, picnicking, sight-seeing, plant-viewing, birdwatching, photography, beachcombing, off-highway vehicle use, nature study and appreciation, and just being outdoors, on the Bay, and away from work.

3.4.1 Water-Dependent Recreational Activities

Water-dependent recreational activities in and around Humboldt Bay include sport fishing, waterfowl hunting, clam digging, crabbing, sailing, small craft boating, surfing, wind-surfing, and skindiving. Sport fishing access to Humboldt Bay is typically by boat or skiff launched from any of a number of boat launch facilities on the Bay, as described further below. Sport fishing is also conducted from shore and dock areas, and by skindiving. The City of Eureka Del Norte Street Pier and the North Spit jetty are a couple of the popular fishing venues.

Hunting for waterfowl is conducted on the Bay, sloughs, marshes, and adjacent agricultural and other uplands. Designated waterfowl hunting areas include the Eel River Wildlife Area, the Humboldt Bay National Wildlife Refuge, Mad River Slough Wildlife Area, and the Fay Slough Wildlife Area. Waterfowl species hunted include the American widgeon, scaup, scoter, pintail, redhead, mallard, teal, bufflehead, and Pacific brant. The South Bay is among the most important brant-hunting areas in California. Hunting is generally conducted using boats, sculling in a low-profile skiff, walking along levees, and using temporary or permanent blinds along the shoreline.

Sport charter boats are available from Woodley Island, in the Eureka Boat Basin, and King Salmon areas; tour boats dock at the foot of C Street, Eureka. Sailboats and other small craft use the various boat ramps and launches available around the Bay (described further below). The waves directly west of the North Jetty and locations on the ocean-side beaches are used for surfing. Clam-digging access is generally by foot along the South Spit and in the South Bay, by boat launched from a ramp or shore, or by skiff. Sport crab pots and rings are used in the waters of the Bay, typically attached to docks and pilings. Skin-diving, primarily for sport fishing, occurs close to the rocks on the inside of the South Jetty and occasionally on the inside of the North Jetty, during calm weather and slack tide.

3.4.2 Near-Shoreline Recreational Activities

In addition to water-dependent recreational activities, there are many other activities that occur in near-shoreline environments where the activities may benefit from, but are not necessarily dependent upon, direct association with water. These near-shoreline activities include walking and hiking, beachcombing, guided and unguided nature walks, picnicking and general day use, camping, sightseeing by car, birding, bicycling, jogging, off-highway vehicle (OHV) use, and horseback riding. OHV use is allowed within the BLM's Samoa Dunes Recreation Area on the North Spit and on the waveslope area in the South Spit Cooperative Management Area. Horseback riding occurs on the Mad River beach, North Spit, South Spit, and Elk River Spit.

3.5 Major Public Recreation Areas, Facilities, and Access

This subsection provides a general summary of representative recreational uses and opportunities throughout the Bay watershed. Following a Bay-wide

overview and a discussion of the District properties, further characterizations are presented by the three geographical sub-areas of the Bay (see Section I): the Arcata (or North) Bay, the Entrance (or Middle) Bay, and the South Bay.

A sailboarder takes advantage of the wind

From a broad overview perspective of the Bay as a whole, certain areas stand out as among the highlights of recreational use areas on and around Humboldt Bay. Although up-to-date and comprehensive recreational visitor-use data are limited throughout the Humboldt Bay area, the following areas, shown on Figure 3-1, are considered to be among the major recreation destinations in the Bay area in terms of overall size, range of visitor activities, and apparently higher levels of use:

- Woodley Island Marina and Wildlife Area
- City of Arcata Marsh and Wildlife Sanctuary
- Humboldt Bay National Wildlife Refuge
- Samoa Dunes Recreation Area on the North Spit
- South Spit Cooperative Management Area
- City of Eureka waterfront, including the boardwalk, marina, wharfs and piers
- the King Salmon area (beach, marinas, and fishing access)
- the Fields Landing area (boat launch, boat repair yard, and dock)

In addition to the facilities shown in Figure 3-1, numerous points of access to the coast have been developed or designated within the Humboldt Bay region (Figure 3-2).

3.5.1 District Properties

The several properties owned and managed by the District are described in Section I of this plan. These properties and facilities are used for a variety of purposes, consistent with the District's multiple functions in managing Bay resources and activities; some uses or potential uses contribute to the recreational "inventory" in and around Humboldt Bay.

3.5.2 Recreation Resources and Opportunities by Sub-Areas

The following subsections provide a characterization of each of the three sub-areas of the Bay, as described in Section I, particularly with respect to recreational opportunities and facilities.

North Bay. North (or Arcata) Bay covers approximately 13 square miles and is approximately 5.8 miles at its longest and 4.3 miles at its widest points. North Bay is generally very shallow, with over half of the area exposed at low tides. These tidal flats are incised by several deeper channels, as well as numerous shallow channels. There are no maintained (dredged) deep-water channels in the North Bay north of the Samoa Bridge.

North Bay (Arcata Bay) is generally bounded by the Samoa Peninsula and the North Spit to the west; the Arcata Marsh and Wildlife Sanctuary, Arcata Bottoms, and City of Arcata to the north; Bayside Bottoms and the Bracut areas to the east; and the City of Eureka and Woodley Island to the south.

The City of Arcata, at the head of the Bay, is the dominant urban influence in the North Bay area.

Figure 3-1. Existing coastal recreation sites near Humboldt Bay, showing visitor improvements (Friends of the Dunes)

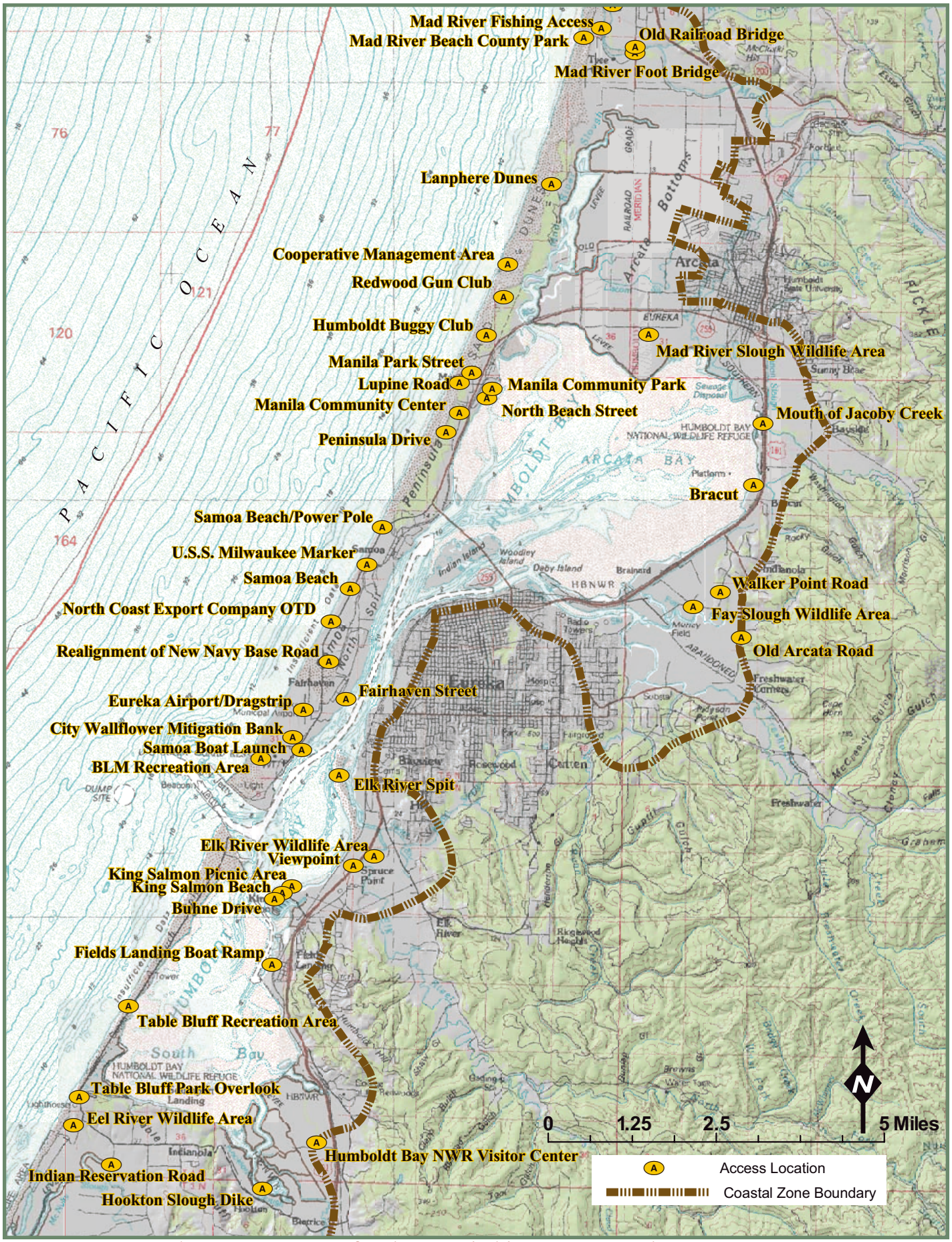

Figure 3-2. Coastal access inventory for the Humboldt Bay region, showing a selection of developed access points. (Source: County of Humboldt)

Other residential areas around North Bay include the unincorporated community of Manila on the Samoa Peninsula; the Manila Community Services District provides recreation and access improvements in that area. Shore and tidal margins vary considerably from the riprap-reinforced margins of the public access areas at the Arcata Marsh and Wildlife Sanctuary, to the sandy beach east of Manila, to unconsolidated tidal mudflats in the many locations in the tidelands.

Recreation activities in and around North Bay include boating, paddling (e.g., kayaks and canoes), fishing, clamming, birdwatching and nature enjoyment, walking and hiking, beach play (Manila), and enjoyment of scenic views. Hunting (regulated by the Department of Fish and Game) is allowed at several locations, including the State managed area at Fay Slough Wildlife Area. Portions of the USFWS Jacoby Creek and Eureka Slough units are open during the State waterfowl hunting season; these locations are designated for boat access only.[4] Boating in North Bay is somewhat limited because of the shallow water and tidal conditions; popular areas include the Mad River Slough area, with ("unofficial") access from the Highway 255 bridge and other locations. Mad River Slough, a tidal extension of North Bay west of Arcata, does not normally discharge fresh water into the Bay; during flood conditions on the Mad River, however, flood waters may overflow into the slough and thus into Humboldt Bay.

Entrance Bay. Entrance (or Middle) Bay is the narrowest yet busiest part of Humboldt Bay. Entrance Bay is approximately 5 miles long and generally less than a mile wide. It is bounded by the North Spit on the west, Arcata Bay to the north, the City of Eureka and Elk River spit and wetlands to the east. It includes Woodley Island and Indian Island (south of the bridge) and the City of Eureka waterfront.

The City of Eureka is the dominant urban influence in the Middle, of Entrance, Bay. The waters of Entrance Bay include dredged channels that support commercial port-related activities; the main North Bay Channel extends northerly from the harbor entrance and branches west of Eureka into the Eureka Channel and the Samoa Channel. Entrance Bay lacks the expansive mudflats found in Arcata Bay and South Bay; significant portions of the shoreline in this part of the Bay have been armored to prevent erosion. Elk River, the largest single source of fresh water in the Bay, empties into Entrance Bay.

Centers of recreational activity in and around Entrance Bay include the Woodley Island Marina; the City of Eureka waterfront, the Eureka Public Marina, and fishing access points on the east side of the Bay; and the BLM Recreation Area and the County's Samoa Boat Launch on the North Spit. Recreational opportunities in and around Entrance Bay are relatively plentiful and include recreational boating, small craft paddling, fishing, clamming, sailing, off-road vehicle use (North Spit), walking and hiking on trails, and enjoyment of scenic views.

South Bay. South Bay covers approximately 7 square miles and is approximately 4 miles at its longest and 2.5 miles at its widest points. It is bounded by the South Spit on the west side, Entrance Bay on the north, lands and waters of the Humboldt Bay National Wildlife Refuge Complex on the southeast, and the elevated Table Bluff anticline to the southwest. Like Arcata Bay, much of the South Bay is occupied by broad expanses of tidal flats; the tidal flats of the South Bay are incised by numerous small, shallow channels and one deep-water channel, the Fields Landing (or Hookton) Channel, which serves the Fields Landing and King Salmon areas, is maintained for navigation. Hookton Slough is a tidal extension on the southeastern side of the South Bay. Shoreline margins are for the most part unimproved.

Developed areas on the South Bay include the unincorporated communities of King Salmon and Fields Landing. Centers of activity in and around the South Bay include:

- boating and marina activity in private marinas in the Fields Landing and King Salmon areas
- the County's boat ramp at Fields Landing

[4] See 50 CFR Part 32, Subparts A and B (including Section 32.24 California).

- the County's Table Bluff County Park
- the visitors center at the USFWS Humboldt Bay National Wildlife Refuge
- the USFWS small, non-motorized boat launch facility on Hookton Slough
- the South Spit Cooperative Management Area

Recreational opportunities in and around the South Bay include recreational boating, waterfowl hunting, birdwatching, wildlife observation and photography, nature study, beachcombing, small craft paddling, fishing, clamming, sailing, limited off-highway vehicle use (primarily on the waveslope in the South Spit Cooperative Management Area), and enjoyment of scenic views.

3.5.3 Public Access Points

A broad policy goal of the California Coastal Act of 1976 is to maximize coastal access for all people while protecting public rights, private property, and sensitive coastal resources. The Coastal Act requires, among other things, that development not interfere with the public right of access to the sea (Section 30211). Coastal Act requirements are mirrored in the local coastal plans prepared by local agencies in the Humboldt Bay area. In addition, a number of coastal access inventories have been developed in the region over the years by State and local agencies and non-profit organizations.

For the purposes of this management plan, virtually all the public lands and facilities bordering on the Bay are considered as potentially suitable public access points, subject to determinations by the responsible local agency or agencies. In general, access points must be considered in context of adjacent shoreline uses (including private property concerns), natural environment and potential effects, public safety, existing and lateral access, existing parking, land use, local roadway access, public and alternative transit, and trail connections. Representative access points are included in Table 3-1.

3.5.4 Trails

Trails for non-motorized use – on foot, wheelchair, bicycle, boat, or horseback – are enjoyed in all types of outdoor recreation settings, and they are important components of recreational use in the Humboldt Bay area. Trails provide access to the Bay, the coast, and other recreational uses; they are enjoyed by a wide variety of people of all ages, abilities, and physical conditions.

Land-Based Trails. While some trails and potential trail locations do occur within the District's area of primary jurisdiction, most trails, even those that follow the Bay shore, are most often located on lands where the District does not have direct authority. Designating, creating, and maintaining locations for non-motorized public use is the proper function of public agencies that administer land use on upland areas adjacent to the Bay. The City of Eureka's ongoing efforts to create a Bay trail along the City's entire waterfront is a good example of trail development and management by a local public agency. Another example is the City of Eureka's recently established Elk River Wildlife Trail.

As appropriately characterized in an area-widestudy of trails by a local non-profit organization,[5] the "backbone" of a future regional trail system through the Humboldt Bay area is the California Coastal Trail. While conceived several decades ago, the California Coastal Trail still remains to be completed in many areas, including around Humboldt Bay. Many local agencies and non-profit groups are working with the Coastal Conservancy toward the goal of eventually completing a continuous trail from Oregon to Mexico.

Water Trails. Water trails are routes for recreational watercraft, including canoes, kayaks, and similar non-motorized, small craft. For such recreational paddlers, Humboldt Bay presents both challenges and opportunities. A water trail program, with designated routes and associated water trail access points, would need to be a cooperative effort of a number of agencies; however, the District would have direct responsibility for participating in such a program and ensuring the compatibility of this use with other uses on the Bay.

[5] Redwood Community Action Agency (RCAA), 2001. Humboldt Bay Trails Feasibility Study. Report prepared for the California Coastal Conservancy.

Facility or Access Point	Responsible Entity	Type of Site or Facility
North (Arcata) Bay		
Lanphere Dunes Unit	USFWS	Natural area, public access *
Ma-le'l Dunes Cooperative Management Area	USFWS, BLM	Natural area, public access *
Arcata Marsh and Wildlife Sanctuary; Arcata Boat Ramp	City of Arcata	Natural area, public access, boat launch
Mad River Slough Wildlife Area	DFG	Natural area, public access, waterfowl hunting
Mad River Slough Bridge, Samoa Boulevard / State Rt. 255	State right-of-way; railroad	Public access **
Mouth of Jacoby Creek	USFWS	Natural area, public access *
Manila Community Park, Beach and Dunes	Manila CSD	Public access, beach
Bracut Wetland Restoration Site	State Coastal Conservancy	Natural area, public access *
Fay Slough Wildlife Area	DFG	Natural area, public access, waterfowl hunting
Jacoby Creek, Gannon Slough	City of Arcata	Natural area, public access *
Middle (Entrance) Bay		
Woodley Island Marina	HBHRCD	Marina
End of Park Street, Fairhaven	County of Humboldt public road	Public access, unimproved boat launch
Samoa Boat Launch (North Spit)	County of Humboldt	Public access, Boat launch, camping
Samoa Dunes Recreation Area	BLM	Multi-purpose site, including OHV use, fishing, natural areas
Samoa Bridge Boat Launch	City of Eureka	Boat Launch
Adorni Center	City of Eureka	Public center, dock, views
Eureka Public Marina	City of Eureka	Marina
Del Norte Street Pier	City of Eureka	Public access, fishing pier
PALCO Marsh	City of Eureka	Public access
Elk River City Wildlife Sanctuary	City of Eureka	Natural area, public access
South Bay		
King Salmon beach	HBHRCD, County of Humboldt, private	Beach, public access
Johnny's Marina	private	Marina
EZ Marina	private	Marina
South Bay marina	private	Marina
Fields Landing Boat Ramp	County of Humboldt	Boat launch
Humboldt Bay National Wildlife Refuge	USFWS	Natural area, waterfowl hunting, visitor center
Hookton Slough non-motorized boat launch facility	USFWS	Public access, boat launch, waterfowl hunting
Fields Landing Boat Yard, Kramer dock	HBRCD	Boat repair
South Spit Cooperative Management Area	DFG, BLM	Public access, multi-purpose site

Table 3-1. Representative Recreation Sites and Major Access Points on Humboldt Bay and Tributaries.

* Public access is restricted.
** Informal or "unofficial" public access site

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Chapter 4.0

Conservation Setting

4.1 Introduction and General Setting

The Humboldt Bay Management Plan is focused upon the portions and aspects of Humboldt Bay that are the concerns of the Humboldt Bay Harbor, Recreation and Conservation District (see Section I). As in the other chapters in Section II, this chapter provides background information that will assist decision-makers and the public in evaluating the policy focus in Section III.

As summarized in Chapter 1.0, several existing summaries of Humboldt Bay's physical and biological setting have been prepared within the period that includes the District's existence (Monroe 1973, Shapiro and Associates 1980, Proctor and others 1980, Barnhart and others 1992). While specific circumstances have changed in many of the setting elements, these general descriptions generally still reflect the conditions present in Humboldt Bay (for some subjects, these general descriptions constitute virtually the known information about Humboldt Bay). For most elements of the Bay's ecosystem these existing characterizations reflect the ecosystem elements adequately for this planning evaluation. For a few elements of the Humboldt Bay ecosystem, more recently recognized information affects the setting of this Plan, and this chapter summarizes the relevant changes from the prior setting descriptions.

As summarized briefly in Chapter 1.0, overly detailed descriptions draw attention from the policies that are the overall focus of the Humboldt Bay Management Plan. This chapter is not an attempt to duplicate the level of effort that went into preparing prior characterizations of Humboldt Bay, for a variety of reasons. Foremost, a detailed characterization would misleadingly suggest that prior descriptions of the Humboldt Bay ecosystem were somehow inadequate or failed to capture the essence of the ecosystem, and that decision-makers in the past made decisions based on inadequate or inappropriate knowledge of Humboldt Bay; such a conclusion would not be consistent with the District's understanding of the Bay ecosystem and past decision-making. There remains substantial uncertainty about the ecological dynamics in Humboldt Bay, even though the general patterns in the Bay are expected to resemble those in other estuaries.

Black Brant

Nucella and algae

Native tree planting on Woodley Island

Notwithstanding the District's reliance on existing characterizations of Humboldt Bay's conservation setting, as synopsized in this chapter, enhanced understanding about the Bay (factual information and organizational models) resulting from recent, ongoing, or future research may affect some elements of the setting and may lead to policy adjustments in the future. That is, certain contexts exist in which the accumulation of additional knowledge through time may lead to a perception that the relevant policies in Section III of the Plan, or in implementation programs adopted in order to carry out the Plan, may need adjustment, and the Humboldt Bay Management Plan will "adapt" to and apply the additional knowledge. The following may be among the subject areas for which future Plan considerations and adjustments might be appropriate, based upon the results of future studies and additional integration of the resulting knowledge:

- The role of Humboldt Bay in contributing to sustainable populations of fish and other species groups in the Bay and the nearshore Pacific
- The importance of certain habitats in the Bay (particularly eelgrass meadows) in providing habitat for wildlife, particularly for fish and invertebrate species
- The effects of exotic species on the Bay's ecology and the need for actions by the District and other agencies in regulating the introduction of exotic species or controlling exotic species that are already present
- The consequences of indirect or cumulative changes in aquatic habitats in the Humboldt Bay basin, and potential actions that the District could take in cooperation with other local, state, and federal agencies

Scientific knowledge (and more importantly, the theories that inform the fact-based knowledge) constantly changes, and it is inevitable that there will be more detailed knowledge about the Bay in the future than exists now. Decision-makers require a framework that allows them to dynamically update scientific knowledge about the Bay in a way that is relevant for their decisions; that is the focus of the Humboldt Bay Management Plan.

4.1.1 Summary of General Physical and Ecological Setting

The subject for this Management Plan is predominantly the tidelands of Humboldt Bay, which is a large marine embayment located on the Pacific Ocean coastline northeast of Cape Mendocino; all of these elements are important in understanding Humboldt Bay and some of the Bay's management concerns (see, especially, subsection 4.2, below). Humboldt Bay has been generally characterized as the largest estuary on the Pacific coast between San Francisco Bay and Coos Bay, Oregon.

Humboldt Bay has been characterized as being "three bays" (see Figure 1-3 in Section I). As a whole, Humboldt Bay is approximately 14 miles (22.7 km) long, with a width between about 0.5 mile (0.8 km) in Entrance Bay and about 4.3 miles (6.9 km) across the widest part of Arcata Bay. The water surface area at low tide is about 7000 acres (2750 ha), or about 10.9 square miles (28 square km); the water surface area at high tide, when all of the tidelands subject to District jurisdiction are flooded, is about 15,600 acres (6140 ha), or about 24.4 square miles (62.4 square km).[1]

The Bay, under current conditions, essentially represents two shallow, broad tidal flat expanses at the ends of a deeper but smaller embayment, with the tidal flat expanses being of different sizes. The tidal flats are drained by tidal channels, which are shallow at their upper ends but deepen substantially as they enter the inner embayment. Tidewater enters and leaves the Bay through a narrow inlet located at the southern end of the smaller embayment, yielding variations in flood and ebb patterns that cause the two shallow arms to differ from one another in some ways.

The Bay occurs in a small coastal watershed, which is only about 223 square miles (570.9 square km) in area. A small number of significant streams enter the Bay, including (from north to south) Jacoby Creek,

[1] The physical data describing Humboldt Bay included in this Plan are generally agreed upon as approximations; specific descriptive data describing Humboldt Bay differ among the existing background studies for the Bay. For the purposes of this Plan, the differences in specific data values do not represent significant variations in the physical characteristics of Humboldt Bay.

Freshwater/Ryan Creek, Elk River, and Salmon Creek; a number of smaller streams also enter the Bay. On the whole, the freshwater inflow to the Bay is hydrologically dominated by the tidal exchange with the Pacific Ocean, and the Bay has been generally characterized as a "marine embayment" for much of the year (see subsection 4.3 below). However, there is sufficient freshwater inflow and terrestrial ecosystem inputs to the Bay's aquatic environment, even during the summer, that ecological conditions within Humboldt Bay differ from conditions in the adjacent Pacific Ocean.

The biota associated with Humboldt Bay is diverse and ecologically significant at scales ranging from a local focus on fisheries and algal uses by local residents to a participation in hemispheric ecological patterns such as shorebird and waterfowl migration. The Bay hosts at least 300 invertebrate species and 100 fish species (as documented in Barnhart and others 1992); recent studies indicate the importance of the Bay in the life cycles of commercially and recreationally important fish species, and the general level of biological vitality in the Bay has been identified as an important aesthetic and quality-of-life variable for both residents and visitors to the area.

As noted below Humboldt Bay, as it exists at the present time, has been partly isolated from what were formerly parts of its tidal prism. As noted in Monroe (1973), as much as 11,000 acres (approximately 4330 ha) of lands that were formerly part of the Bay's tidal prism have been separated from the Bay by levees; an unknown, but relatively small, percentage of these converted tideland acres have been filled and lost from the aquatic ecosystem in the Bay. While the majority of these "reclaimed" lands are no longer fully tidal, they remain wetlands or related aquatic habitats, and still provide many wetland functions within the Bay ecosystem. The majority of these areas are in agricultural uses, predominantly grazing, although substantial acreages are owned by federal, state, or local governments and are managed extensively for public purposes that include agriculture among other purposes. These "diked former tidelands" provide substantial habitat value for wildlife, as well as providing a number of other wetland functions within the broader Humboldt Bay context (see subsection 4.4 below).

The diked former tidelands largely have retained a semblance of their pre-reclamation drainage patterns, and during the rainy winter period most of these diked former tidelands are hydrologically reconnected with Humboldt Bay, significantly increasing the volumes of fresh water and organic material that reach the Bay from these former tidelands.

While the policy framework for uses of the Baylands for industrial and commercial purposes is found in other sections of this Plan (particularly Chapter 2.0 in Sections II and III), the wetland, shoreline, and bottom modifications that have accompanied development have been part of the wetland conversion noted previously. The complex issue of maintaining these culturally modified areas and their existing ecological values, or of restoration of these areas to tidal influence, is much debated in the Humboldt Bay region. This issue presents important baywide management questions, including an identification of the environmental values that exist in these areas currently, the nature and extent of environmental values that could be realized in these areas following a restoration of tidal influence, and the degree to which the extent of tidelands changes in the entire watershed may influence the potential restoration trajectory at potential restoration sites.

Outside of the formerly tidally influenced areas, the Humboldt Bay watershed includes uplands that are largely forested, as well as areas that have been converted to urbanized land uses. The majority of the uplands in the basin are allocated to commercial or incidental forestry uses, which are associated with a general preservation of hydrological patterns associated with wildlands; however, forestry uses also are generally associated with periodic land surface modifications that are accompanied by increased sediment production. The urbanized areas are associated with hydrological modifications that significantly alter hydrological patterns, and runoff from urban areas is often associated with significant degradation of water quality.

Humboldt Bay's management necessitates awareness by the District of the physical and biological values and conditions present in Humboldt Bay. This Plan chapter summarizes some of the known physical and biological relationships affecting the Bay. It is important to note, however, that this Plan cannot encapsulate all possible knowledge about these conditions and relationships. Accordingly, the purposes of the Plan are served best when the District acknowledges a joint responsibility with the public and with other agencies to consider these ecological values in the District's decision-making process. That process will follow on and emerge from the content of this Plan, and in that broader context readers should acknowledge that complete knowledge about the physical and biological conditions in Humboldt Bay will remain elusive.

4.1.2 General Consideration of Ecological Conditions Present in Humboldt Bay at the Time of European Settlement

An understandable tendency exists to consider the conditions that may have existed in California (and other areas) prior to the arrival of European-American settlers as a kind of idealized model, particularly with respect to the potential restoration of historically changed sites to more ecologically desired conditions. Unfortunately, there is relatively little clearly established fact about ecological conditions in Humboldt Bay prior to the entry of the sailing vessel *Laura Virginia* in 1850. It is, nonetheless, possible to draw some inferences that are relevant for the planning considerations foreshadowed by the policies in Section III of this Plan, particularly policies with respect to restoration programs in the Bay.

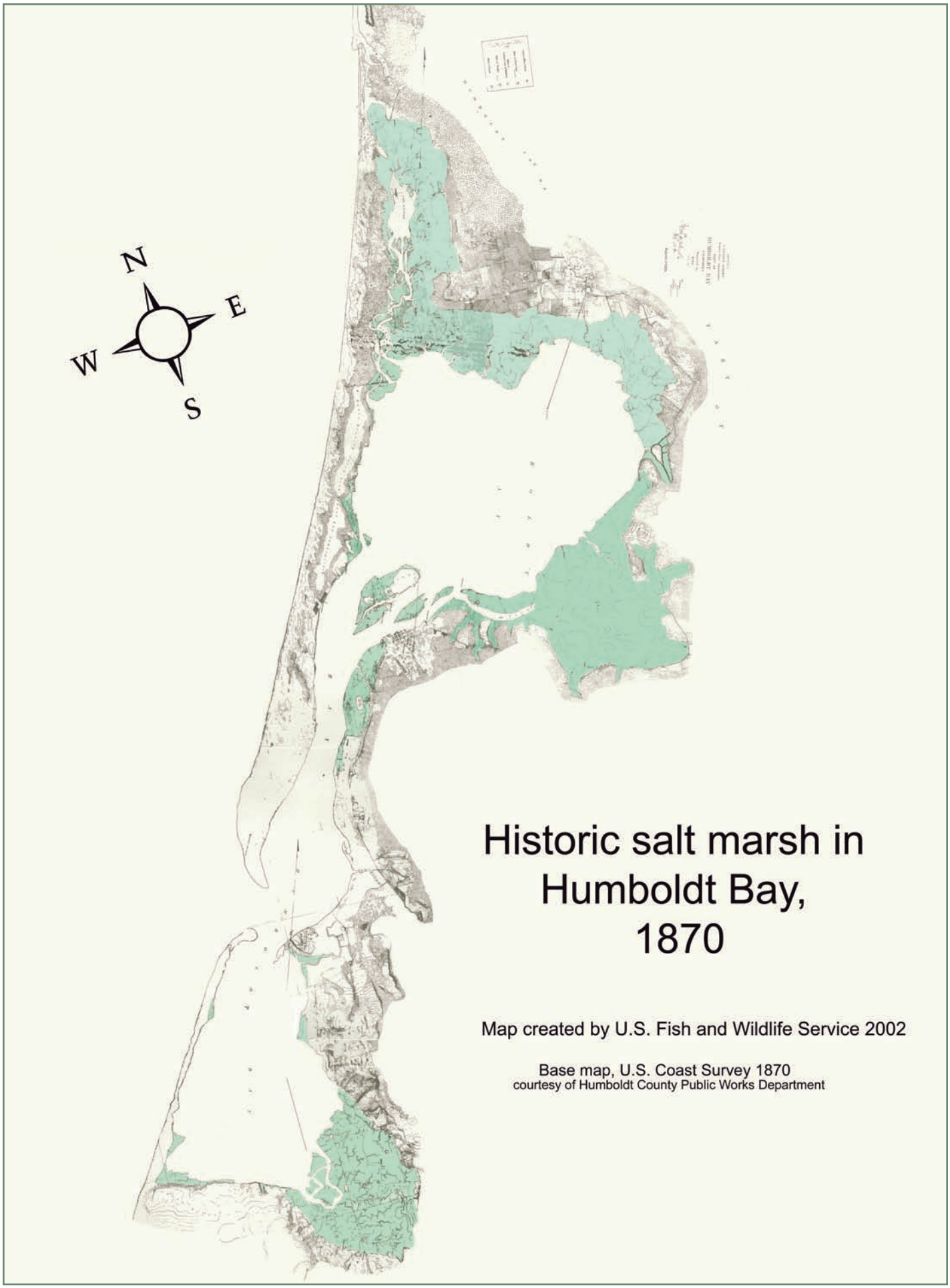
Humboldt Bay in 1850 had extensive intertidal flats and saltmarshes. As noted previously, there may have been as much as 11,000 acres of saltmarshes and shallow tidal channels within the Bay's tidal prism that are no longer part of the area subject to tidal action, mostly in Arcata Bay and South Bay, but also including some saltmarshes along the east side of Entrance Bay in the Elk River valley and between the mouth of the Elk River and the City of Eureka Small Boat Basin.[2] The saltmarshes present at the time of settlement were gradually "enclosed" behind levees built by landowners to support the "reclamation" of saltmarshes for agricultural purposes, a process that was hastened and substantially completed by the construction of railroad tracks around the Bay around the end of the 19th Century.

Well-known biophysical relationships between sediment mobilization and the establishment of saltmarsh vegetation support the conclusion that the pre-1850 marshes were close to flat, as are most of the diked former tidelands today. It appears likely that the essential flatness of the saltmarsh plains around the Bay extended to at least some of the tidal flats that were not vegetated. One of the first developments carried out in the City of Arcata was the construction of a two-mile long wharf, across tidal flats that were exposed at low tide, in order to reach deep water that allowed access by shipping.

The existence of extensive areas of shallow water and fringing saltmarshes in Humboldt Bay at the time of settlement is consistent with the conditions that appear to occur naturally within the coastal lagoons north of Humboldt Bay (e.g., Big Lagoon and Stone Lagoon, but probably not Lake Earl), as well as those having occurred in the westernmost part of the Eel River delta. The occurrence of these extensive shallow intertidal flats and saltmarshes indicate that "pre-settlement" Humboldt Bay differed substantially from the more estuarine conditions in San Francisco Bay. The implications for the Bay's management, particularly for restoration of certain desired ecosystem types, are uncertain.

Humboldt Bay's pre-1850 marshes have been altered significantly; the marshes present today have been altered by exotic species that were not present in 1850. A variety of evidence indicates that the dominant plant species in most of the remaining saltmarshes in the Humboldt Bay basin, dense-flowered cordgrass (*Spartina*

[2] Historical evidence indicates that a part of Humboldt Bay was filled in building the City, including at least the area west of Commercial Street and north of Second Street. It is likely that almost all of the original settlement along the shorelines in the cities of Eureka and Arcata, and perhaps in most other settled areas in the watershed, included wetland filling and the construction of bulkheads or other facilities to allow for human uses of the water's edge.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Historic salt marsh in Humboldt Bay, 1870
Map created by U.S. Fish and Wildlife Service 2002
Base map, U.S. Coast Survey 1870
courtesy of Humboldt County Public Works Department

densiflora), was introduced to the Bay from South America sometime in the late 19th Century. These remaining marshes also are subject to degradation because of the burrowing activities of an exotic isopod species (*Sphaeroma quoyanum*).

Recent research (e.g., Boyd and others 2002) indicates a significant exotic (i.e., non-native) component in the species diversity of Humboldt Bay, ranging across taxa. The potential effects of the exotic species on the ecological dynamics in Humboldt Bay are uncertain. The implications of the presence, and the dominance in saltmarsh and other desired habitat types, of exotic species with respect to Bay management and, to potential restoration, are uncertain.

The pre-settlement Humboldt Bay watershed was densely forested, and the basin's hydrology and runoff water quality are likely to have differed substantially from present conditions. At the time Humboldt Bay's settlement began the watershed including Humboldt Bay apparently was mostly covered by old-growth redwood (*Sequoia sempervirens*) forestlands in upland areas. The "spongy" ground cover and soil in these forests likely attenuated rainfall runoff and prevented significant changes in runoff water quality parameters. Closer to the coastline, and along the margins of "baylands" and in riparian areas, the forests likely were dominated by Sitka spruce (*Picea sitchensis*).

A variety of research sources (e.g., Pitt 1995) have documented the hydrological and water quality effects of the kind of land development generally recognized as "urbanization" on receiving waters, including estuaries such as Humboldt Bay. Hydrologically, runoff patterns associated with developed areas show shifts toward greater storm peaks and shorter delivery periods, usually associated with reduced summertime base flows. The water quality effects of development usually include significant delivery of a large variety of pollutants to the receiving waters, including sediment, various metals, transportation-related hydrocarbons, fertilizers and growth stimulators hormones, biocidal chemicals, and various organic materials that increase demand for oxygen in the receiving waters.

The potential for restoring basin hydrology that resembles pre-development conditions is uncertain, although it may be possible to reverse some of the change. It is also possible to avoid further pollutant releases to Humboldt Bay's receiving waters, and it may be possible to reduce existing pollutant loadings. Effectively managing the hydrology and water quality in the Bay requires adherence to existing laws; the potential for restoring conditions that more closely resemble those in pre-settlement times is uncertain.

4.2 Geophysical Setting

While the Humboldt Bay Management Plan does not explicitly address geological or geotechnical issues, the geological setting of the Humboldt Bay area is germane for several harbor planning issues.

4.2.1 Erosion and Sedimentation

As a harbor-related concern, shoaling in Humboldt Bay is a subject that is appropriately a part of the Management Plan. The District and other agencies expend substantial funds in dredging accumulated sediment from the Bay's maintained channels (see Chapter 2.0). The sources of the sediment in the Bay's channels cannot be specified completely. A portion of the sediment that accumulates in the Bay's channels appears to originate within the Humboldt Bay watershed; the Shapiro and Associates (1980) report cites an estimate of about 90,000 cubic meters of sediment delivered to the Bay's tidal flats and channels annually from the watershed. The majority of the sediment in the Bay appears to be derived from the near-shore Pacific Ocean, however; the Shapiro report identified an estimate of approximately 600,000 cubic meters delivered to the Bay annually from this source.[3]

The sediment delivered to Humboldt Bay would significantly reduce the capability of the Bay to support shipping absent a dredging program to maintain navigation channel configurations, carried out primarily by the U. S. Army Corps of Engineers. Were the Bay's channels not maintained, the accumulated sediment

[3] The sediment delivered to Humboldt Bay from the Pacific Ocean originates within the watersheds of other basins near the Bay, primarily the Mad River basin and the Eel River basin; the dominant source appears to be the Eel River basin.

would gradually reduce the tidal prism in Humboldt Bay, which would decrease the tidal exchange through the Bay's inlet, promoting shoaling there and reducing the Bay's ability to maintain an open entrance. The potential ultimate effect of this trend could be a tidal prism reduced enough that the Bay's entrance could be occluded by accumulated sediment; this eventuality has been realized in many coastal river mouths along the Northern California Coast, including the Eel River. Maintenance dredging helps to maintain the tidal exchange that helps to keep the entrance open. As noted in Chapter 2.0, the dredged material is removed from designated channels and basins, and is ferried to the Humboldt Open Ocean Disposal Site (HOODS) for disposal.

Within the Bay the sediments occur in locations that are determined, in part, by the interplay between sediment size and water currents. Larger sediment particles, such as sand and small pebbles, are generally found in the Bay in the largest channels. Smaller channels have less capability to move sediments than large channels, and smaller channels are normally floored with smaller sand grains and some silty materials. The tidal flats in Arcata Bay and South Bay are composed primarily of silts, and the sediments under saltmarshes are fine silts and clays.

The sediments in the Bay exist within a dynamic equilibrium involving wind, waves, currents, and stabilizing vegetation; the sediments are not, in any sense, permanently fixed in place. Large waves and strong currents frequently develop that are able to move even relatively coarse sediments. Sediment in the tidal flats in Humboldt Bay can be significantly "re-mobilized" by waves that are generated by strong winds blowing across tidewaters in these shallow areas having a long wind "fetch;" the sediment is then redistributed according to the hydrodynamics occurring in the tidal flats and marshes as the tide recedes or the wind decreases.

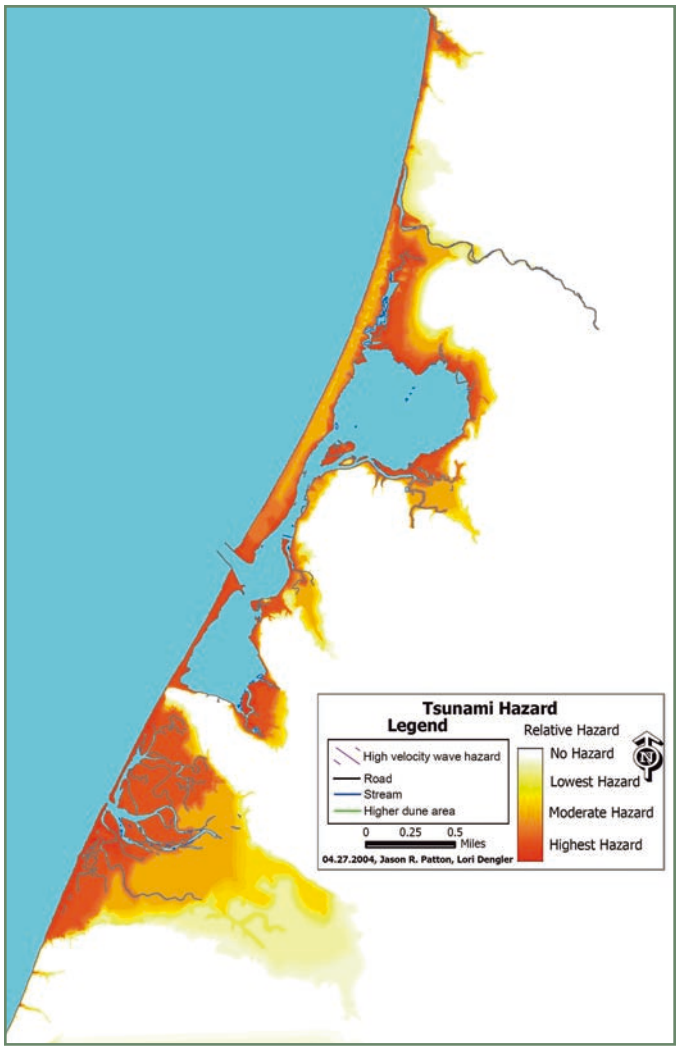
The District lacks direct authority over upland land uses that could increase sediment generation or transport to the Bay. While practices associated with land uses that increase sediment mobilization in the Bay's watershed are indirectly a concern for the Management Plan, the Plan does not include a policy focus for such uses. The District has observed that the County, the City of Eureka, and the City of Arcata all have policies in their adopted land use plans requiring sediment-control measures, and Section III incorporates District policies directing the District to collaborate with these entities (and with the Regional Water Quality Control Board) to address sediment generation and mobilization effects in the watershed.

4.2.2 Regional Geology, Seismic Events, and Tsunamis

The Humboldt Bay region occupies the western margin of the North American tectonic plate, which is moving westward, in opposition to the eastward-moving Gorda tectonic plate. The boundary between the plates is the geological fault known as the Cascadia Subduction Zone (CSZ), which is capable of producing significant earthquakes and significant tsunamis. South of Cape Mendocino the North American plate abuts the northward-moving Pacific tectonic plate. This plate boundary is the fault known as the San Andreas Fault, which also is capable of producing significant earthquakes. The boundary between the Pacific plate and the Gorda plate is a second transform fault called the Mendocino Fault, which also is capable of significant earthquakes.[4] The region in which the three tectonic plates meet is known as the Mendocino Triple Junction, which includes the region of Cape Mendocino and the Mattole River basin.

The relative regional motions of the tectonic plates have resulted in the landscape that includes the Humboldt Bay region. The regional convergence between the North American and Gorda plates has resulted in the elevation of the Coast Ranges (and in many geological features and phenomena that are not addressed here). The net relative effect of the motions of the three plates in the region of the triple junction has been to create a compressional force along

[4] There are significant faults within the North American and Gorda plates which may produce damaging earthquakes; however these faults are less directly related to the Humboldt Bay setting and are not described here.



Draft Tsunami Hazard Map


Indian Island rookery

the Humboldt County coast that roughly parallels the coastline at Humboldt Bay (i.e., compression in a northeast-trending direction).

The essential effect of this compressional force has been to create a series of "wrinkles" in the region's geology (often analogized to the wrinkles in a stiff rug pushed together from the two ends). The compression has elevated Table Bluff, Humboldt Hill, the Eureka terrace, and a number of other topographically high areas in the Humboldt Bay region, while causing intervening areas (e.g., the Eel River delta) to bend downward. The alternating series of elevated areas and intervening depressed areas that make up the Humboldt Bay regional geography originates from this essential source. The actions through which this landscape has been created are generally known as earthquakes.

The form of Humboldt Bay, with its enclosing sand spits, is a result of differing geomorphological processes. The actions of ocean waves on open coastal landforms and longshore transport result, in a general manner, in the formation of coastal barrier bars and spits across the mouths of coastal embayments. This process has resulted in the formation of barrier bars in the Eel River delta and in the coastal lagoons in Humboldt County, and the process has produced similar results in many other parts of the world.

There is no current evidence that these primary geological processes have ceased to operate, and it is anticipated in this Plan that they will continue to affect the Humboldt Bay region in the future.

While the potential consequences of the geological conditions in the Humboldt Bay region are significant for people in the region, the implications for the Management Plan are more limited, because the District does not have direct responsibility for land uses or other approvals that would significantly affect the exposure of people to risks from these sources. The primary considerations that the potential for seismic events and tsunamis raise for the Management Plan concern the potential effects of these events on harbor-related infrastructure such as docks and shoreline protection.

Major seismic events and tsunamis could result in a variety of effects on the Bay, including the direct destruction of shoreline facilities by shaking, lurching, or other loss of shoreline cohesion; erosion because of tsunami wave forces; potential undermining and an indirect failure because of liquefaction or wave scour; shoaling in bay channels as a consequence of tsunami-shifted sand; or an accumulation of water-borne debris in the Bay's channels.

Seismic-safety planning in the Humboldt Bay region has been refocused within the decade since a CSZ seismic event conclusively demonstrated that the CSZ was as active as other subduction zones. Prior to 1992, the most significant tsunami-related effects known within northern California were associated with the 1964 Crescent City tsunami, which resulted from a subduction-zone seismic event in Alaska, and it was not considered that such tsunami effects might occur from seismic events occurring in the vicinity of Humboldt Bay. Following the 1992 CSZ event near Cape Mendocino, the California Division of Mines and Geology (now the California Geological Survey) issued a report identifying a "design event" for the CSZ (Toppozada and others 1995) that would be expected to be associated with significant seismic-shaking impacts as well as major tsunami impacts. The potential effects in the Humboldt Bay region would not be unlike the effects of the December 2004 seismic event and tsunami in Indonesia. The potential for significantly damaging tsunami waves that would affect Entrance Bay and South Bay in such an event is high.[5]

4.3 Hydrology and Water Quality

Humboldt County, like the majority of California, has a Mediterranean climate, with almost all of its annual precipitation falling (almost entirely as rainfall near Humboldt Bay) between approximately October and April; there is typically little precipitation during the summer, although fog-drip contributes summertime moisture that is important for sustaining coastal forests. This hydrological pattern affects water quality in Humboldt Bay in a number of ways. The Bay's waters typically are warmer in summer, and usually the concentrations of salt in Bay waters are higher then, because of increased insolation in the summer and increased evaporation from the shallow tidal flats. Conversely, the Bay's waters are typically fresher and more sediment-laden in the winter because of the increased upland runoff that flows into the Bay as a consequence of winter storms. Functionally, however, Humboldt Bay is a marine embayment for most of each year, with relatively little freshwater inflow; even during the winter the marine inflow dominates freshwater runoff, and during the summer the Bay is essentially a pocket of seawater between two long sand spits.[6]

4.3.1 General Circulation in Humboldt Bay

Tidal elevations in Humboldt Bay have been well documented as having a "mixed semidiurnal" pattern, with two daily high tides and two low tides; the averages of the two highs typically differ substantially, as do the averages of the two lows.[7] The dynamics of tidewater flows have been evaluated by only a few studies in the past, and while there is general agreement about the pattern of tidewater movement (compare, e.g., Shapiro and Associates 1980 and Barnhart and others 1992), there are substantial uncertainties regarding the detailed patterns of tidewater movements that occur in Humboldt Bay.

In a general sense, flood (rising) tides enter the Bay and move through the larger channels and onto the tidal flats. However, the volume of the Bay is large enough that all of the water that is in Humboldt Bay at the peak of a high tide cannot leave the Bay or be replaced by "new" ocean water during a single tidal exchange. As a result, tidewater that is in the northern part of Arcata Bay (for example) may only reach the vicinity of the Highway 255 bridge on an

[5] See the web page of Redwood Coast Tsunami Work Group for more information at URL: http://humboldt.edu/~geology/earthquakes/rctwg (Site viewed May 2007)

[6] A question that may emerge as a substantive management concern for the Humboldt Bay region is the effect of sea-level increase on the bay and many of its environmental values, and on many of the land uses near the bay as well. While the potential effects of sea-level increase may be significant, the Plan does not currently address these concerns at the present time because the potential trajectory and time frame for the increase is not clear. This is an emerging issue, and the District may reconsider its approach to the issue in an early revision of the Management Plan.

[7] The District's jurisdiction in Humboldt Bay is defined by the average elevation of the higher of the two high tides, known as "mean higher high water."

ebb (falling) tide before the tide turns and a new flood tide begins. "New" seawater entering the Bay entrance at the beginning of a flood tide typically only reaches the part of Entrance Bay near the south end of Indian Island before the next ebb begins [see Shapiro and Associates (1980) and Barnhart and others (1992) for useful discussions of the Bay's tidewater dynamics].

As a general rule, therefore, the Bay does not "turn over" with each tidal exchange; water from different parts of the Bay may remain inside the Bay for one or for a number of tidal cycles. Prior studies have suggested that Entrance Bay experiences a relatively rapid exchange of water with the Pacific Ocean, whereas achieving a nearly complete "turnover" of water in Arcata Bay may require as many as 15 tidal exchanges. There is some evidence that water in both Arcata Bay and South Bay does not mix effectively with the more marine conditions in Entrance Bay, and that water present on the tidal flats may retreat to the deeper channels in Entrance Bay and then move back onto the tidal flats with rising tides.

4.3.2 Watershed Hydrology

The water quality in Humboldt Bay (see following subsection) and the biota in the Bay are affected by runoff from the surrounding seasonal wetlands and the uplands in the basin. It is likely that under pre-settlement conditions rainfall in the basin was delivered to the Bay relatively slowly, and that the quality of the runoff when it reached the Bay was close to that of the rain itself.

Development and other land use changes in the watershed have both changed the runoff patterns and altered the quality of the runoff that reaches the Bay. Many authors have addressed this subject (see, for example, Dunne and Leopold 1978, Pitt 1995, Rhoads 1995, and USEPA 1993). In general, development has well-known effects on the hydrology of small stream basins (Figure 4-1).

The hydrological alterations that result from development and other land uses changes are modulated in most basins by impervious surfaces, a term that refers to concrete, asphalt, wood, and other surfaces that prevent rainfall from contacting and infiltrating soil. Increased impervious surfaces in the Humboldt Bay basin are presumed to have created the kinds of adverse aquatic ecosystem effects that are summarized in Table 4-1 (see USEPA 1993 for a more complete explanation of these relationships).

The hydrological alterations summarized in Table 4-1 are associated with changes in habitat availability and habitat quality in Pacific coastal watersheds for a variety of aquatic species, including salmonids that are listed pursuant to state and federal laws. Applied research in the Puget lowlands in Washington state has indicated that watershed-altering development may have significant effects on salmonids when as little as ten percent (10%) of a basin is under impervious surfaces (Cooper and others 1997, Johnson and Caldwell 1995). Owing to the potential concerns for these species in the Humboldt Bay basin, in combination with the relationships between those species and the management of Humboldt Bay, this Plan identifies these effects as a part of the District's concerns within the basin.

4.3.3 Water Quality

The ambient water quality in Humboldt Bay is generally good, being determined largely by the quality of the water that enters the Bay from the nearshore Pacific. Measured water quality parameters vary through an annual cycle, with water in the Bay being generally warmer than the water in the near-shore Pacific. Water quality parameters vary seasonally and geographically; for example, water in northern Arcata Bay may be both fresher and colder in winter, and warmer and saltier in summer, than in Entrance Bay. Water quality parameters in Entrance Bay, which are significantly influenced by water in the near-shore Pacific, vary in concert with near-shore water quality; during periods of coastal upwelling, for example, Entrance Bay's waters are often colder and saltier than at other times.

The essential water quality requirements for Humboldt Bay are established by the Water Quality Control Plan for the North Coast Region (the "Basin

Effect	Description
Increased Peak Flows	A primary effect of development on the localized runoff hydrology within a localized stream basin is a marked increase in peak stream flow resulting from a given storm event. Increased peak flows are associated with an increased likelihood for out-of-channel flows (i.e., flooding, with both biological and economic implications) and an increased likelihood that stream channel and/or basin morphology will be altered.
Reduced Time-of-Concentration	Development creates increased peak flows by accelerating the delivery of runoff to stream channels. The increased peak flow and reduced time-of-concentration are associated with: (i) increased velocities, causing the loss of instream refuges for fish and invertebrates; (ii) changed substrate sizes and composition, favoring coarser materials because the increased flows remove finer materials, resulting in bed armoring; (iii) lost pools because finer, more mobile sediment materials increase in abundance; and (iv) increased likelihood of channel and streambank erosion, bank failure, and loss of riparian vegetation.
Increased Total Runoff	Development in small drainage basins changes the distribution of incident rainfall between runoff and infiltration. Development causes an increase in the fraction of a given rainfall event that runs off the land surface. The primary cause of this increase in runoff from a given storm event is the increased impervious surface (pavement for streets, sidewalks, and driveways; roofs; and similar impenetrable surfaces) resulting from development.
Reduced Infiltration	The increased fraction of a given rainfall event that leaves a developed catchment is equal to less infiltration into the soil. The primary cause of the reduced infiltration is the impervious surface resulting from development. An additional reason for the increased runoff and reduced infiltration is the development of drainage systems that shorten the distance the runoff must travel, smooth the surfaces over which it flows, accelerate the delivery of rainfall/runoff to natural watercourses, and preclude contact with permeable soil materials.
Increased Stream Power	Stream power refers to the ability of flowing water to move sediment and produce changes in the stream's channel. Stream power increases are directly related to the percentages of tributary watersheds covered by impervious surfaces. The potential for the runoff to change the stream channel is disproportionately concentrated in discharges that recur on average about once every two years in most stream basins (Dunne and Leopold 1978); storms with this recurrence interval have a disproportionate ability to modify channels in the Humboldt Bay basin (Rhoads 1995).
Reduced Base Flow	The greatest ecological effect of development on basin hydrology is reduced base flow because of decreased infiltration. The total volume of rain falling within a stream basin will not change because of development. If more of the rainfall leaves the basin because the land is covered by impervious surfaces, less water will infiltrate into the ground, and less groundwater will be available for discharge to the stream during the summer (base flow). Reduced base flow is associated with increased stream temperatures, reduced oxygen saturation, and a decrease in the total volume of aquatic habitats in the basin.

Table 4-1. Effects of Development on Aquatic Ecosystem Elements.

Plan;" North Coast Regional Water Quality Control Board 2001).[8] The Basin Plan establishes "objectives" for Humboldt Bay, in order to carry out the basic policy that existing "beneficial uses" be maintained and that existing water quality not be degraded. The Bay's beneficial uses are summarized in Table 4-2. The Basin Plan includes numerical criteria for a number of pollutants, but the "narrative criteria" described in the Basin Plan as objectives, together with the basic "antidegradation policy" and the required maintenance of beneficial uses, constitute the overarching state mandate for water quality in Humboldt Bay.

As a general result, most of the ambient water quality parameters that affect biological populations in Humboldt Bay remain favorable throughout the annual cycle. The upwelling that brings colder bottom waters to the surface along the coast is associated with reduced dissolved oxygen concentrations in Bay waters, which may not meet the narrative criteria in the Basin Plan, but this variation is, effectively, a natural phenomenon rather than a Basin Plan violation.

Municipal wastewater is no longer discharged directly to Humboldt Bay, as was true until approximately the mid-1980s. The City of Arcata discharges treated effluent from its Publicly Owned Treatment Works (POTW) into Arcata Bay, a discharge that is consistent with the Basin Plan (and the state's Bays and Estuaries Policy) because the discharges result in additional elements of several beneficial uses that would not be present without the City's effluent. The City of Eureka operates its POTW to discharge treated effluent into Entrance Bay on outgoing tides, effectively a discharge to the Pacific Ocean.

[8] Many water quality plans and policies exist in California, including a number that affect Humboldt Bay. See URL: http://www.waterboards.ca.gov/plnspols/index.html. (Site viewed February 2007.)

Grazing on agricultural lands surrounding Humboldt Bay

More significant water quality concerns arise as a consequence of surface runoff from the lands surrounding the Bay. Surface streams draining developed areas deliver a variety of toxic and nontoxic nonpoint source pollutants to Humboldt Bay (Table 4-3), although the pollutant loadings are generally within limits that are consistent with the Basin Plan. Potential water quality concerns related to individual waste treatment systems in unincorporated parts of the watershed remain an ongoing issue with respect to bacterial pollution in the Bay. Runoff from agricultural lands in the Bay's watershed seasonally delivers elevated bacterial loadings to the Bay, which may exceed the standards in the Basin Plan and also exceed California Department of Health Services standards for waters from which maricultural products are harvested. Maricultural operations are normally suspended until the Bay's water quality returns to levels that comply with the established requirements.

An additional water "quality" concern that has arisen recently is the introduction of exotic species into American waters through commercial vessel deballasting in American ports. This concern may be more appropriately considered under a general heading of exotic species management (see below).

The District is a member of the Humboldt Bay Oil Spill Cooperative, responsible for responding to marine-related releases of petroleum products and related toxic materials into Humboldt Bay. The District does not have direct responsibility for spill prevention or cleanup. The United States Coast Guard maintains the primary responsibility for spill prevention and cleanup in marine waters pursuant to the Oil Pollution Act of

1990. NOAA Fisheries is responsible for responding to potential effects to marine mammals. The Department of Fish and Game's Office of Spill Prevention and Response is responsible for state-level spill responses regarding wildlife and habitat.

In general, the District does not exercise direct regulatory authority over water quality in Humboldt Bay. The District does, however, have the authority to regulate certain uses within the Bay that may be associated with water quality concerns. In these circumstances, the District may require practices or physical measures that have been demonstrated to have beneficial effects on water quality.

4.3.4 Sediment Dynamics Related to Runoff

As noted above (subsection 4.2.1), sedimentation in Humboldt Bay clearly has two sources, and the primary source has been identified as the near-shore Pacific (that is, sediment delivered to Humboldt Bay by inflowing tidewaters). The District's responsibility for maintaining navigable depths in the Bay elevates the District's interest in sediment management within the Bay's watershed, although the District lacks authority to constrain land use practices in the basin.

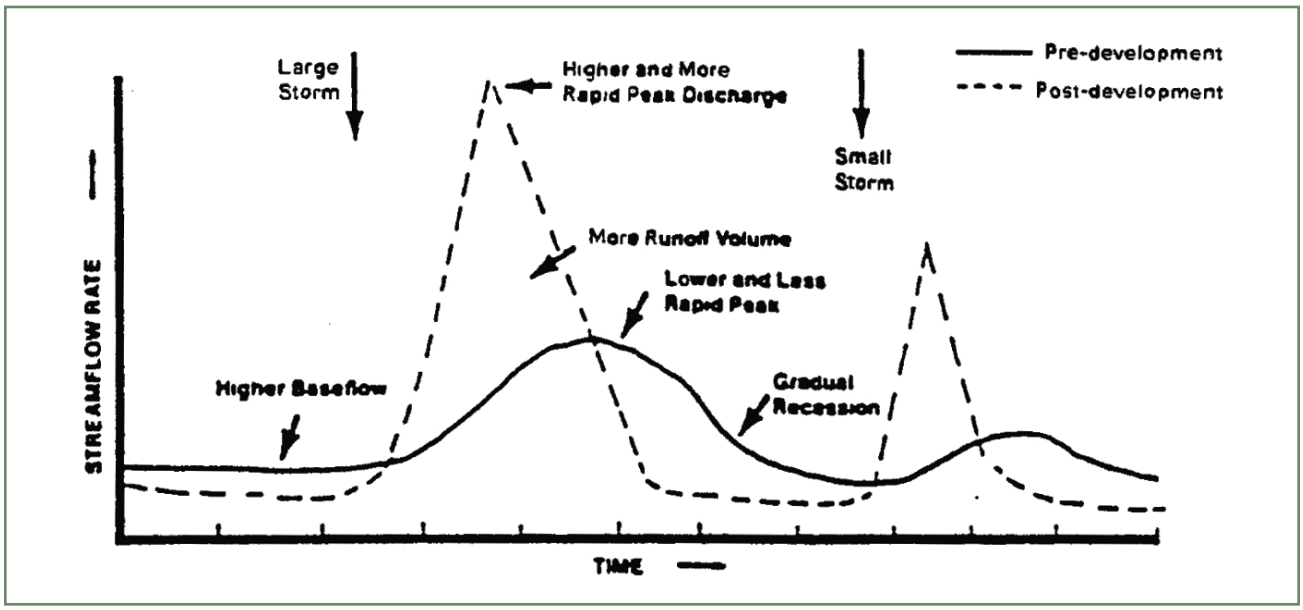
As a general perspective on sediment distribution in Humboldt Bay, it may be useful to consider sediment distribution to be an element in a dynamic equilibrium with the capability of tidal currents to redistribute sediment delivered from the watershed or the inlet. Tidal dynamics (particularly in combination with wind-driven waves) within the Bay characteristically rework the tidal flats, distributing the sediments according to the capability of tidewaters for moving sediment. Fine sediments (e.g., clays and silts) are characteristically carried by slowly moving tidewater to higher elevations (the "high flats" and "salt marshes" described by Shapiro and Associates 1980). Coarser sediments (e.g., fine sands) are generally moved by more competent flows and end up in the lower intertidal and shallow subtidal zones near smaller channels. The stronger and more turbulent flows in larger channels have a greater competence for moving sediment, and fine sediments are carried out of these larger channels, leaving them dominated by coarser sands, with gravels and larger shell debris in the largest channels.

At the present time it is unclear whether sediment produced within the Humboldt Bay watershed significantly affects the aquatic environment once the sediment reaches tidewater. Recent studies carried out in Arcata Bay related to the effects of mariculture found that the sediment surface elevation first increased, then decreased, and that there was no net sediment surface elevation change over the course of a recently completed three-year study (S. Rumrill, pers. comm.).

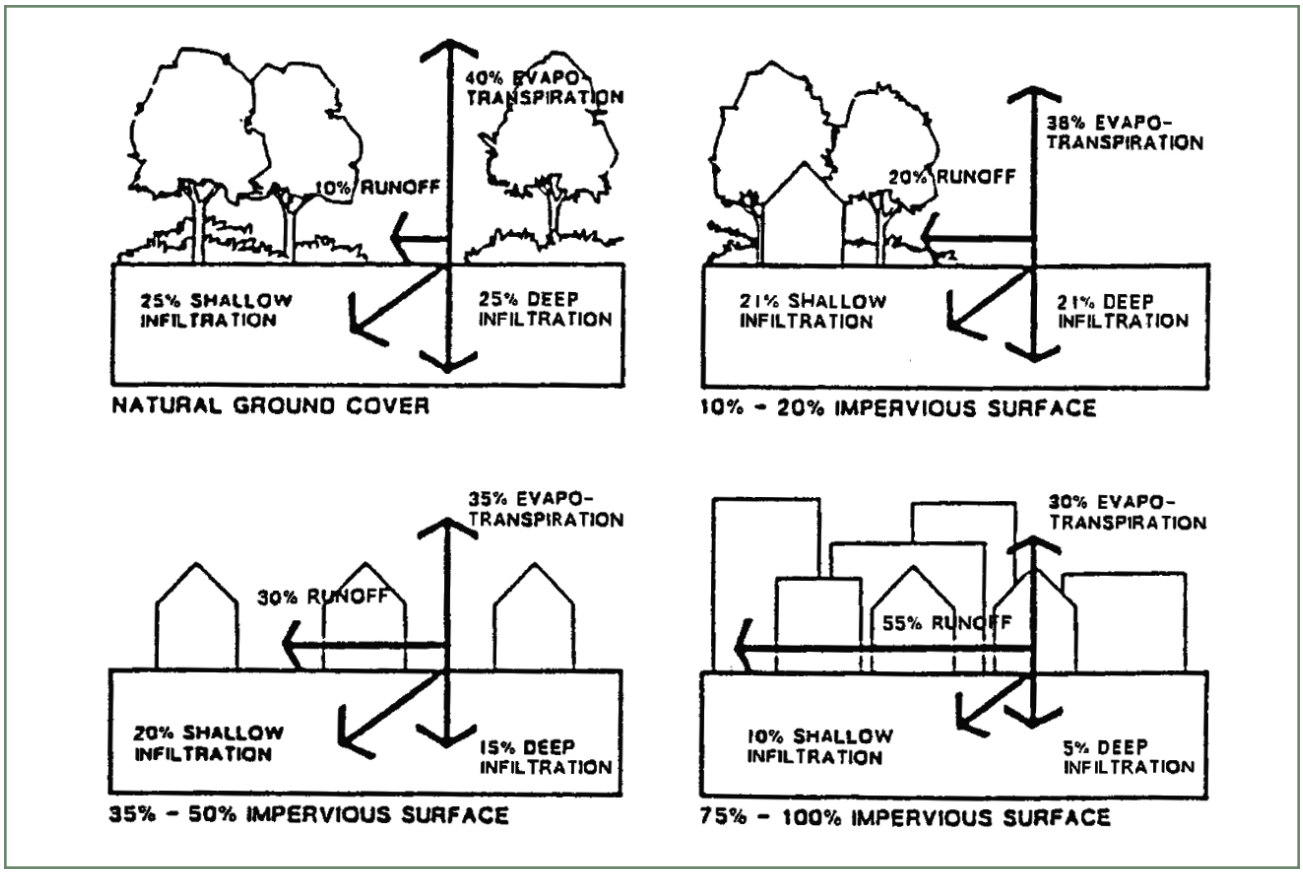
This Plan recognizes that a basin-wide concern exists with respect to the sediment mobilization effects of land use practices such as forestry or development. The potential effects of sediment mobilization may include the accumulation of sediment in surface watercourses, with attendant impacts on instream aquatic habitat values. Sediment accumulation may also affect the capability for surface streams to convey storm flows without flooding. When sediment mobilized in the Humboldt Bay watershed reaches the Bay the finer sediments are likely to be distributed according to the dynamic model summarized above, and excess fine material may be exported from the Bay on outgoing tides. Coarser sediments are likely trapped within the larger tidal channels in the Bay, thereby increasing the shoaling that adversely affects navigation.

4.4 Ecosystem and Environmental Resource Patterns

The Humboldt Bay Management Plan does not address the entire Humboldt Bay watershed; nor does the Plan address the nearshore Pacific Ocean. The District's primary area of concern (the Plan Boundary) includes the intertidal and subtidal land within the Bay; the District also has a secondary area of management concern (the Sphere of Interest) that includes additional lands that would have come under District jurisdiction had the District existed in 1850 (see Section I; the District has an additional interest in the remainder of the Humboldt Bay watershed, primarily in terms of how events in the watershed may affect concerns that lie under the District's direct jurisdiction). The



Changes in stream hydrology as a result of urbanization (Schueier, 1992).



Changes in runoff flow resulting from increased impervios area (NC Depatment of Natural Resources and Community Development, in Livingston and McCarron, 1992).

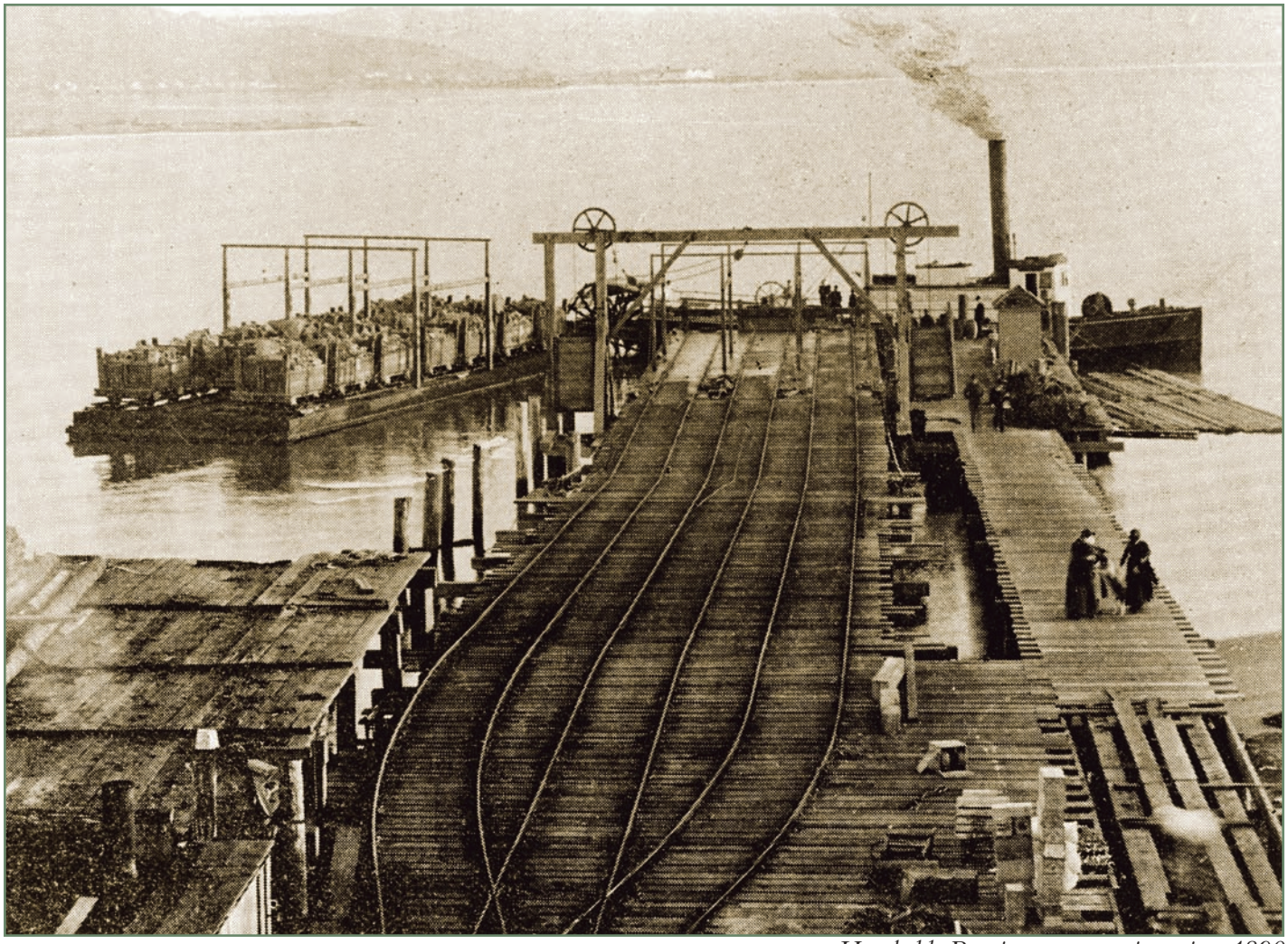
Figure 4-1. Effects of site development on hydrology. Increasing impervious surface decreases infiltration, increases total runoff, increases peak discharge, reduces time-of-concentration, and decreases base flow. (Sources: USEPA 1993)

Beneficial Use	Description
Agricultural Supply (AGR)	Crop, orchard, and pasture irrigation, stock watering, support of vegetation for range grazing, and all uses in support of farming and ranching operations.
Industrial Service Supply (IND)	Uses that do not depend primarily on water quality, such as mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well repressurization.
Navigation (NAV)	Commercial and naval shipping.
Water Contact Recreation (REC-1)	All recreational uses involving actual body contact with water, such as swimming, wading, water-skiing, skin diving, surfing, sport fishing, uses in therapeutic spas, and other uses where ingestion of water is reasonably possible.
Non-Contact Water Recreation (REC-2)	Recreational uses which involve the presence of water but do not require contact with water, such as picnicking, sunbathing, hiking, beachcombing, camping, pleasure boating, tidepool and marine life study, hunting, and sightseeing and aesthetic enjoyment in conjunction with the above activities.
Ocean Commercial and Sport Fishing (COMM)	The commercial collection of various types of fish and shellfish, including those taken for bait purposes, and sport fishing in oceans, bays, estuaries, and similar non-freshwater areas.
Cold Freshwater Habitat (COLD)	A cold water habitat to sustain aquatic resources associated with a cold water environment.
Wildlife Habitat (WILD)	Water supply and vegetative habitat for the maintenance of wildlife.
Preservation of Rare and Endangered Species (RARE)	Aquatic habitat necessary, at least in part, for the survival of species established as rare and endangered species.
Marine Habitat (MAR)	Provides for the preservation of the marine ecosystem, including the propagation of fish, shellfish, marine mammals, waterfowl, and vegetation such as kelp.
Fish Migration (MIGR)	A migration route and temporary aquatic environment for anadromous and other fish species.
Fish Spawning (SPWN)	A high quality aquatic habitat especially suitable for fish spawning.
Shellfish Harvesting (SHELL)	The collection of shellfish such as clams, oysters, abalone, shrimp, crab, and lobster for either commercial or sport purposes.
Estuarine Habitat (EST)	Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).
Aquaculture (AQUA)	Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

Table 4-2. Humboldt Bay's Designated Beneficial Uses.

Source	Pollutants of Concern
Erosion	Sediment and attached soil nutrients, organic matter, and other adsorbed pollutants.
Atmospheric Deposition	Hydrocarbons emitted from automobiles, dust, aromatic hydrocarbons, metals, and other chemicals released from industrial and commercial activities.
Construction Materials	Metals from flashing and shingles, gutters and downspouts, galvanized pipes and metal plating, paint, and wood.
Manufactured Products	Heavy metals, halogenated aliphatics, phthalate esters, polycyclic aromatic hydrocarbons, other volatiles, and pesticides and phenols from automobile use, pesticide use, industrial use, and other uses.
Plants and Animals	Plant debris and animal excrement.
Non-Stormwater Connections	Inadvertent or deliberate discharges of sanitary sewage and industrial wastewater to storm drainage systems.
Onsite Disposal Systems	Nutrients and pathogens from failing or improperly maintained or sited systems.

Table 4-3. Sources of Urban Runoff Pollutants (Source: USEPA 1993)



Humboldt Bay jetty construction, circa 1890

majority of the lands that lie within the geographical boundaries that include the Plan Boundary and the Sphere of Interest are wetlands or deep-water aquatic habitat areas under federal or state law, excluding levees, docks, other shoreline structures and adjacent upland areas. Considering the ecological values of the areas covered by the Plan requires a consideration of wetlands and deep-water habitats.

The wetlands and deep-water habitat in Humboldt Bay are addressed extensively in existing studies; see, particularly, Monroe (1973), Shapiro and Associates (1980), Proctor and others (1980), and Barnhart and others (1992). In addition to these major treatises there exists a plethora of academic or agency research reports, development-related environmental studies addressing ecological conditions in Humboldt Bay, studies associated with existing environmental and land use plans (including the adopted and draft General Plans of the cities of Eureka and Arcata and the County of Humboldt), and documents of other kinds. In consequence, the general status of the large variety of ecosystem elements in the Humboldt Bay region has been characterized in greater-than-sufficient detail to allow informed actions by District (and other) decision-makers; this chapter therefore includes only summaries of relevant information, as well as indications of contexts in which current resource-management perspectives may differ somewhat for views described in existing studies and reports.

4.4.1 Aquatic Ecosystem Elements

From a management perspective (and also a regulatory perspective), essentially all of the areas subject to the District's jurisdiction are wetlands or "deep-water" habitats;[9] the majority of the Sphere of Interest is composed of wetlands. While there are several regulatory definitions of wetland and other environmentally sensitive habitat types, and while there may be subsequent discussions about regulatory jurisdictions that affect this Plan, this chapter essentially identifies the aquatic features in most of the Plan Boundary and the Sphere of Interest as wetlands or deep-water habitats.

A classification system (which may be considered as a useful way of organizing aquatic habitat areas that helps to recognize them and order them in discussions) that is generally recognized for wetlands and deep-water habitats is the classification used for the National Wetland Inventory (NWI); this system is based on the classification system established in Cowardin and others (1979). The wetlands and deep-water habitats in Humboldt Bay have been classified and mapped (by the U. S. Fish and Wildlife Service) according to the NWI protocol; this classification and map may be reviewed on the District's website,[10] and is discussed further below.

The NWI process places wetlands into one of five "systems," each of which contains two or more "subsystems," each of which contains two or more "classes." Most classes have two or more "subclasses," and a series of "modifiers" are available for salinity, duration of inundation, vegetation type, and other such factors. Humboldt Bay essentially lacks wetlands classifiable in the ***Lacustrine*** system, pertaining to lakes. A second system, the ***Marine*** system, is represented in the area by two wetland types; this system refers to ocean-exposed wetlands. ***The Riverine*** system (pertaining to in-channel river wetlands) is represented by one or two types. A number of wetland types occur in the ***Estuarine*** system, and an even larger number in the ***Palustrine*** system (which includes all wetlands not assignable to any of the other four systems). Because the NWI classification is widely used, an appropriate NWI code is presented for each wetland identified in this subsection. A summary of study area wetland types is included in Table 4-4, which summarizes the wetland types by NWI system, and which also provides vernacular name.

[9] As noted below, deep-water habitats are aquatic habitat areas that are generally considered to be too deep for submerged or emergent aquatic vegetation; generally deep-water habitats are permanently flooded areas greater than two meters (6.6 feet) deep, but if aquatic plants grow in deeper water, the depth at which deep-water habitat begins is generally considered to be the depth at which plants no longer occur.

[10] See URL: http://www.humboldtbay.org/gis/interactivemap.html. Select the "Humboldt Bay Atlas," select "Interactive Map," and then select "Biological Characters." Check the NWI box. Uncheck (turn off) the default mapping for high and low tides in the appropriate folders. (Site viewed May 2007.)

NWI Code	NWI Description	Common Name in Region
Marine System		
M2US	Marine intertidal unconsolidated shore	Beach
M2RS	Marine intertidal rocky shore	Jetty; rip-rap
Estuarine System		
E1UB	Estuarine subtidal unconsolidated bottom	Bay bottom; shallow and deep channels; may be subcategorized by bottom type
E1AB	Estuarine subtidal aquatic bed	Vegetated subtidal channels and bottom
E2AB	Estuarine intertidal aquatic bed	Eelgrass beds; algal beds
E2UB	Estuarine intertidal unconsolidated bottom	Low tidal flats
E2US	Estuarine intertidal unconsolidated shore	Most tidal flats; dike; levee; shoreline; may be subcategorized by bottom type
E2RS2	Estuarine intertidal rocky shore (rubble)	Rip-rapped shoreline
E2EM1	Estuarine intertidal persistent emergent marsh	Saltmarsh
Riverine System		
R1UB / R2UB	Riverine unconsolidated bottom, tidal/lower perennial	Unvegetated river bottom or stream bottom
R1AB / R2AB	Riverine aquatic bed, tidal/lower perennial	Vegetated river bottom or stream bottom
Palustrine System		
PUB	Palustrine unconsolidated bottom	Cutoff slough streams; major drainage channels; seasonal creeks; unvegetated beds and flowing water
PAB	Palustrine aquatic bed	Vegetated seasonal creekbeds and major drainage channels with flowing water
PEM1	Palustrine persistent emergent	Brackish and fresh emergent marshes with persistent vegetation; some dune hollows
PEM1C	Palustrine persistent emergent, seasonally flooded	Farmed wetlands; diked former tidelands
PSS	Palustrine scrub-shrub	Some dune hollows [with woody vegetation <6 m (20 feet) tall]
PFO1/4	Palustrine forested deciduous/coniferous	Floodplain riparian forests; swamps; some dune hollows [with woody vegetation >6 m (20 feet) tall]

Table 4-4. A Summary of Common Wetland Types Found Within the Humboldt Bay Region.

Wetland/Deepwater Category	Area (Hectares/Acres)
Estuarine Subtidal Aquatic Bed	107 / 264
Estuarine Subtidal Unconsolidated Bottom	2389 / 5901
Estuarine Intertidal Aquatic Bed	1605 / 3964
Estuarine Intertidal Unconsolidated Shore Mud	2624 / 6481
Estuarine Intertidal Unconsolidated Shore Sand	24 / 60
Estuarine Intertidal Emergent Marsh	392 / 969
Total	7141 / 17,639

Table 4-5. Areas of NWI Intertidal and Subtidal Wetlands and Deepwater Habitats in Humboldt Bay.

4.4.1.1 Intertidal and Subtidal Habitats in Humboldt Bay

The District's primary jurisdiction in Humboldt Bay covers intertidal and subtidal aquatic ecosystem types (the District's jurisdiction also includes areas that are not intertidal or subtidal, such as saltmarsh wetlands on Woodley Island). These Humboldt Bay habitats include the channels in Humboldt Bay; the tidal flats, including areas dominated by algal and diatom mats; eelgrass beds, salt and brackish marshes, and unvegetated and rock-covered levees.

The NWI mapping for Humboldt Bay identified approximately 7139 hectares[11] (17,639 acres) of intertidal and subtidal wetland and deepwater habitat in Humboldt Bay (Table 4-5). An alternative ecological differentiation within this classification of wetlands and deepwater areas is to consider subtidal areas and intertidal areas (Figure 4-2); even the highest subtidal areas are seldom exposed, and marine species may occupy subtidal areas continuously without the physiological stress that accompanies periodic sub-aerial exposure. Figure 4-2 also illustrates intertidal emergent marshes that were identified by the Fish and Wildlife Service.

It should be noted that the NWI mapping criteria result in identifying intertidal flats as "unconsolidated shore," and the majority of the Bay's mudflats are included in the category in Table 4-5 named "Estuarine Intertidal Unconsolidated Shore Mud." Aquatic bed categories include both eelgrass- and algae- dominated areas; the majority of the "Estuarine Intertidal Aquatic Bed" area identified in Table 4-5 is eelgrass bed.

Tidal Channels and Tidal Flats. The channels and tidal flats in Humboldt Bay are the habitat locus for the majority of the invertebrate species found in the Bay. The summary provided of invertebrate usage in Barnhart and others (1992: Appendix B) identifies invertebrate habitat usage according to the predominant habitat used by each species; the majority of the described species are associated with sandy and/or muddy substrates. On this basis alone the tidal channels and tidal flats in the Bay must be considered to be significant habitat types.

Most of the larger invertebrate species burrow into the Bay bottom or into channel walls; these species are often referred to as "benthic infauna;" the contrary habitat use, on the bottom itself, is often referred to as "benthic epifauna." Other invertebrate species are "epifaunal" on other organisms, often eelgrass. Appendix B in Barnhart and others (1992) indicated that there were at least 300 invertebrate species in Humboldt Bay; an accurate assessment of the invertebrate fauna of Humboldt Bay does not exist, but the number of invertebrate species known from the Bay now exceeds 500. It is likely that this number will continue to increase, both because species that are already present in the Bay will continue to be discovered and because additional species are likely to be introduced.

The benthic invertebrate fauna in Humboldt Bay is intimately linked to the importance of the Bay for human interests. As summarized in subsection 4.4.4, the energy relationships in the Bay flow from primary producers (see below) through an essentially mysterious invertebrate fauna into larger, commercially or recreationally valuable invertebrates (such as crabs, clams, and oysters) or into commercially or recreationally valuable vertebrates like fish and birds. The relationship that supports this pattern is called a "food pyramid," which is founded on a broad trophic base of primary production, and in which the thick middle levels of the pyramid are the countless millions of invertebrates that form the food supply for the fewer and larger predators near the top of the pyramid. Without an adequate and thriving population of the primary invertebrate consumers (and equally healthy levels of plants and other producers below that), Humboldt Bay cannot support the top levels of the pyramid.

The tidal flats also include two of the primary sources of fixed sunlight that support the rest of the community: algae and eelgrass (see subsection 4.4.4). The tidal flats are often considered to be "barren," but (especially in the summer) the surfaces of the flats are covered with a "biofilm" of diatoms, other algae, and

[11] The total area in hectares identified in Table 4-6 differs owing to rounding error.

Low tide South Bay

Chitons may be found on rocks and other structures in Humboldt Bay

Wolf-eel (Photo by Chad King)

bacteria that are producing significant amounts of both dissolved and particulate organic material. The significance of this organic material is second only to that of eelgrass in terms of sustaining the ecosystem in Humboldt Bay.

See the summary in Chapter 4 in Barnhart and others (1992) for additional information.

Bay Waters. The waters in Humboldt Bay compose a second major division of the Bay's overall ecosystem. The Bay's waters are the "home" of the fish that occur in the Bay. Barnhart and others (1992) identify more than 100 species within the Bay; current information indicates that there are more than 120 species, and more are likely to be identified in the future. A number of these species are commercially and recreationally important (see subsection 4.4.3, for example).

In a basic sense, Humboldt Bay exists as an ecosystem because the Bay's waters are the medium in which nutrients for plant growth and food for animal growth are moved across the channels and flats. That is, the waters of the Bay are both an essential habitat for many species of organisms while at the same time being a necessary ecological "solvent" or "vehicle" that carries the nutrients and food to the living species in the Bay, so that they can grow and reproduce.

The Bay's waters do not have a repeatably observable "structure," in the sense that the ecosystem will appear the same over extended time intervals; even identifying the dynamics of tidewater flow has proved difficult, but there do not appear to be well-described zones or strata within the Bay's waters. As noted elsewhere in this summary, the Bay's waters do develop temporal variations (both seasonal and daily) in temperature and salinity, and these variations appear to be associated with real biological effects in the biological communities in the Bay; however, it is unknown whether these variations have any particular ecological or evolutionary significance.

Perhaps the most salient fact about the Bay's waters is, however, their sensitivity to effects occurring

externally. As noted elsewhere, for example, when upwelling occurs of the coast, the dissolved oxygen levels in the Bay decline. When runoff from the watershed resulting from early fall storms reaches the Bay, the pollutant loading in the water ceases to meet requirements for commercial mariculture established by the state Department of Health Services. The water in Humboldt Bay is the "integrator" of the changes that occur in the entire Bay watershed as well as those in the nearby Pacific Ocean. The District has identified a policy approach for maintaining the conservation values in Humboldt Bay that is closely related to the "health" of the Bay's waters (see Section III).

Eelgrass. Eelgrass (*Zostera marina*) is a perennial aquatic grass that grows in muddy to fine-sand substrates within Humboldt Bay, generally near the elevation of "Mean Lower Low Water," and extending to both higher and lower elevations. Eelgrass occurs in extensive stands throughout much of Arcata Bay, and in virtually all of the parts of South Bay that occur at suitable elevations. The eelgrass meadows in Arcata Bay are typically less dense than those in South Bay. Historical studies in Humboldt Bay have demonstrated that both the area covered by eelgrass and the density of eelgrass stems within occupied areas varies through time. Computations reported in Barnhart and others (1992) indicated that almost half of the primary production in Humboldt Bay may result from eelgrass (see subsection 4.4.4), but the seasonal and annual variability in eelgrass productivity is not well understood, and it is not certain how eelgrass in Humboldt Bay varies through time, nor even how closely the stands in Arcata Bay compare with those in South Bay.

Eelgrass has long been recognized as an important habitat for some fish and wildlife species (see subsection 4.4.4 below with respect to its significance for Pacific brant; see Phillips 1984 for a general discussion of eelgrass meadow ecology in the Pacific Northwest). Currently eelgrass meadows are generally thought to provide foraging habitat or cover for a variety of fish and invertebrate species, including species that have commercial value and species that are listed under the federal or state Endangered Species Act, based on study results from other locations along the Pacific coast. The use of eelgrass meadows by several of the sensitive species is not firmly established for Humboldt Bay or other similar open embayments, however, and the uncertainty regarding the ecological role (or roles) of eelgrass is a source of management contention (see subsection 4.5.4 below).

Agencies of the federal government have adopted a "no net loss" policy for eelgrass in southern California estuaries; the Department of Fish and Game has expressed a similar position for all state waters. Conversely, eelgrass in several estuaries in Washington State has been removed, historically, to facilitate commercial shellfish aquaculture. The regulatory status of eelgrass in Humboldt Bay is not clearly established at the present time. Personnel from several federal and state agencies and academic institutions are involved in research on various elements of eelgrass ecology, although typically little of this work occurs in Humboldt Bay. District staff members frequently confer with research and regulatory agency personnel about eelgrass studies, and the District participates in several monitoring efforts that track eelgrass coverage in Humboldt Bay.

The District considers eelgrass management in Humboldt Bay to be an important and ongoing concern for the Management Plan. Several management issues involve questions about effects of various human activities on eelgrass, the most publicly evident perhaps being the relationships among oyster aquaculture and eelgrass coverage and productivity in Arcata Bay, although those specific questions are secondary to larger questions about the role of eelgrass management in the overall focus of the HBMP.[12]

Saltmarshes. Saltmarshes in the Humboldt Bay region mostly occur outside levees, where the land surface is exposed to tidewater; remnants of salt-tolerant vegetation also may persist in diked former tidelands that are not heavily managed, although these areas are not hydrologically tidal. Saltmarshes in Humboldt

[12] The relationships among eelgrass and several Plan elements and policies will be explored in the Environmental Impact Report for the Management Plan.

Figure 4-2: Humboldt Bay Wetlands. Three main categories depicted, subtidal wetlands (channels and deepwater), intertidal bottom and shore with marshes excluded, and intertidal marshes.

Bay are dominated by the introduced dense-flowered cordgrass (*Spartina densiflora*) and native pickleweed (*Salicornia virginica*). At progressively higher elevations the salt content of the water is reduced by rainwater, and other plant species may appear, including jaumea (*Jaumea carnosa*), arrowgrass (*Triglochin maritimum*), spearscale (*Atriplex triangularis*), saltmarsh bulrush (*Scirpus robustus*), tufted hairgrass (*Deschampsia cespitosa*), and gumplant (*Grindelia stricta var. stricta*). Many of these higher-elevation species occupy a remnant "high marsh plain," which was the surface of the saltmarsh in Humboldt Bay at the time of European colonization.

Saltmarshes in the Bay have been reduced substantially in area with respect to their pre-settlement extent, and they continue to be lost. In addition, the extant saltmarshes are degraded by the dominant presence of dense-flowered cordgrass. The benefits of shoreline-protecting saltmarshes for stabilizing sediment and protecting shoreline structures from wave impacts combine with a conservation focus on maintaining or restoring saltmarshes to make the restoration or enhancement of salt marshes an important concern for the District.

The ecological dynamics that occur within saltmarshes in Humboldt Bay are not completely understood. The roles that saltmarshes play in ecosystem food webs, nutrient cycling, and other ecological processes are not well described. The effects of the invasive cordgrass species, *Spartina densiflora*, in altering the roles of saltmarsh dynamics in Humboldt Bay is also not well known. (A. Pickart, *in lit.*).

Other Habitats. As indicated in Barnhart and others (1992), there are additional subtidal and intertidal habitat types that are important for invertebrate species in Humboldt Bay, such as rocks or pilings. A number of the invertebrate species that occur in Humboldt Bay are "fouling" species and typically colonize the outsides of (or burrow into) hard substrates such as these. Other, more mobile species use these habitats as refuges or foraging areas at appropriate tidal elevations.

The ecological and conservation significance of these other habitat types is not well understood. Because some of them are associated with shoreline structures and shoreline management, the District has identified a need to develop additional information about these habitat types, as well as to consider suitable methods for compensating for losses that may be associated with harbor-related projects.

4.4.1.2 Diked Former Tidelands and Seasonal Wetlands

The District's "Sphere of Interest" (see Section I) includes a substantial area of lands that are currently not subject to the ebb and flow of the tide, although these areas all appear to have been part of the intertidal area of Humboldt Bay at the time California became a state, and as such are subject to the Public Trust. As noted previously, Monroe (1973) estimated the area of the "diked former tidelands" to be about 11,000 acres (about 4330 hectares).[13]

The dominant species in these grass-dominated former saltmarsh habitats today usually are the introduced Eurasian perennials velvetgrass (*Holcus lanatus*) and vernalgrass (*Anthoxanthum odoratum*); a number of other Eurasian species may be present, depending on location and site history. Fescue (*Festuca*) species, orchardgrass (*Dactylis glomerata*), and one or more ryegrass (*Lolium*) species are common. Redtop (*Agrostis stolonifera*) and tall fescue (*F. arundinacea*) are common components in farmed wetlands. The native water foxtail (*Alopecurus geniculatus*) may dominate very wet sites. An invasive species, reed canary grass (*Phalaris arundinacea*), is becoming increasingly prevalent in diked former tidelands in the Arcata Bay region.

The grasses commonly co-occur with herbaceous broadleaved forbs, such as one or more *Hypochoeris* (false dandelion) species, English plantain (*Plantago lanceolata*), and one or more trefoil (*Lotus*) species. The variety of forb species that occur in grasslands is considerable, and is only partly dependent on degrees of wetness.

[13] These extensive wetland areas are summarized briefly here because they do not fall under the District's present direct jurisdiction; it should be noted that future implementation programs for several policies identified in Section III may necessitate more thorough studies and descriptions of ecological processes in these wetlands.

In wet pastures, silverweed (*Potentilla anserina*) and creeping buttercup (*Ranunculus repens*) are common in mowed/grazed areas; taller vegetation generally lacks the shorter-statured forbs.

Most pastures in the Humboldt Bay region, at nearly all elevations, have rushes (*Juncus*); the most common is soft rush (*J. effusus*), although several other species may be found. Other narrow-leaved monocots that may be present (or even dominant) include spike-rush (typically *Eleocharis macrostachya*) and sedges, especially slough sedge (*Carex obnupta*) and (recently in some parts of the watershed) Lyngbye's sedge (*C. lyngbyei*). Many of these perennial wetland dominants are more common near "cutoff" former sloughs or depressions that receive more flooding than in pasture areas (A. Pickart, *in lit.*; see Leppig and Pickart 2005 for additional information).

The pastures invariably are colonized by low-growing woody vines and shrubs, and dense stands of sedges intermixed with vines, unless removed, ultimately tend to replace the grasslands. Blackberry (*Rubus ursinus*) is virtually ubiquitous; hymalayaberry (*R. discolor*) is favored in disturbed areas. Coyotebrush (*Baccharis pilularis*) usually colonizes mounded soil and levees. If seed sources occur nearby, wild rose (*Rosa nutkana*) may colonize near moist areas. In very wet areas, cascara (*Rhamnus purshiana*) is a common colonist, and willows [*Salix* spp., especially arroyo willow (*S. lasiolepis*)], may invade. These areas would likely become "riparian forest" if the woody species were not regularly removed, as has happened in diked former tidelands in the Eel River delta and the Redwood Creek estuary; the community structure in such forested areas eventually becomes dominated by Sitka spruces (*Picea sitchensis*) and other wetland-associated conifer species (see following subsection).

As with other habitat types discussed in this summary, the perennial grasslands that are the primary habitat type within the diked former tidelands are used by species that find appropriate foraging opportunities, shelter, and other conditions that allow them to maintain reproducing populations. Many of the areas that are not inundated for long periods in the winter have faunal compositions like those of annual grasslands, with occasionally abundant rodent populations that support hawks and other aerial predators as well as herons and egrets. These semi-terrestrial communities have not been studied or described scientifically.

In the rainy season, large areas of these diked former tidelands are often saturated, or even inundated, for prolonged periods. "Cutoff" sloughs are frequently converted to broad, shallow ponds. During these periods these former tidelands function as shallow freshwater wetlands, and are important habitat areas for waterfowl and shorebirds (see Colwell and Dodd 1997). The diked former tidelands are increasingly being used during the period between February and April by Aleutian geese (*Branta hutchinsii leucopareia*).

4.4.1.3 Rivers, Streams, and Riparian Areas

Rivers and streams constitute a wetland type ("riverine" wetlands), and the streams are hydrologically interrelated with "palustrine" wetlands that occur on the adjacent floodplains. The general focus for these ecosystem elements has recently evolved to accommodate the understanding that the stream, the floodplain through which the stream flows, and the riparian habitats occupying the floodplain function as interconnected elements that both provide and protect the functional utility of the aquatic ecosystem.[14] The distribution of riparian plant species is directly affected by streamflow patterns, including dry-season base flows as well as overbank "flood" flows [see the National Research Council (2002) report for an overall summary]. Organic material produced in this riparian context often falls into streams, contributing to the ecosystem structure and productivity within the streams. The riparian vegetation shades the watercourses during the summer, helping to keep water temperatures down. Riparian trees that fall into the watercourses provide large organic structural elements that help to shelter instream organisms, including fish. See Leppig and Pickart (2005) for additional descriptions of these wetland and riparian habitat types.

[14] The hydrological relationships among streams, riparian wetlands, floodplains, and adjacent uplands are described and illustrated in Winter and others (1998); this excellent reference may be downloaded (large PDF document!) from: http://water.usgs.gov/pubs/circ/circ1139/ (viewed May 2007).

Red alder (*Alnus rubra*) may be the most important riparian tree species in the Humboldt Bay region, reflecting high values for this species of both prevalence and cover. The deciduous tree species with the largest individuals in these forests is black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), but this species is much less common than alder. These forests commonly also include conifers, typically Sitka spruce (*P. sitchensis*) and redwood (*Sequoia sempervirens*); in some less-modified riparian forests western red cedar (*Thuja plicata*) sometimes attains substantial coverage and western hemlock (*Tsuga heterophylla*) is still present as scattered individuals.

Humboldt Bay wallflower

The most common willow species in the riparian forestlands in the Humboldt Bay basin is the arroyo willow (*Salix lasiolepis*), which is a pioneer species in these forests. Three other willow species occur in Humboldt Bay deciduous riparian corridors; pacific willow (*S. lucida* ssp. *lasiandra*) is a relatively common tree, Sitka willow (*S. sitchensis*) is a commonly encountered shrub, and Hooker willow (*S. hookeriana*) is a shrubby species mostly but not entirely restricted to dune habitats.

Great blue heron

The floodplain riparian forests along the northwest Pacific coast typically have an open overstory that allows a relatively dense, but short-statured, shrub layer to develop. Often the dominant species in these stands is salmonberry (*Rubus spectabilis*), which may form impenetrable "doghair" stands several meters tall. Other woody shrubs that may occur in these floodplain forests include thimbleberry (*Rubus parviflorus*), cascara (*Rhamnus purshiana*), twinberry (*Lonicera involucrata*), Oregon crabapple (*Malus fusca*), and red elderberry (*Sambucus callicarpa*).

Numerous fish in Humboldt Bay are included in Essential Fish Habitat designations

Dominant understory plant species in these wetlands may include slough sedge (*Carex obnupta*), skunk cabbage (*Lysichiton americanum*), small-fruit bulrush (*Scirpus microcarpus*), soft rush (*Juncus effusus*), and water parsley (*Oenanthe sarmentosa*). In floodplains that lack a dense forest overstory or a dense shrub understory a "sedge meadow" may develop that is more than two meters tall. However, the floodplains

typically are colonized by woody species, and the usual appearance of these floodplain wetlands would present a mixture of emergent shrubs (usually including abundant salmonberry) above an herbaceous layer dominated by slough sedge.

Riparian habitats are among the most important habitats in North America for wildlife (see, e.g., Thomas 1979, Naiman and others 1993). For example, 285 of the 378 terrestrial wildlife species (75 percent) in the Blue Mountains of eastern Oregon either depend on riparian zones or use them more than other habitats (Thomas 1979). It has generally been concluded that abundant moisture and an extensive three-dimensional structure are responsible for the well-documented high biological productivity of riparian habitats. Because of the proximity of surface drainage courses and the riparian vegetation, much of the high riparian productivity is often exported to downstream wetlands (see subsection 4.4.4 below). In addition, the variegated habitat structure apparently allows for a fine-grained subdivision of the habitat by wildlife species of virtually all taxa [see Kelly (1987) for a well-organized local study that documents the importance of riparian habitat for birds].

4.4.2 Sensitive Species in the Humboldt Bay Region

From an environmental resources planning perspective, one of the subjects that is normally addressed is the occurrence of "environmentally sensitive" species or their habitats. Environmentally sensitive species may be recognized in several ways, including appearing in the list of "element occurrences" maintained by the California Natural Diversity Data Base (CNDDB), an office in the Department of Fish and Game; occurrence in a separate list of "species of special concern" maintained by the Department of Fish and Game; appearance in one of the "lists" maintained by the California Native Plant Society (CNPS; plant species only); or appearance in the National Audubon Society's "watch list" (birds only).[15]

The CNDDB provides a listing of all "elements" that have been reported to the CDFG that occur in a specified geographical region (typically a USGS 7.5-minute quadrangle). These "elements" have an important status within environmental review processes conducted pursuant to the California Environmental Quality Act (CEQA). Elements can be species that are listed under one or more federal or state laws, species considered sensitive by non-profit organizations like the CNPS, or community types that are judged by the Department of Fish and Game or other entities to be environmentally sensitive. Current conventions in heritage assessments use a "nine-quad" search, in order to assure that all potentially sensitive elements will be identified with respect to physical impacts from proposed projects. Table 4-6 is the nine-quad search results for the Humboldt Bay region (centered on Woodley Island; it should be noted that two of the quads are "empty," with the quad locations falling in the Pacific Ocean).[16]

For planning purposes, this chapter identifies the element occurrences listed in Table 4-6 that are a concern for the Humboldt Bay Management Plan. It is, however, widely recognized that the CNDDB only includes records of element occurrences sent to

[15] *N. B.* It should be noted that the approaches described in this subsection are all examples of "natural heritage program" approaches to conservation planning. Heritage programs have certain inherent limitations for biodiversity planning. They are often focused on rarity and on small, mappable locations rather than large occurrence areas. This focus cannot adequately deal with elements that are not limited to small, mappable locations, such as habitat areas for large carnivores, or other elements that have large-area requirements or requirements for a mixture of habitats. As noted by Noss and Cooperrider (1994), such programs work through "successive approximations," which supposes that surveys are being conducted in various parts of the landscape over time, so that, eventually, the entire landscape will get adequate coverage.

An alternative to the heritage planning approach often advocated for extensive land areas is a "landscape ecology" conservation planning approach. Landscape ecology is concerned with the *spatial distribution of the ecological elements* that have conservation interest, as well as with the maintenance of *spatially based ecological processes* that support the elements of conservation interest. A consideration of the application of landscape ecology to conservation in the Humboldt Bay region is beyond the scope of this Plan.

[16] The results in Table 4-6 are derived from a software package, available from the Department of Fish & Game, called "RareFind3" (California Department of Fish and Game 2003).

It should be clearly understood that the CNDDB list of "sensitive" species cannot remain static for long, and that the entries in Table 4-6 are provided for illustrative purposes rather than as an attempt to list all of the "heritage species" that may be relevant for District consideration during the life of the Humboldt Bay Management Plan. Additional "sensitive" species will be considered in the CEQA documentation prepared to accompany this Plan.

the CNDDB; it is a common experience to discover that additional occurrences occur in a region that are not included in the CNDDB list for that region because these occurrences have not been reported to the CNDDB or for other reasons.

The majority of the elements in Table 4-6 do not occur in habitats that would be affected by the Humboldt Bay Management Plan. There are, however, several of species that could be affected by the District's management programs under this plan; the species most likely to be affected include great egret, great blue heron, snowy egret, black-crowned night heron, double-crested cormorant, osprey, Humboldt Bay owl's-clover, Point Reyes bird's-beak, tidewater goby, coastal cutthroat trout, coho salmon, chinook salmon, and steelhead.[17] In addition, other species in Table 4-6 occupy the Sphere of Interest, and virtually all of the species identified in Table 4-6 may be affected by collaborative management planning or actions that address the entire Humboldt Bay watershed. Because many of these species would be affected by one or more of the implementation elements identified in the Plan, both Plan-related and subsequent project-specific environmental reviews must consider potential effects on sensitive species.

Four of the five fish species identified in the previous paragraph are listed pursuant to the federal Endangered Species Act (ESA). Because these species could be affected by management activities in Humboldt Bay (such as dredging, mariculture operations, or certain kinds of recreational activities), the District will develop implementation measures for the Management Plan that include consultations with the relevant federal agencies.

Sensitive species, of which the species in Table 4-6 are examples, are considered environmentally sensitive in terms of environmental reviews carried out pursuant to CEQA. When the District considers projects pursuant to the Management Plan, a CEQA assessment will be carried out that considers potential effects on these species.[18]

4.4.3 Essential Fish Habitat

In 1996 the Magnuson Act, a law that provided for federal involvement in fishery management, was revised and readopted as the Magnuson-Stevens Fishery Conservation and Management Act (generally, the Magnuson-Stevens Act). One primary element added to the Act was the requirement that federal agencies consider the potential effects of proposed actions on "Essential Fish Habitat" (EFH).[19] The Act requires NOAA fisheries, in consultation with the Management Councils that oversee adopted Fishery Management Plans, to identify EFH for all species listed in each of the Management Plans. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." NOAA Fisheries and the management Councils are directed, for each Plan, to:

- Describe EFH and identify EFH in each fishery management plan,
- Minimize to the extent practicable the adverse effects of fishing on EFH, and
- Identify other actions to encourage the conservation and enhancement of EFH

Essentially, the EFH mandate in the Magnuson-Stevens Act requires that decision-making within Humboldt Bay consider the potential effects of Bay management on the "spawning, breeding, feeding, or growth" of any species listed in an adopted Fishery Management Plan. The species that occur in Humboldt Bay that are listed in a Fishery Management Plant are enumerated in Table 4-7.

The District has consulted with NOAA Fisheries regarding the EFH designation and management process that applies for Humboldt Bay. At the present time, EFH determinations are made by NOAA Fisheries on a project-by-project review basis; specific habitat designations have not been developed for habitats within Humboldt Bay.

[17] Chinook salmon (*O. tshawytscha*) and steelhead (*O. mykiss*) are not currently identified in the CNDDB as occurring in Humboldt Bay. However, these species/ESUs are present in Humboldt Bay and its tributaries (V. Frey, CDFG, pers. comm.).

[18] Prior to adopting this Management Plan the District will carry out a programmatic CEQA review for the Plan itself. That review will consider, in a programmatic manner, the potential effects of the Plan on these species.

[19] See URL: http://swr.nmfs.noaa.gov/efh.htm (viewed February 2007) for additional information about EFH.

Taxonomic Name	Common Name	Status [B] Federal/State/ CDFG/CNPS
Plants		
Abronia umbellata ssp. breviflora	Pink sand-verbena	--/--/--/1B
Astragalus pycnostachyus var. pycnostachyus	Coastal marsh milk-vetch	--/--/--/1B
Carex arcta	Northern clustered sedge	--/--/--/2
Carex leptalea	Flaccid sedge	--/--/--/2
Carex lyngbyei	Lyngbye's sedge	--/--/--/2
Carex praticola	Meadow sedge	--/--/--/2
Castilleja affinis ssp. litoralis	Oregon coast Indian paintbrush	--/--/--/2
Castilleja ambigua ssp. humboldtiensis	Humboldt Bay owl's-clover	--/--/--/1B
Cordylanthus maritimus ssp. palustris	Point Reyes bird's-beak	--/--/--/1B
Erysimum menziesii ssp. eurekense	Humboldt Bay wallflower	FE/CE/--/1B
Erythronium revolutum	Coast fawn lily	--/--/--/2
Fissidens pauperculus	Minute pocket-moss	--/--/--/1B
Gilia capitata ssp. pacifica	Pacific gilia	--/--/--/1B
Gilia millefoliata	Dark-eyed gilia	--/--/--/1B
Lathyrus japonicus	Sand pea	--/--/--/2
Lathyrus palustris	Marsh pea	--/--/--/2
Layia carnosa	Beach layia	FE/CE/--/1B
Lilium occidentale	Western lily	FE/CE/--/1B
Lycopodium clavatum	Running-pine	--/--/--/2
Mitella caulescens	Leafy-stemmed mitrewort	--/--/--/2
Monotropa uniflora	Indian-pipe	--/--/--/2
Montia howellii	Howell's montia	--/--/--/2
Puccinellia pumila	Dwarf alkali grass	--/--/--/2
Sidalcea malachroides	Maple-leaved checkerbloom	--/--/--/1B
Sidalcea malviflora ssp. patula	Siskiyou checkerbloom	--/--/--/1B
Sidalcea oregana ssp. eximia	Coast checkerbloom	--/--/--/1B
Spergularia canadensis var. occidentalis	Western sand-spurrey	--/--/--/2
Usnea longissima	Long-bearded lichen	--/--/--/--
Viola palustris	Marsh violet	--/--/--/2

Table 4-6. California Natural Diversity Database RareFind3 element occurrences in the nine-quad area surrounding the Eureka 7.5-Minute USGS quadrangle.[A]

A colorful array of marine life

Taxonomic Name	Common Name	Status [B] Federal/State/ CDFG/CNPS
Fish		
Eucyclogobius newberryi	Tidewater goby	FE/--/SC/--
Oncorhynchus clarki clarki	Coastal cutthroat trout	--/--/SC/--
Oncorhynchus kisutch	Coho salmon (SONCC ESU)	FT/CT/--/--
Reptiles and Amphibians		
Ascaphus truei	Tailed frog	--/--/SC/--
Emys (=Clemmys) marmorata marmorata	Northwestern pond turtle	--/--/SC/--
Rana aurora aurora	Northern red-legged frog	--/--/SC/--
Rhyacotriton variegatus	Southern torrent salamander	--/--/SC/--
Birds		
Ardea alba [C]	Great egret	--/--/SC/--
Ardea herodias [C]	Great Blue heron	--/--/SC/--
Charadrius alexandrinus nivosus	Western snowy plover	FE/--/SC/--
Egretta thula	Snowy egret	--/--/--/--
Nycticorax nycticorax	Black-crowned night heron	--/--/--/--
Mammals		
Arborimus albipes	White-footed vole	--/--/SC/--
Arborimus pomo	Red tree vole	--/--/SC/--
Martes americana humboldtensis	Humboldt marten	--/--/SC/--
Myotis evotis	Long-eared Myotis	--/--/--/--
Pandion haliaetus	Osprey	--/--/SC/--
Phalacrocorax auritus [C]	Double-crested cormorant	--/--/SC/--
Rallus longirostris obsoletus	California clapper rail	FE/CE/--/--
Uncommon Ecosystem Types		
	Coastal Terrace Prairie	
	Northern Coastal Salt Marsh	
	Northern Foredune Grassland	
	Sitka Spruce Forest	

Notes:

A The entries in Table 4-6 cover only seven quads; see text.

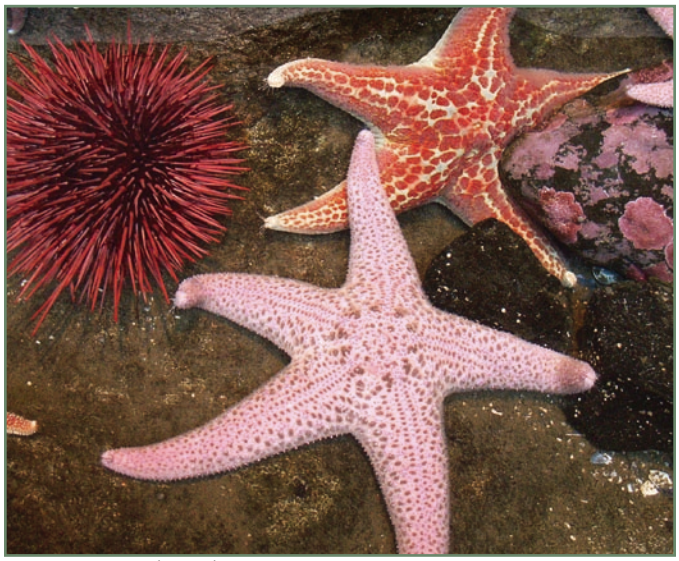
B
- FE "Endangered" under the federal Endangered Species Act.
- FT "Threatened" under the federal Endangered Species Act.
- CE "Endangered" under the California Endangered Species Act.
- CT "Threatened" under the California Endangered Species Act.
- SC "Special Concern" species for the California Department of Fish & Game under California law.
- 1B A species considered by the California Native Plant Society to be "Rare, Threatened, or Endangered in California and elsewhere."
- 2 A species considered by the California Native Plant Society to be "Rare, Threatened, or Endangered in California but more common elsewhere."

C These species are "Special Concern" species for rookery sites only (V. Frey, CDFG, pers. comm.).

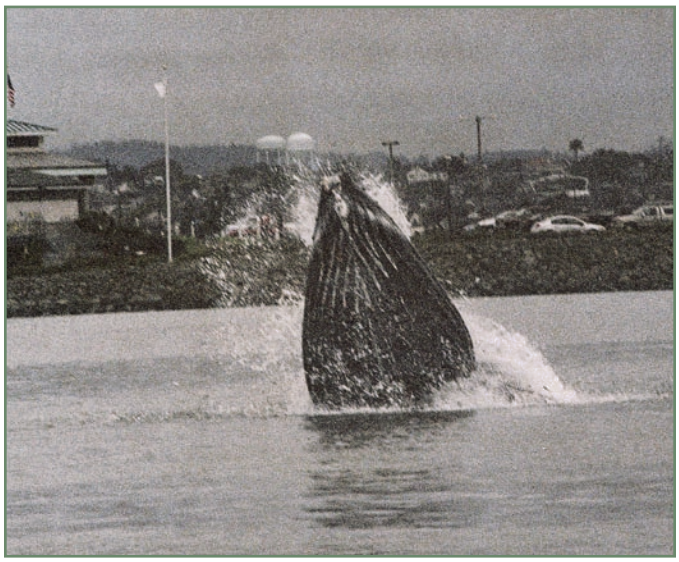
Table 4-6. California Natural Diversity Database RareFind3 element occurrences in the nine-quad area surrounding the Eureka 7.5-Minute USGS quadrangle.[A]

Black Brant

Nudibranch Dirona picta



Sea Stars and Urchin



A Humpback Whale provides an unusual sight in Humboldt Bay (Photo by Lynn Aspen)

4.4.4 An Ecosystem Perspective—Streams, Wetlands, and Humboldt Bay's Aquatic Biological Communities

The habitat conditions that occur in Humboldt Bay have been summarized in a variety of reports (Monroe 1973, Shapiro and Associates 1980, Proctor and others 1980, Barnhart and others 1992). The reports by Proctor and his colleagues and by Barnhart and his colleagues also consider the general ecological relationships that exist within the Bay. No additional depiction of Humboldt Bay ecosystem functions that is more apt than those in the cited reports has been created since the publication of the report by Barnhart and others.

In a general sense Humboldt Bay functions as do other terrestrial and aquatic ecosystems (Figure 4-3). The essential energy that powers the ecosystem is derived from the photosynthetic production of reduced carbon compounds.[20] Energy fixed by macroalgae, microalgae, phytoplankton, saltmarsh vegetation, and eelgrass (plus whatever enters the Bay in terrestrial runoff or from the Pacific Ocean) represents the "producer" trophic level; this energy sustains the entire trophic web. The sources of the fixed energy represent an essential component for understanding the Humboldt Bay ecosystem, and Barnhart and others (1992:53) provided approximate estimates of the magnitudes of the primary production (Table 4-8).

In a general sense, the basic productivity within Humboldt Bay is strongly dominated by the organic material produced by eelgrass beds and the algae and diatoms that grow on the Humboldt Bay mudflats. Nonetheless, as noted in Barnhart and others (1992:54) phytoplankton production may be more directly available to invertebrates in Humboldt Bay than is production from the other sources.

The primary production passes from the initial producers through a variety of trophic pathways,

[20] In the deep ocean some trophic webs are supported primarily on the basis of organic material that results from chemosynthetic production. This general pathway is not indicated in Figure 4-3, but could function analogously to a "decomposer" element. Such chemosynthetic pathways exist in Humboldt Bay, but their trophic web significance is unknown.

Taxonomic Name	Common Name
Coastal Pelagics Fishery Management Plan	
Engraulis mordax	Northern anchovy
Sardinops sagax caeruleus	Pacific sardine
Pacific Groundfish Fishery Management Plan	
Triakis semifasciata	Leopard shark
Galeorhinus zyopterus	Soupfin shark
Squalis acanthius	Spiny Dogfish
Raja binoculata	Big skate
Ophiodon elongatus	Lingcod
Scorpaenichthys marmoratus	Cabezon
Hexagrammos decagrammus	Kelp Greenling
Sebastes melanops	Black rockfish
Sebastes mystinus	Blue rockfish
Sebastes paucispinus	Bocaccio
Sebastes auriculatus	Brown rockfish
Sebastes caurinus	Copper rockfish
Sebastes rastrelliger	Grass rockfish
Sebastes miniatus	Vermillion rockfish
Sebastes flavidus	Yellowtail rockfish
Isopsetta isolepis	Butter sole
Microstomus pacificus	Dover sole
Parophrys vetulus	English sole
Citharichthys sordidus	Pacific sanddab
Psettichthys melanostictus	Sand sole
Platichthys stellatus	Starry flounder
Pacific Salmon Fishery Management	
Oncorhynchus kisutch	Coho salmon
Oncorhynchus tshawytscha	Chinook salmon

Table 4-7. Fish species in Humboldt Bay included in Essential Fish Habitat designations.

including species that consume plants or bacteria (the "*primary consumers*"), and species that consume other organisms that have consumed the plants (the "secondary consumers") or that consume the organisms that consumed the organisms that consumed the plants (the "*tertiary consumers*"). The "*decomposer*" pathway is typically a significant element in aquatic food webs; decomposers are organisms that consume organic material, known as "detritus," that drifts over, rests on, or is covered by bottom sediments.

Many of the fish or wildlife species that are a conservation concern for Humboldt Bay's management depend on the dynamic processes identified in Figure 4-3 for sustenance. Commercially and recreationally important fish and invertebrate species are mostly primary and secondary consumers. The commercially important but non-native Pacific oyster (*Crassostrea gigas*) is a filter-feeding organism that consumes whatever organic material, phytoplankton, and zooplankton that may drift by. Some waterfowl, including Pacific brant (Branta bernicla) and various species in the genus Anas (including pintail, wigeon, and teal), are primary consumers;[21] many other waterfowl species (such as those in the genus Aythya) are secondary consumers, feeding upon bottom-dwelling invertebrates; yet other waterfowl feed primarily on fish. Almost all shorebirds are secondary (or even tertiary) consumers of invertebrates, although some (such as the American avocet, Recurvirostra americana) apparently feed as much on mudflat algae as on invertebrates. In a very real sense, the "health" of the elements, and of the entire system, portrayed in Figure 4-3 is essential for

[21] Pacific brant are primary consumers that forage almost exclusively on eelgrass (*Z. marina*). Approximately 40 percent of the members of this species stop at Humboldt Bay during spring migration for forage on eelgrass, primarily but not exclusively in South Bay.

Source	Area (Hectares)	Annual Production (10^6 kg)
Salt marshes:		
Spartina dominated	223	2.790
Salicornia + *Distichlis* dominated	167	1.220
Mudflat microalgae and macroalgae	2878	9.066
Eelgrass beds (mostly *Zostera*)	1178	11.920
Phytoplankton	2205	3.000
Bay Total	*6651*	*27.996*

Table 4-8. Primary Production from Humboldt Bay Sources. (Source: Barnhart and others. 1992)

Sequoia Yacht Club 1890-1917

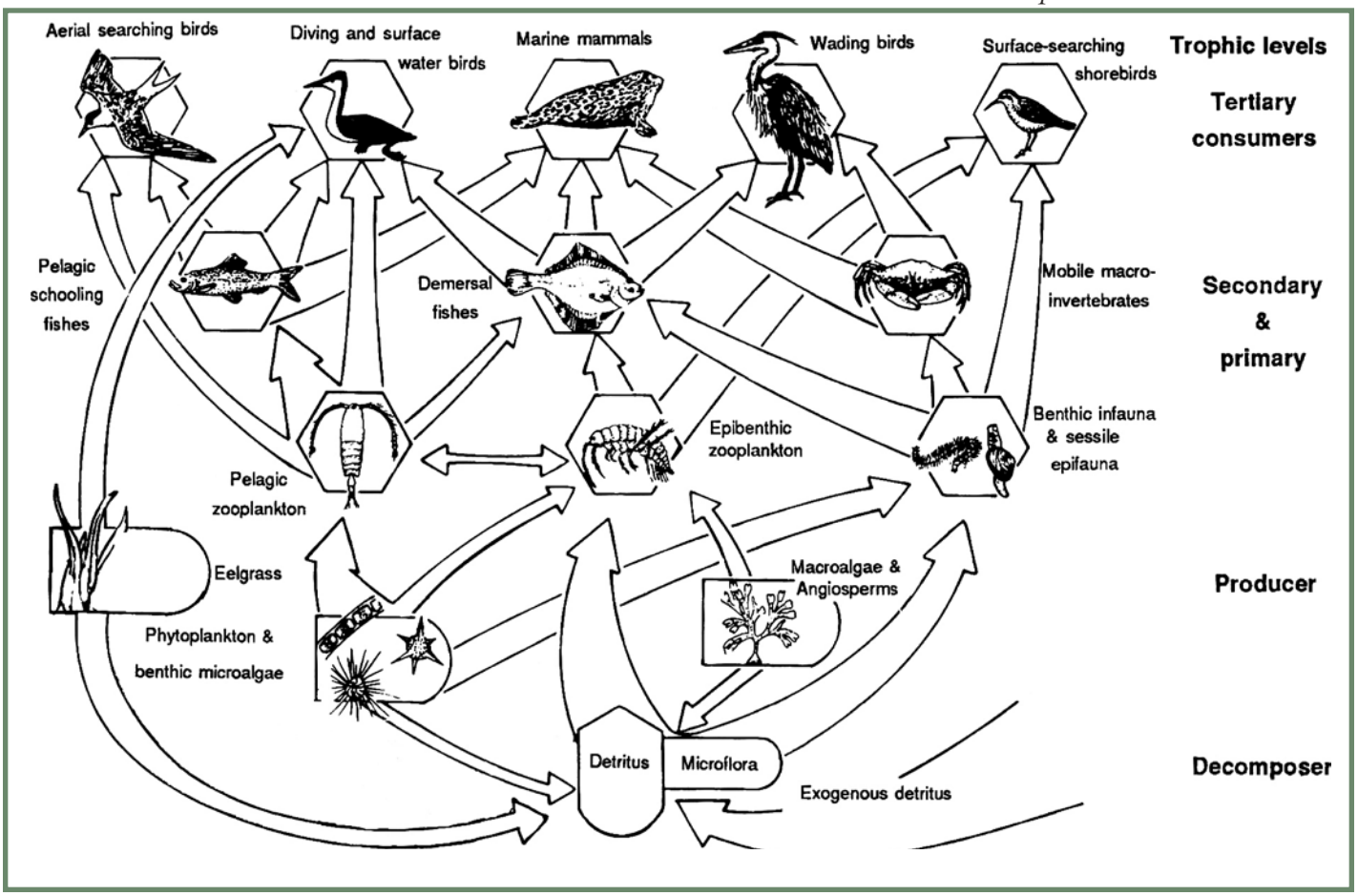


Figure 4-3. A generalized food web for Humboldt Bay; the sizes of linkage arrows indicate the relative biomass transfer through that linkage. (Source: Barnhart and others. 1992)

the continued functioning of a productive Humboldt Bay ecosystem.

Notwithstanding their importance, the great majority of the ecosystem processes summarized in Figure 4-3 are not well understood for Humboldt Bay. The schematic diagram in Figure 4-3 represents a conceptual view of the ecological food web in the Bay, excerpted from Barnhart and others (1992:61). Those authors include the following statement regarding this figure:

"The fauna and flora of Humboldt Bay are integrally linked through trophic and other ecological relations. However, no quantitative data on the carbon or energy flow through the food web are available. Figure (4-3) is an adaptation of a generalized food web for estuarine channels of the Pacific Northwest coast (reference omitted); with the addition of an eelgrass component, this food web is a probable representation of the general trophic relations in Humboldt Bay."

This statement remains a valid general summary of expected trophic webs within the waters of Humboldt Bay. However, the diagram in Figure 4-3, the summary paragraph above, and the Table 4-8 also substantially under-represent the complexity in the food webs in the larger Humboldt Bay ecosystem. As noted in Barnhart and others (1992:52-55), the importance of detrital organic material in the Bay ecosystem is substantial; it is likely that much of the gross primary production is not directly usable by organisms in Humboldt Bay (particularly invertebrates) until it has passed into the "detritus" compartment, and it is also certainly possible that a substantial fraction of the Bay ecosystem's gross primary production is lost from the Bay to the nearshore Pacific.

The above summary is also inadequate in another respect, because it also omits the importance of production imported into the Bay ecosystem from the uplands surrounding the Bay, particularly from riparian areas (some of which are wetlands, and are thus part of the aquatic ecosystem complex in the Bay area). Organic matter also enters the Bay that results from production in the aquatic ecosystem elements in the diked former tidelands and the streams themselves. Riparian forests dominated by deciduous species may yield a gross primary production per unit area that is as high as any of the production sources in Table 4-8 (Mitsch and Gosselink 2000:556). Primary production from the diked former tidelands is likely lower per unit area, approximately equivalent to the productivity of saltmarshes (see, e.g., Kantrud and others 1989:Table 10).

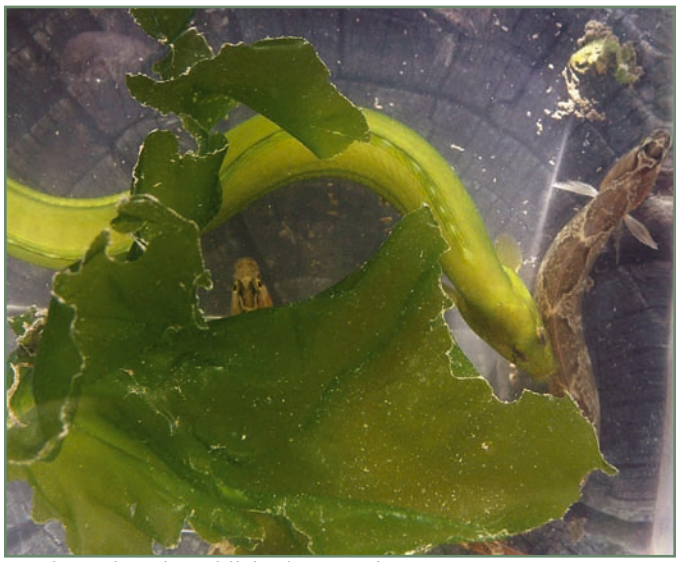
These highly productive wetland and riparian areas exist in abundance in the Bay's watershed, and their contributions to the ecosystem productivity in the Bay are undoubtedly substantial. However, because the ecological productivities and other characteristics of the streams, riparian areas, and seasonal wetlands near Humboldt Bay have not been adequately studied, the relative contributions that these areas make to the Bay's ecology are uncertain.

The Humboldt Bay ecosystem must be understood as incorporating the elements in the entire watershed, because the physical and biological processes within the Bay simply do not stop at the Bay's margin. Recent concerns about the life cycle dynamics of anadromous fish in the basin, particularly coho (see below), indicate a need to consider the streams in which coho spawn and rear, as well as the Bay itself. Also, research on the uses of Humboldt Bay by shorebirds has confirmed the long-held belief that the seasonal wetlands behind the levees (i.e., the diked former tidelands) play a significant role in the ecology of these species (e.g., Colwell and Dodd 1997), and the designation of Humboldt Bay as a site in the Western Hemisphere Shorebird Reserve Network lists all of the wetlands in the Humboldt Bay "complex" (i.e., the Bay, the diked former tidelands, and aquatic elements in the Mad River and Eel River estuaries) as elements.

Clearly the conservation concerns for this Plan (and for the plans of other agencies in the region) cannot address only the management of the Bay's waters; management plans and policies must consider the entire ecosystem complex, including the effects of activities occurring in uplands. It is evident that additional knowledge about these ecosystem elements

Resident deer on Woodley Island

Red-tailed Hawk



Rockweed and Saddleback gunnels

and processes is required for characterizing the full range of Humboldt Bay's dynamics and identifying the functions that are provided by various component elements in the wetland complex.

Addressing this inadequacy clearly must be an element in the Management Plan, although many of the elements that must be addressed are not within the District's direct jurisdiction. The policies in Chapter 4.0 of Section III include direction for the District to participate in (among other things): (1) initiating studies of sediment dynamics and developing sediment-control plans on a watershed basis; (2) developing collaborative watershed-based approaches for reducing and offsetting point-source and nonpoint-source (NPS) pollutant loadings to Humboldt Bay; (3) identifying watershed-based wetland management, restoration, and enhancement opportunities; and (4) identifying important dynamics in the uses of aquatic habitats by fish and other wildlife in the watershed. These elements include only a sampling of the important interagency, inter-jurisdictional technical issues that must be addressed, across boundaries, in order to fully comprehend and manage aquatic ecosystem elements in the Humboldt Bay watershed.

4.5 Management-Related Issues and Concerns

The use of Humboldt Bay by humans is associated with real or potential effects on a variety of conservation resources. Fishing is a practice that involves the harvesting or taking of individual members of wild species, and the effects of fishing on the populations of these species can be substantial. Commercial shipping may affect the Bay's ecology through the physical and biological effects of dredging on invertebrate populations, through the potential effects of introduced species on the Bay's ecological patterns, or as a consequence of spills. Aquaculture (perhaps more appropriately termed mariculture) may affect the physical habitat conditions needed for other species, and the ecological effects of the organisms may change the dynamics of the Bay's biological communities. Even recreational activities may affect individuals or whole populations of species in the Bay.

The Management Plan adopted by the District will not explicitly address the "direct hands-on management" of these activities or these conservation resources. Instead, the focus of the District's management will be on a set of "programmatic elements" for managing Humboldt Bay. This management approach stems, in part, from the District's awareness that existing knowledge about Humboldt Bay is less-than-perfect. That is, in order to develop effective long-term management programs for the conservation resources in the Bay, there needs to be a better base of knowledge about some of the environmental resources; there also needs to be a better understanding of the relationship between human uses in the Bay and the species and habitats that constitute these environmental resources.

This subsection briefly identifies and describes a number of substantive conservation issues that must be addressed in the Bay's management program. The descriptions below indicate the District's general understanding of each issue, as well as indicating the general direction that the District will take in developing more focused management approaches for these issues (see Section III for the policy framework leading to District management programs).

4.5.1 Basin-wide Wetland Restoration or Enhancement

The policies in Section III direct the District to participate fully in the planning process for wetland restoration in the Humboldt Bay watershed. The restoration process has two interrelated elements.

4.5.1.1 Intertidal Restoration

As noted previously, as much as 40 percent of the intertidal area of Humboldt Bay (about 11,000 acres out of the approximately 27,000 acres present in 1850) was separated from tidal action by the beginning of the 20th Century. Most of this "diked former tideland" was subsequently devoted to agricultural purposes. Substantial interest exists among citizens, some local agencies in the Humboldt Bay region, and some state and federal agencies about the potential for restoring or enhancing aquatic habitats in the Humboldt Bay area to conditions that more nearly resemble the conditions present a century ago.

Several wetland restoration and enhancement projects have already been completed in the diked former tidelands near Humboldt Bay, including the 557-acre Mad River Slough Wildlife Area (CDFG), the 484-acre Fay Slough Wildlife Area (CDFG), the 104-acre Elk River Wildlife Area (CDFG), and approximately 2,200 acres in the Humboldt Bay National Wildlife Refuge Complex (U. S. Fish and Wildlife Service). These substantial areas represent wetland enhancements, for the most part, in that the management focus is primarily the use of rainfall to enhance wetland conditions within the existing levees.

The interest in additional restoration projects includes an increased focus on intertidal restoration, or (equivalently) the restoration of tidewater access to diked former tidelands. At least three major projects were under discussion at the beginning of 2005, including the restoration of tidal action to diked former tidelands near McDaniel Slough (jointly a project of the City of Arcata and the Department of Fish and Game), a possible restoration of tidal action to the Jacoby Creek/ Gannon Slough area north of Jacoby Creek (City of Arcata), and a possible restoration of tidal action near the lower end of Martin Slough, in the Elk River basin (a project suggested by the Redwood Community Action Agency but currently lacking an agency sponsor). Collectively these projects would increase the Bay's tidal area by nearly 1,000 acres (because the projects are conceptual, restored areas are conjectural).

This Plan accommodates the possible restoration or enhancement of wetland areas in the Bay's watershed. For the most part the restoration and enhancement proposals occur within the Sphere of Interest, and would likely not directly affect the lands within the Plan Boundary. The District would expect to participate in the Bay-region planning process for the restoration, for two reasons:

- Changing the tidal dynamics in Humboldt Bay, a consequence of restoring some currently diked areas to tidal action, has a potential for changing the hydrological dynamics in the Bay, including the tidal flood-flow and ebb-flow patterns and the sedimentation and scour patterns in the Bay.

Sediment and hydrological dynamics within the Plan Boundary are a significant concern for Bay management, and District concerns over these subjects require District participation in the planning work for restoring tidal access to diked former tidelands.

- The legislation creating the District granted to the District the regulatory control over the tidelands in Humboldt Bay to the elevation of mean higher high water. The diked former tidelands are not currently the District's responsibility. A restoration to tidal action, such as through levee breaching and exposure to tidal flow, most likely would restore the District's jurisdiction over these then-unleveed tidelands, to the elevation of mean higher high water.

4.5.1.2 Marsh Restoration

As noted in the following subsection, marshes in the Humboldt Bay basin have been degraded through the presence and the activities of exotic species. The most important exotic species is undoubtedly dense-flowered cordgrass (*S. densiflora*), which has come to dominate many of the remnant areas of saltmarsh in Humboldt Bay.

As part of the restoration planning discussion for the Bay, the potential for restoring marshlands in Humboldt Bay to an approximation of pre-settlement conditions must play a role. For example, one significant reason for restoring diked former tidelands to intertidal status would be to allow for the re-establishment of saltmarsh; the restoration of saltmarsh might be paired with a control program for dense-flowered cordgrass and other exotic species, with the goal of restoring substantial areas of saltmarshes that resembled the marshes present prior to the historical conversion.

The District will generally support restoration programs for native marshland species, as well as the maintenance (or a restoration) of general ecological conditions that would support marshes dominated by native species. Such marshes could be more resistant to effects deriving from storms or other adverse natural events, or quicker to recover, than marshes with many exotic species affecting them. Natural marsh communities may better support the native ecological communities that are still present in Humboldt Bay.

4.5.2 Exotic Species

The effect of exotic (better described as "nonindigenous") species on ecosystem functions is a substantive environmental concern throughout the world. Nonindigenous species may have a variety of potential adverse impacts, including:

- Direct physical impacts on human infrastructure, such as boring into and weakening wooden pilings or clogging water intake pipelines.
- Adversely affecting the productivity of biological populations directly used by humans, such as the effects of non-native parasites or predators on fish or shellfish.
- Reducing the capability of natural populations or ecosystems to resist stress-related changes in composition or structure, such as a loss of native plant species because of the effects of non-native plant species invading the natural communities.

The introduction of nonindigenous species into estuaries such as Humboldt Bay is the subject of a Presidential Executive Order (EO 13112), issued in 1999. Nonindigenous species are also the subject of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, last amended in 2000. Both the EO and the legislative act direct federal agencies to avoid or prevent the introduction of nonindigenous aquatic species into American waters. The primary focus in the case of these federal agency programs is the potential delivery of harmful or nuisance species in ballast waters. The release of exotic organisms into California waters is also regulated under state law (e.g., Fish and Game Code section 6950). Nonetheless, introductions of additional nonindigenous species still occur in major California ports (see, e.g., Cohen 1998).

Humboldt Bay, as a natural estuarine ecosystem, appears to be less-affected by non-indigenous species than are many other bodies of water that are commonly exposed to shipping, primarily as a consequence of historically lower levels of shipping in

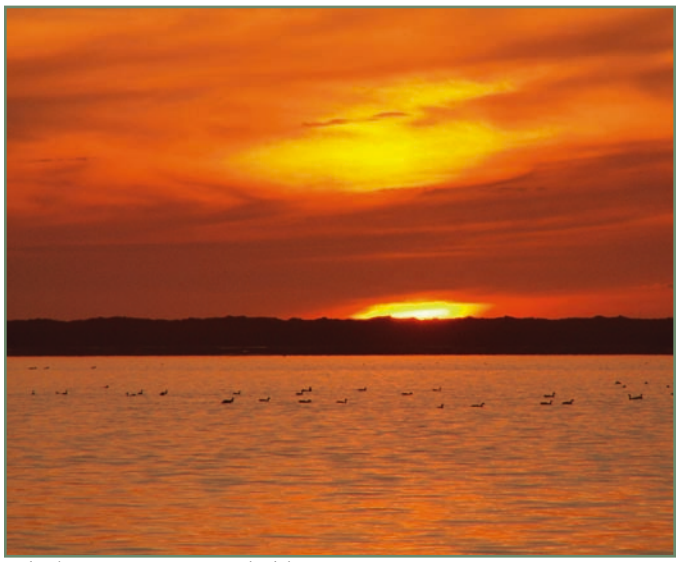
Humboldt Bay. However, there appear to be at least 95 species of organisms, in a variety of taxonomic groups, in Humboldt Bay that most likely did not evolve there (Boyd and others 2002). Some of these species appear to have been present in Humboldt Bay for a considerable period of time, and to have already resulted in substantial alterations in the native ecosystems in the Bay (e.g., dense-flowered cordgrass). Other nonindigenous species have been introduced intentionally (e.g., the commercially grown oyster in Humboldt Bay, *Crassostrea gigas*).

The District has been cognizant of the threat represented by nonindigenous species for more than a decade, and addressed the potential effects of nonindigenous organisms on Humboldt Bay for the first time in adopting Resolution 96-9, in 1996. As part of the development of the Management Plan, the District will re-examine the potential need for proactive management of ballast water in commercial vessel traffic, working in collaboration with relevant state and federal agencies (particularly the Department of Fish and Game and the U. S. Coast Guard).

The District also will work collaboratively with local, state, and federal agencies concerning the potential for controlling or reducing exotic species in Humboldt Bay. The possible control of dense-flowered cordgrass as an element in saltmarsh restoration was identified previously, and it is possible that some activities that occur within the Sphere of Interest or elsewhere within the larger Plan Boundary could affect the spread of this species. The District continues to cooperate with the Department of Fish and Game in efforts to eradicate the non-native Japanese eelgrass (*Zostera japonica*) on the western shore of Indian Island. The District previously supported the efforts of the Department of Fish and Game to eradicate a small established population of eastern or smooth cordgrass (Spartina alterniflora) in Arcata Bay. The District supports the eradication of common reed (*Phragmites australis*) from Humboldt Bay. The District will consider the role that it should take in managing other nonindigenous plant species as it develops implementation measures for the Management Plan.

A Great Egret takes flight over Arcata Marsh
(Photo by Solon Holstein)

Black Rockfish



Black Brant on Humboldt Bay

4.5.3 Fishing and Aquaculture

4.5.3.1 Fishing

The relationships among the ecological resources in Humboldt Bay that support a variety of fish and invertebrate species that are important for human uses and natural ecosystem dynamics are not well characterized. The relationships among various human uses of the Bay and potential effects on these ecological resources are also generally not well understood. Some activities that are generally considered desirable for the Humboldt Bay Management Plan by various members of the public may be associated with ecological or populational stresses on environmental resources, including fish species.

A number of the fish and invertebrate species known to occur in Humboldt Bay (see Barnhart and others 1992) are commercially valuable species, and the requirements of the Magnuson-Stevens Act (described above in subsection 4.3.3) to identify and manage EFH for many of the fish species increases the management-informational requirements for the District's planning process. These requirements receive added importance owing to the recent historical changes in the economic viability of commercial and sport fishing as economic activities in northern California. Humboldt Bay is believed to play an important role in sustaining populations of the fish and invertebrate species that support these industries.

At the present time the ecological patterns demonstrated by these commercially and recreationally important fish and invertebrate species in Humboldt Bay are generally not well understood. Recent research carried out by faculty scientists from Humboldt State University, by scientists from the University of California, and by federal agency scientists have demonstrated fish-species ecological use patterns that were not fully anticipated. The current studies have not, however, provided sufficient information to allow a characterization of the overall patterns of use by commercial species (or use patterns for most other species, for that matter) in Humboldt Bay.

In order to manage the Bay's conservation resources, the District expects that additional research and scientific synthesis will be needed regarding the ecological patterns that support the plant, invertebrate, fish, bird, and other species in the Bay. The development of additional knowledge about the Bay's ecosystems and the various species and species groups is not directly the District's responsibility; the District does not anticipate directly carrying out or funding basic or applied research regarding the Bay's ecosystems. However, the District acknowledges the need for substantial scientific knowledge about the Bay in order to meet its obligations for conserving the Bay's environmental resources.

This Plan is based upon an understanding that the District should monitor research and integrated scientific thinking about the Bay and its resources. The nature and extent of the information needed for decision-making should be communicated to academic institutions; to local, state and federal agencies; and to members of the public. Where needs for specific information related to management issues can be identified, the District anticipates assisting in the development of applied research opportunities within the Bay; when appropriate, funding for the necessary work may be developed, in part, through the District's permit review and approval processes.

The District anticipates collaboration with other regulatory agencies having responsibility for Humboldt Bay, in order to develop a coherent approach for identifying and filling management information needs. The policy framework in Section III identifies an approach to information management that incorporates the needs of the District with the needs of other agencies with approval authority for activities on the Bay, including the Department of Fish and Game, the Coastal Commission, the U. S. Army Corps of Engineers, and other state and federal agencies involved in Bay management.

4.5.3.2 Aquaculture

Humboldt Bay has a history of aquaculture uses, and there is apparent interest in the potential for additional aquaculture development. The nature of aquaculture

as it is practiced now differs substantially from many past practices, and the changes in practices have resulted, in large part, from the District's management of Bay tidelands.

The essential issue raised with respect to aquaculture is that the use of Bay tidelands for aquaculture is associated with effects on other environmental resources in the tidelands. For example, one current version of oyster mariculture in Arcata Bay is conducted in a subset of the locations and elevation ranges that are occupied by eelgrass (*Zostera marina*), an intertidal aquatic grass that is known to be associated with or provide for the ecological needs of many other species (see the following subsection). It is possible that oyster mariculture may be unable to avoid creating adverse effects on eelgrass, notwithstanding the fact that oyster mariculture is a legally acceptable Public Trust use of the Bay's tidelands; the Bay management issue that results from this is whether there is, or should be, a set of practices that maintains both the economic benefits of mariculture and most of the ecological benefits of eelgrass.

The subject of regulating maricultural uses in Humboldt Bay also includes questions about regulating several relatively small existing mariculture operations in public tidelands, as well as larger questions about the desirability and the conditions that might be required should larger, shore-based aquaculture proposals be advanced for the Bay. There is little question that maricultural uses are one of the categories of legitimate uses of public tidelands that the District must consider. The management "issue" for the District, for which the Management Plan and its implementation programs must provide guidance, is the appropriate balancing of this legitimate use with others.

The District has, in the past half-decade, developed substantial information and management knowledge about some maricultural uses and activities in the Bay's tidelands. Additional information needs may be developed in the future. As noted in the previous subsection under fisheries management questions, the District anticipates a need for collaborations with a variety of other agencies in order to review and manage proposed maricultural operations in ways that minimize adverse effects on the environment while providing information needed by the District and other regulatory and trustee agencies.

4.5.4 Sensitive Species and Sensitive Habitats

The management of Humboldt Bay as an essential habitat element for some sensitive species is an important consideration for the implementation of the Management Plan. The single most significant concern in this respect is species listed under the federal or the state Endangered Species Act (discussed above in subsection 4.4.2). Of these species, the potential to directly affect management programs in Humboldt Bay is well illustrated by a species also considered pursuant to the Magnuson-Stevens Act: coho salmon (*Oncorhynchus kisutch*). The considerations surrounding coho and its habitats illustrate a complexity in Bay management that the District considers will also arise for other species during the life of the Management Plan.

Coho are anadromous, spawning in coastal California rivers, rearing for the better part of a year in freshwater streams and rivers or estuarine waters, and then migrating to the Pacific to grow to adulthood before returning to freshwater rivers to spawn and die. Coho are a known spawning species from several of the larger streams that enter Humboldt Bay (e.g., Jacoby Creek, Freshwater Creek, Elk River, and Salmon Creek).

At the present time the life history of coho in the Humboldt Bay watershed is not fully worked out. In particular, the locations at which rearing occurs are not well known (rearing is the period following spawning in which the fish remain in rivers or estuarine waters, before they undertake the physiological changes that accompany entering saltwater). One of the potentially important rearing areas for coho, based on research carried out in estuaries farther north along the Pacific coast, is considered to be eelgrass (*Z. marina*) meadows in the estuarine environment, although no research from Humboldt Bay has produced results that are consistent with that view.

Eelgrass is considered to be an environmentally significant habitat type, in addition, because of key relationships it plays in estuarine ecosystems generally (see, e.g., Phillips 1984). As noted elsewhere in this chapter, eelgrass occurs in parts of Humboldt Bay that may be affected by a number of potential actions that are considered compatible with public trust uses of California's tidelands.

The relationships among uses of Humboldt Bay that may internally conflict because of potential resources conflicts over sensitive species or sensitive habitat types represent a significant management challenge for the Humboldt Bay Management Plan and for the District's management of Humboldt Bay. The specific solutions for the inherent management conflicts represented by these circumstances cannot be specified in Plan policies, although the Plan policies in Section III establish the framework in which the District, in collaboration with the relevant federal, state, and local agencies and with other Humboldt Bay users, will work out specific solutions that protect the important species and the habitats while allowing other uses to occur that are compatible with the District's Public Trust-based conservation obligations.

4.5.5 Potential Long-term Physical Concerns

This chapter has identified a District concern for the effects of sedimentation in Humboldt Bay, owing to the potential impacts of the sediment on navigation and on other trust concerns. The District and other agencies (principally the federal government) periodically spend substantial sums of public funds to dredge the entrance and the channels in Humboldt Bay in order to maintain the Bay's potential for commercial vessel traffic. The relationships among land uses in the Humboldt Bay watershed and the potential for sediment mobilization were summarized above,[22] and form a nexus for District concerns about land uses practices in the basin.

This concern represents an example of a long-term physical effect on Humboldt Bay, of a kind that is germane for the District's Management Plan. The District lacks direct authority for land use regulation, however; the options that are available to the District to influence land uses in ways that could reduce sedimentation are those that result from consultation and collaboration with the local agencies that regulate land use, in addition to contact and collaboration with agencies such as the Coastal Commission and the Regional Water Quality Control Board that exercise oversight authority under state law, and potentially with appropriate federal agencies with oversight authority under relevant federal law. The policies in Section III therefore direct the District to carry out this liaison.

There are other physical trends that may affect Bay management that are not within the jurisdiction of any local agency. Some of the trends are within the existing regulatory purview of state or federal agencies; other potential management concerns (such as the introduction of invasive plant species for landscaping purposes) are not currently a management concern for any state and federal agencies.

Of the physical trends that the District will consider in implementing the Management Plan is the gradual increase in sea level, which has increased by approximately 22 centimeters (approximately nine inches) in San Francisco in the past century, while the higher tidal elevations have actually increased even more with respect to conditions in 1900 (Flick and others 2003). Because shoreline protection is a management concern for the District, the potential need for reviewing and approving proposals to rebuild levees and armor shorelines that are under attack because of wave action accompanied by a higher sea level stand has become an issue of concern for the District.

[22] As noted above, the vast majority of the sediment that enters Humboldt Bay appears to be carried into the Bay on incoming tides, having originated from the Mad River and Eel River basins.

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Eureka whaling station, circa 1940

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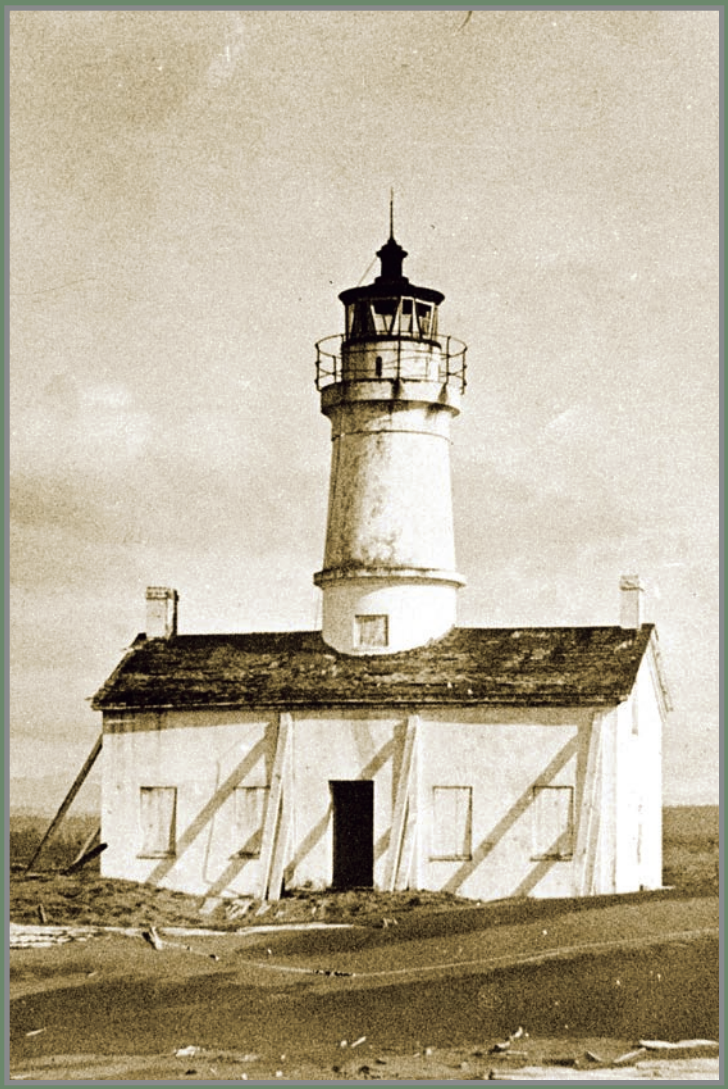


Section III

Policy Document

Humboldt Bay Management Plan

May 2007


A. W. Ericson.

Chapter 1.0

Introduction

Section III of the Humboldt Bay Management Plan presents the policy framework that the District has adopted in order to carry out its obligations for Bay management, as described in Section I and amplified in Section II. The policy framework is presented in three chapters, one each for Harbor-related management (Chapter 3.0), Recreation management (Chapter 4.0), and Conservation management (Chapter 5.0).

Prior to describing the policies, this Section presents (in Chapter 2.0) a proposed water use designation program for Humboldt Bay. The designations identify large regions in the Bay in which certain categories of uses (described in Chapter 2.0) will generally be considered by the District to be compatible with the management directions presented in this Plan. The District proposes to adopt this general approach in order to describe in broad visual terms to applicants, other agencies, and members of the public the generalized distribution of Bay uses contemplated in this Management Plan.

It should also be noted, as described generally in Chapter 2.0, that there are many uses of Humboldt Bay that will not likely come under the jurisdiction of the District, including individual use of the Bay for navigation or recreational purposes, and use of the Bay's waters for transportation or shipping, among many other uses.

The policy framework laid out in this Section establishes clear management directions for harbor-related uses, recreation, and conservation management, thus addressing the District's legislatively established concerns. The policy framework describes what the District is interested in managing or regulating, what kinds of activities it may approve, and under which circumstances. The Plan provides guidance to the District, to other agencies, and to members of the public about the District's decision-making processes for Bay Management.

The heart of this policy document may best be described, however, by the concept that no policy is more important than other policies, and no use is more important than other uses. Managing the Bay requires a balancing of priorities, and the policy framework

Olive shell

Surfing Humboldt Bay entrance

Coast Guard buoy tender Aspen

provides that balance. Therefore, in implementing this Plan the District will consider **all** of the policies, and the District will make and adopt findings that relate the requirements of this policy document to the decisions that the Board of Commissioners makes in carrying out this Plan.

Chapter 6.0 of this Section provides a brief consideration of several possible "implementation scenarios" for the Plan's policy framework. All of the scenarios include substantial roles for the people who live on and use Humboldt Bay, or who assist in regulating the natural and environmental resources in the Bay. The alternative implementation approaches all require the full involvement of the District's decision-makers and staff, as well as the active involvement of applicants for District approvals, staff and decision-makers from other agencies, and the public. The involvement of this wide array of interested parties will also help the District in determining the potential need for Plan amendment, which would occur following similar involvements in a period that is long enough to determine the real need for such amendments. See Chapter 6.0 for additional information.

U.S. Army Corps of Engineers dredge Essayons

Humboldt Bay Water Use Designations

Chapter 2.0

In implementing the Humboldt Bay Management Plan the District will apply new water use designations to Humboldt Bay; general descriptions of the new designations are presented below. In implementing this Plan, the District will use these water use designations in combination with the policies identified in other parts of this plan to guide its management activities in Humboldt Bay.

The water use designations and policy framework are intended to be used together to implement the District's management functions in the areas of harbor development, promotion, and maintenance; creation and improvement of recreational facilities and opportunities; and enhancement and conservation of natural and environmental resources. As with the policies, the water use designations are intended to be applied to matters only within the jurisdiction of the District; they are intended to be compatible with the responsibilities and interests of other local, state, and federal agencies.

The Management Plan water use designations consist of two primary use designations and two "overlay" or "combining" designations, as shown in Figure 2-1. The primary designation areas, which are similar to those in the Koebig and Koebig (1974) Harbor Master Plan, are (1) ***Harbor*** and (2) ***Bay Conservation***. The two combining designations, which overlay portions of the areas covered by the primary designations, are (1) ***Marine Recreation*** and (2) ***Mariculture***; the additional purposes and prescriptions of the combining designation areas are meant to supplement those of the underlying primary areas, as explained below.

Both the primary and combining areas identify geographical areas of the Bay where certain uses will generally be treated preferentially by the District, in accordance with this Plan. The designations are meant to assist in guiding the discretionary uses of Humboldt Bay in ways that promote public safety and welfare, protect the environment, stimulate commerce and desired economic activities, and fulfill other aspects of the District's public trust responsibilities. Consistency with the water use designations will be considered by the District as a positive indication of general

Tall ship Lady Washington

Woodley Island Marina

Pacific Oysters on longlines in Arcata Bay

consistency with the requirements in this Management Plan.

In general, many uses of the water areas within Humboldt Bay are allowed in each designated area without specific authorization. Navigational uses, fish and wildlife habitat management or scientific study that does not involve direct environmental modification, and similar activities do not require District approval (see following subsection). Other uses may be authorized by the District through the District's permit process (Ordinance 14), which will also include environmental reviews pursuant to the California Environmental Quality Act.[1]

2.1 Activities Not Subject to District Review

The District's jurisdiction extends to "development" activities (or "projects," in the sense that this term is used in the California Coastal Act). Many uses of Humboldt Bay's waters do not constitute "projects" or "development," and are not subject to District jurisdiction. Examples of these uses include:

- Nature study and other educational/scientific uses that do not include environmental manipulation
- Maintenance or protection of existing environmental and natural resources, including fish and wildlife habitat, that does not include environmental manipulation
- Navigation on the waters of Humboldt Bay
- Commercial shipping activities at existing port facilities
- Individual recreational activities (including fishing, hunting, windsurfing, birding, and similar activities) that do not include or involve physical structures or organized group activities

This category of uses is generally broad, and includes many uses that are normally associated with navigable coastal waters. The District does not intend to assume regulatory authority over traditional activities that are properly outside the scope of the Management Plan; however, if an actual or potential use or activity includes a manipulation, development, or alteration in Humboldt Bay's natural or built environment, then the policies in this Plan apply. In addition, in some cases "traditional" uses may now cross a threshold of management concern for the District, and potential users of the Bay's resources should assure themselves of the District's policies prior to undertaking actions that might affect the Bay's resources.

2.2 Primary Water Use District Designations

The Humboldt Bay Management Plan provides a framework for the Bay's management, within which the District must make both strategic and day-to-day decisions regarding ordinary uses of the Bay, ongoing District management activities, and activities that may be proposed by a variety of other people or agencies with interests in Humboldt Bay. The water use designations identified in this chapter, in combination with the policies identified elsewhere in this Section, provide a framework for that decision-making process.

When applying the use designations in this chapter to the Bay's management, the District's staff and decision-makers will consider the complete policy framework identified in this Section of the Plan. Thus, even a use that is found to be consistent, or compatible, with an identified use designation will still be required to meet or comply with all of the policy directions identified in this Plan.

The activities described in each of the following Plan subsections are only examples of the kinds of specific uses that may occur under the use designations. The District will develop, following further deliberation by the Board of Commissioners, and with public involvement, additional clarification regarding the kinds of activities that are compatible with each use category, and this Plan Section may be amended in the future to reflect those decisions.

[1] It should be noted that other agencies with jurisdiction over some aspects of Humboldt Bay, such as the Department of Fish and Game, the Regional Water Quality Control Board, or the U. S. Coast Guard, may retain requirements for approvals for activities that the District will not regulate.

Figure 2-1: Humboldt Bay Water Use Designations

2.2.1 Harbor

(A) **Purpose**. The ***Harbor*** use designation is included in the Humboldt Bay water use classification in order to maintain port-related or harbor-related waters adjacent to upland areas (under the land use jurisdiction of the County of Humboldt and the City of Eureka) that are reserved or designated for coastal-dependent or water-dependent uses in the adopted land use plans of those agencies (see Figure 2-1 in Chapter 2.0 of Section II).

The ***Harbor*** water use designation thus supports "upland" land uses that require waterfront locations, consistent with policies in this Plan as well as those in the Coastal Act and the federal Clean Water Act.

The District will exercise a "preference" for port-related or harbor-related activities in the area covered by this use designation. That is, the District will preferentially consider proposed uses or activities within the area covered by this designation in terms of their potential desirability for port-related or harbor-related functions in Humboldt Bay, or (alternatively) in terms of their consequences for such uses.

(B) **Uses Authorized Within This Designation**. The following uses are examples of the kinds of uses that are expected to occur within the ***Harbor*** use designation upon the issuance of a Use Permit from the District:

(1) Maintenance dredging of turning basins, berthing and mooring areas, and boat launch ramps
(2) Dredging of new or deepened channels
(3) Restoration and maintenance dredging of previously dredged navigation channels
(4) Incidental public works projects, including but not limited to, burying cables and pipes, or maintenance of existing intake and outfall lines
(5) Piers, docks, and wharves
(6) Shoreline protection projects
(7) Port, energy, and coastal-development industrial facilities
(8) Boating and marina facilities
(9) Commercial fishing facilities
(10) Boat repair and shipbuilding
(11) Marine oil/fuel terminals
(12) Oil and gas pipelines
(13) Outer Continental Shelf (OCS) service bases and offshore pipelines
(14) Seafood processing facilities
(15) Water-borne carrier import and export facilities
(16) Other port-related project types not specifically identified above

2.2.2 Bay Conservation

(A) **Purpose**. The ***Bay Conservation*** use designation is included in the Humboldt Bay water use classification in order to foster the protection, restoration, and/or enhancement of environmental and natural resources in the Bay, including fish and wildlife habitat; and to allow resource-dependent uses consistent with the continuance of the natural and environmental resources within the Bay.

The District will exercise a "preference" for conservation-related activities in the area covered by this use designation. That is, the District will preferentially consider proposed uses or activities within the area covered by this designation in terms of their potential desirability for maintaining, restoring, or enhancing the biological, water-quality, and other resource-based functions in the designated areas within Humboldt Bay, or (alternatively) in terms of their consequences for such uses.

(B) **Uses Authorized Within This Designation**. The following uses are examples of the kinds of uses that are expected to occur within the ***Bay Conservation*** use designation with a Use Permit from the District:

(1) Educational/scientific studies that include manipulating the environment
(2) Restoration and/or enhancement of environmental and natural resources, including fish and wildlife habitat, where such activities involve environmental manipulation
(3) Recreational activities that include or involve structures, organized group activities, or environmental manipulation
(4) Maintenance of existing structures, shoreline

protection, and similar activities for existing structures or uses

(5) Other types of conservation-related or maintenance-related activities or proposals not specifically identified above.

2.3 Combining Water Use District Designations

The District has identified two additional water use designations that will be assigned within geographically restricted subsets of the primary use (or "base") designations (the ***Bay Conservation*** and ***Harbor*** designations). These use designations will be considered to represent "overlay" or "combining" designations that will apply within the designated locations. The combining designations will not remove or change the underlying base designations. However, the District will exercise a preference for uses that are consistent with the requirements of the combining designations where these districts are assigned, subject to balancing the requirements of the base designation with the uses authorized by the combining designations.

Star struck

The District acknowledges that the establishment of the combining designations may lead to intensified use or management conflicts for the Bay within the designated areas; however, the assignment of specific regions in which the uses authorized by the combining designations will be considered as generally compatible with this Plan and will also provide additional certainty for Bay users and for future decision-makers about the intent of this Plan.

It should be noted that some uses that would be authorized under the combining designations might also be consistent with the directions indicated by this Plan in other parts of Humboldt Bay (such as proposed recreational improvements within portions of the ***Bay Conservation*** designation that are not indicated within the ***Marine Recreation*** combining designation). That is, the designation of certain areas in the Bay in which recreational or maricultural uses are "preferred" with respect to the Plan does not foreclose the potential consistency of such uses elsewhere, although such uses would be required to rebut a presumption that they might be better sited within the area of the appropriately designated combining use designation.

2.3.1 Marine Recreation

(A) **Purpose**. The ***Marine Recreation*** combining use designation identifies areas within Humboldt Bay in which recreational activities could be focused, according to adopted plans of local governments and the statements of citizens in the region. This designation will encourage, protect, and maintain coastal-dependent and coastal-related recreational uses and the development of recreational and visitor-serving uses.

The District will exercise a "preference" for recreation-related uses or activities in the area covered by this designation, subject to the considerations identified in this Plan that such uses or activities must be compatible with the management and safety considerations of the underlying designations. That is, the District will evaluate and consider the potential recreational benefits that would result from proposals within this use designation in terms of potential

operational impacts on (for example) coastal-dependent industrial uses, or the potential effects of the proposed recreational use on a spawning area for a commercially important fish species or an important loafing area for shorebirds.

(B) **Uses Authorized Within This Designation**. The following uses are examples of the kinds of uses or activities that are expected to occur within the ***Marine Recreation*** combining use designation with a Use Permit from the District:

(1) Recreational boating facilities, launch ramps, docks, and piers
(2) Water trails and water-trail support facilities
(3) Visitor-serving facilities and uses, including public and commercial recreation
(4) Boathouses, offices, or other structures related to recreational uses
(5) Ice and bait vending stations
(6) Interpretive, directional, or orientation signage placement and maintenance
(7) Hunting and recreational fishing facilities or enhancements that involve environmental manipulation
(8) Other recreational uses that involve structures or environmental manipulation
(9) Other types of recreational activities or proposals not specifically identified above.

2.3.2 Mariculture

(A) **Purpose**. The ***Mariculture*** combining use designation is included in the water use classification regulations to provide for shellfish mariculture and related uses of the waters of Humboldt Bay, consistent with other policies identified in this Plan.[2] The use of the Bay for aquaculture or mariculture is expected to remain primarily within Arcata Bay, which includes areas that have been leased previously by the District, the cities, or the State of California for mariculture purposes (see Figure 2-1 for these locations and Chapter 3.0 for additional information).

[2] The Management Plan does not currently address the siting or operation of potential maricultural operations for finfish, or for crabs, abalone, or other invertebrates, since such operations do not currently exist in Humboldt Bay. As noted in Chapter 3.0, however, the District expects to develop additional policies for mariculture activities in the future.

The combining use designation reflects a determination in this Plan that mariculture activities are generally appropriate within the designated area. The culturing activities would be expected to include growing and handling techniques in general mariculture industry use, subject to District review and approval pursuant to the policies in this Plan, as well as to all applicable laws and regulations under which the District operates (e.g., the California Environmental Quality Act). In addition, the proposed uses would remain subject to laws and regulations that are implemented by state and/or federal agencies.

This combining use designation incorporates only the culturing areas within Arcata Bay and Mad River Slough. Supporting uses, such as channel maintenance or dock repair for processing and shipping activities, are considered to be coastal-dependent or water-dependent industrial uses, which would be accommodated in the ***Harbor*** use designation area with an appropriate Use Permit and Tideland Lease approval from the District (the "upland" use of the processing facilities is not within the District's jurisdiction, and would require appropriate approvals from the City of Eureka or the County).

(B) **Uses Authorized Within This Designation**. The following uses are examples of the kinds of uses or activities that are expected to occur within the Mariculture combining use designation with a Use Permit from the District:

(1) Shellfish mariculture operations, using rack and bag, longline, stake culture, floating nursery or upwelling rafts, or other off-bottom culturing techniques
(2) Aquaculture operations for algae, kelp, or aquatic vascular plants

HARBOR POLICIES

USACE dredge Yaquina

Harbor Element Planning Policies

CHAPTER 3.0

3.1 Chapter Overview

The District, the City of Eureka, the County of Humboldt, and other local, regional, and state agencies recognize that one major focus of Humboldt Bay's management is the Port of Humboldt Bay, the largest harbor along the Pacific Coast between Coos Bay, Oregon, and San Francisco Bay. A Management Plan for Humboldt Bay must, therefore, include a policy framework for harbor-related uses. The Management Plan includes, in this Section, goals and policies that are generally related to land uses and development activities that are subject to District jurisdiction (activities that are not subject to the District's jurisdiction may still be regulated by other local, state, and federal agencies).

Bar warning sign—North Jetty

In addition, this chapter incorporates the substance of elements of the Coastal Act that are directly related to the maintenance of port-related or harbor-related facilities in Humboldt Bay. The District's jurisdiction over the facilities in Humboldt Bay is subject to the policies adopted by the California Legislature in the Coastal Act, which require the maintenance of existing coastal-dependent industrial facilities. In addition, the Coastal Act requires the maintenance of commercial fishing and aquaculture operations and opportunities. The Coastal Act's concerns for maintaining coastal-dependent industrial and shipping options is balanced by its concerns for protecting environmentally sensitive areas; this balance is also a signal feature of the District's approach to Humboldt Bay management, as reflected in this Plan.


Entrance Bay

This Plan chapter is focused on goals, objectives, and policies for these harbor-related elements. The policy basis established in this chapter will be considered by the District and other agencies as the framework for the District's actions in maintaining the commercial and industrial elements of Humboldt Bay that fall within the District's jurisdiction (i.e., the tidelands; the channels, and the dredging that is necessary to maintain them; the maintenance of shoreline protection devices; the creation, maintenance, or removal of shipping terminals and docks; the protection of the Humboldt Bay ecosystem for commercial fishing and aquaculture purposes; and the maintenance or development of aquatic or shoreside aquaculture).


Lumber barge in tow

As in other chapters in this Plan section, these policies are meant to be applied as an overall set of guidelines and within specific contexts, not singularly or in isolation. "Harbor" policies in this chapter must also be considered in conjunction with recreation and conservation policies that are identified in other parts of this document, given that the Public Trust incorporates uses in all of these categories.

As described in Section I, most of the harbor-related uses covered by this chapter are included within "Entrance Bay," which extends from approximately the Highway 255 bridge on the north to the Bay entrance and the channel to King Salmon and Fields Landing on the south. Most of the potential uses described by policies in this chapter occur predominantly within Entrance Bay. The policies in this chapter also incorporate mariculture uses that occur in Arcata Bay. This Plan chapter includes the designation of a "Mariculture District" in Arcata Bay, within which mariculture activities are identified as a preferred use (see below).

In 2003 the District, the City, and the County completed the ***Port of Humboldt Bay Harbor Revitalization Plan***, a joint effort to identify potentially advantageous harbor-related uses within the Bay (see Section II for additional information). Because the Revitalization Plan forms an essential element in the overall planning context for the Port, it is also an important part of the policy recommendations underlying the Humboldt Bay Management Plan, and the recommendations included in the Harbor Revitalization Plan that are important for District management of harbor functions are included in this Plan.

As indicated in the Revitalization Plan, harbor-related planning will work best if it is focused on activities and locations within the Bay that are particularly advantageous for Humboldt Bay and for coastal dependent industries that are suited for this region (Table 3-1). This Plan makes no presumptions with respect to the restoration of rail service to the Humboldt Bay region, and this Plan also recognizes that a number of the recommended revitalization approaches do not lie within the jurisdiction of the District. To the extent that the recommended actions do lie within the jurisdiction of the District, this Plan identifies implementation approaches that will assist in achieving the goals of the Revitalization Plan. Other Revitalization Plan elements may require actions by the City of Eureka and/or the County of Humboldt.

The Harbor chapter of this policy document incorporates policies that relate to numerous port-related activities carried out by the District, many of which were the subjects of comments from agencies or members of the public during the public review of the preliminary draft Plan. Based on the comments, a modification was made in one proposed policy:

- Policy language included in the Draft Plan has been modified to direct increased District consultation with the cites adjoining the Bay, which also manage tidelands, in order to develop a coherent approach to tidelands management for aquaculture uses of the tidelands.

In considering comments, District decision-makers determined that a number of the comments regarding mariculture/aquaculture carried policy implications significant enough to warrant continued study and future policy deliberation. Several sub-topics related to the management of mariculture will be considered further by District staff and decision-makers, in consultation with relevant federal, state, and local agencies, aquacultural practitioners, and members of the public, with the goal of formulating and adopting additional policy guidance during the initial revision period for the Plan (three to five years):

- Mariculture/aquaculture is correctly recognized as an appropriate Trust use of tidelands in the Bay, and the District's management approach must appropriately consider a variety of factors that may affect future mariculture proposals for Humboldt Bay, including:
  - Species or taxonomic groups being cultured or that could be cultured
  - siting options (including shoreside siting)
  - culturing technologies

Several substantive comments were made during the initial Plan review regarding Management Plan policy language for which District decision-makers determined that the proposed policies did not reflect the District's interests, including the following:

- Several commenters that requested that the District adopt policy language forbidding the use of "biocides" within areas subject to District jurisdiction. These suggestions have not been incorporated. In part this stems from the fact that the District is not a regulatory agency with respect to biocides (as has been consistently noted in the Plan). The decision to forego such a policy focus also arises from the District's policy decision to focus on exotic species management and/or habitat restoration, for which the District expects to maintain the possible use of herbicides as an optional tactic.
- The District will not adopt a policy focus regarding energy efficiency as a requirement for Bay management. While the District generally prefers energy-efficient designs and operations in District facilities and among applicants for District approvals, the District will not at the present time adopt or consider a policy addressing this topic.
- The District will not adopt a policy requiring that non-structural shoreline protection methodologies (such as extensive wetlands) be implemented in all shoreline protection instances. The already-proposed policy in the Plan clearly specifies the District's existing interest in non-structural methods, but the District's proposed policy maintains a feasibility test that District decision-makers determined to more fully reflect District's concerns for effectiveness.

Three additional Harbor-related policy elements proposed in comments were judged by District decision-makers to exceed the District's legal authority, and are not included in the Draft Plan, although the Draft Plan already included District approaches that reflect the District's existing authority under appropriate state and federal laws for these policy areas:

- Tsunami preparedness is an "emergency services" concern that is explicitly linked to federal and state agencies. While the District participates in the response teams for many kinds of emergencies that may affect Humboldt Bay (including oil spills, as noted below), the District is a "follower" rather than a policy-setter. As noted in the Draft Plan, one area in which the District has authority to act is in identifying the need for, and steps to accomplish, protecting or restoring Humboldt Bay's readiness to assist in large-scale emergency responses, including tsunami recovery. Appropriate policy language is already included in the Plan.
- Oil spill prevention and other toxics management concerns are also activities for which the District lacks legal authority to formulate primary policy. Such concerns are regulated by many federal and state laws, and federal and state agencies are designated under those laws as the primary policy-

With Rail Service Restored	With Current Rail Conditions
Marine-Dependent Industrial Projects	Marine-Dependent Industrial Projects
Niche Bulk Cargoes	Niche Bulk Cargoes
Marine Science & Tourism	Marine Science & Tourism
Aquaculture & Commercial Fishing	Aquaculture & Commercial Fishing
Boat Building & Vessel Repair	Boat Building & Vessel Repair
Forest Products Cargo Handling	Forest Products Cargo Handling
Public Bulk/Marine Industrial Dock Investment	Public Bulk & Marine Industrial Dock Investment
Coastal Feeder Barge Development	

Table 3-1. Recommended Harbor Revitalization Strategies.
(Source: Port of Humboldt Bay Harbor Revitalization Plan, 2003)

setters and responders to adverse events. The District participates in these programs, assuring that the requirements are met for Humboldt Bay. Appropriate policy language is already included in the Plan.

- Ballast-water regulation (essentially a focus on exotic species) is an area in which the District has historically been a leader, but this concern is also now delegated to federal and state agencies under existing federal and state laws. The District will continue to collaborate with these agencies to identify and implement appropriate control approaches for vessels entering Humboldt Bay, but the District does not have the option of adopting policy and performance requirements that are incompatible with those established in adopted federal and state laws.

The policies in this chapter are arranged by the following categories:

- Harbor-Related Land Use and Development (Policies HLU-1 through HLU-7)
- Shoreline Management (Policies HSM-1 through HSM-8)
- Dredging and Waterway Maintenance (Policies HWM-1 through HWM-8)
- Commercial Fishing and Aquaculture (Policies HFA-1 through HFA-8)
- Toxic Materials Management (Policies HTM-1 through HTM-3)
- Regulatory Streamlining (Policy HRS-1)

3.2 Harbor-Related Land Use and Development

3.2.1 Goals and Objectives

The Revitalization Plan identified potential sites for marine-dependent (or coastal dependent) industrial uses, and recommended implementation elements to assure that these sites would be available for use by potential coastal dependent industrial users; the HBMP does not address upland land uses, but the District can utilize the policy focus in the HBMP to assure that areas within the District's jurisdiction support coastal-dependent uses identified in adopted land use plans

Goals

- Assure (with upland agencies) the availability and readiness of large coastal dependent industrial sites adjacent to Humboldt Bay
- Assure (with upland agencies) the development and long-term maintenance of harbor-related infrastructure in Humboldt Bay

Objectives

- Working with local governments, protect designated water-dependent or coastal-dependent industrial sites near Humboldt Bay and maintain opportunities for designating additional water-dependent or coastal-dependent industrial sites and uses near Humboldt Bay
- Working with local, state, and federal agencies, facilitate reviews that are necessary for implementing water-dependent or coastal-dependent uses and other harbor-related uses and infrastructure

3.2.2 Policies

HLU-1: Harbor-related uses shall have priority under this Plan within the portions of Humboldt Bay designated for port-related or harbor-related uses

Policy: Within the portion of Humboldt Bay identified in this Plan as having a priority for harbor-related uses (see Figure 2-1 in Chapter 2.0), the District shall adopt, for elements that are subject to the District's jurisdiction, and identify a preference for, proposals and uses that are related to the existence of Humboldt Bay as a port or harbor. Such uses include, but are not limited to, the following:

- Shipping terminals, docks, wharves, and other facilities and operations related to national or international shipping.
- Marinas, piers, docks, buying stations, processing plants, and other facilities and operations that are related to commercial and recreational fishing and other related water-based uses.
- Docks, piers, floats, and other facilities and operations that are related to aquaculture, mariculture, and similar uses.
- Chandlers, offices, warehouses, yards, and other

shoreside facilities and operations, to the extent that these uses are subject to the District's jurisdiction.

Harbor-priority use areas shall be protected for harbor-related uses and ancillary activities. Other uses, especially public access and public and commercial recreational developments, shall be permissible uses provided they do not significantly impair the efficient utilization of the harbor-priority areas.

Discussion: This policy establishes a priority for harbor-related uses in areas that are designated by the District, the County, the cities, the Coastal Commission, or other parties as reserved for water-dependent, coastal-dependent, or harbor-related uses.

HLU-2: Assist local, regional, and state agencies in identifying and protecting harbor-related land uses in Humboldt Bay, and in developing increased institutional capability in the planning, regulatory, and development programs related to such uses

Policy: The District shall consult with the County of Humboldt, the City of Eureka, the City of Arcata, the California Coastal Commission, and other use-regulating agencies in order to identify upland areas that are reserved for water-dependent activities and uses (or "coastal-dependent" activities and uses, as defined in the California Coastal Act). The District shall assign a policy priority to harbor-related elements or actions that are associated with such uses, including shoreline protection, wharfage or terminal development, dredging, and other development or maintenance actions. The District shall seek to assure that other local land use and zoning documents incorporate the protection of harbor-related uses within the Humboldt Bay watershed, and that other use-regulating agencies are prepared for protecting and facilitating such uses.

Discussion: This policy addresses actions that are associated with protecting land use designations that support the continued identification of Humboldt Bay as a port or harbor. Policies that recognize the significance of Humboldt Bay as a regional port are needed from local, regional, and statewide regulatory agencies; appropriate actions by these agencies include reviews of potential effects on harbor-related functions within the Bay, and local, regional, and statewide policies that protect the harbor-related functions against potential conflicts from non-harbor uses. In addition, this policy authorizes the District to assist other agencies as necessary to assure the availability and readiness of sites for harbor-related uses.

HLU-3: Assist in removing potential constraints for marine-dependent or coastal-dependent land uses along the Samoa Peninsula, Fields Landing Channel, Eureka shorelines, and other harbor-related areas (from Harbor Revitalization Plan)

Policy: The District shall work collaboratively with the City of Eureka, the County of Humboldt, and the California Coastal Commission to assure a "pre-designation" and "pre-zoning" of industrial sites on the Samoa Peninsula, in the King Salmon and Fields Landing region, and along the Eureka shoreline in order to remove potential obstacles for coastal-dependent or marine-dependent industrial uses.

Discussion: The District will monitor future land use decision-making and local agency land use discussions to assure that appropriate designations are maintained, and that decision-makers consider potential implications of future actions on these land uses. If appropriate, the District will consult with other local agencies to increase the visibility of shoreline sites for harbor-related uses, and will assist applicable upland land use agencies in obtaining necessary approvals to assure the designation of such sites.

HLU-4: Assist in removing potential constraints for marine-dependent or coastal-dependent land uses on harbor-related parcels in the South Bay (from Harbor Revitalization Plan)

Policy: The District shall work collaboratively with the County of Humboldt and the California Coastal Commission to assure a "pre-designation" and "pre-zoning" of industrial sites in the South Bay (King Salmon and Fields Landing) to remove potential obstacles for coastal-dependent or marine-dependent industrial uses.

Discussion: The District will monitor future land use decision-making to assure that appropriate

designations are maintained, and that decision-makers consider potential implications of future actions on these land uses. If appropriate, the District will consult with other local agencies to increase the visibility of shoreline sites for harbor-related uses, and will seek necessary approvals to assure the designation of such sites.

HLU-5: Provide information for the public, and for decision-makers and staff of government institutions, to facilitate protecting and enhancing harbor-related opportunities for Humboldt Bay

Policy: The District shall increase public and decision-maker awareness about processes and land use issues related to harbor-related uses in Humboldt Bay. The District shall assure that elected and appointed decision-makers and the public are informed about how decisions affecting Humboldt Bay's harbor-related functions are made, and that the potential effects on the harbor's functions resulting from inappropriate land use planning decisions are communicated to decision-makers and the public.

Discussion: In order to maintain the availability of coastal-dependent or water-dependent (i.e., harbor-related) land uses, staff and decision-makers in land use agencies must be aware of the land use requirements of these uses. In addition, members of the public who are aware of these requirements will help maintain the appropriate policy focus for the land use agencies. This policy establishes a District responsibility to monitor the land use decision-making for local agencies and to provide information to the agencies and the public with respect to the needs of harbor-related uses.

HLU-6: Develop "specific plans" for District-owned parcels

Policy: The District shall create site-specific management plans for the parcels which the District currently owns, or that the District may acquire in the future, including: (1) Woodley Island, (2) the Buhne Point/King Salmon restoration area, (3) the Fields Landing boat repair facility/Kramer Dock, (4) the Park Street mitigation site, (5) the District's Elk River parcel, and (6) the Samoa redwood dock facility. The management plans shall designate suitable land uses at each facility, together with management options and policies that the District shall use to implement this Plan on each site.

Discussion: The District-owned sites represent locations at which the District has the authority to enact the policies in this Plan directly. In planning the uses of these sites the District has an increased ability to carry out the policies in this Plan. The site-specific plans that will be developed will identify the District's desired uses and the nature of the management directions that follow from this Plan's policies. The District will adopt the site-specific plans with appropriate environmental reviews and with full public participation in the decision-making process.

HLU-7: Proposals for bay-related activities approved by the District shall incorporate appropriate noise control measures to avoid or reduce noise effects on events and activities carried out near the bay, to the extent feasible

Policy: The District shall consider the potential noise and vibration effects of proposals that are subject to the District's jurisdiction. Should evidence indicate that the proposed actions may be associated with significant noise- or vibration-related effects on important cultural or social activities that occur near the bay (including Native American activities as well as cultural and economic events sponsored by other governments or by independent groups of bay users), the District shall require that mitigation measures be incorporated into the activities covered by the proposals in order to avoid or reduce potentially significant noise and vibration effects to the greatest extent feasible.

Discussion: Some bay uses (particularly new facility construction or the rejuvenation of existing docks, bulkheads, etc.) are likely to be associated with episodic short-term to intermediate-term noise generation (e.g., pile-driving), and some potential bay uses could be associated with operating noise concerns. Even short-term noise generation could adversely affect cultural uses, however, such as some Native American ceremonial events on Indian Island or shoreside cultural events such as "Blues by the Bay." The District has limited authority to address potential noise impacts

resulting from land uses in upland areas, because those uses are subject to the regulatory jurisdiction of other agencies. This policy establishes the District's authority to require mitigation for noise generated by proposals that are subject to District jurisdiction. It is likely that this policy will primarily be implemented in conjunction with the District's approval of proposals for construction projects.

3.3 Shoreline Management

3.3.1 Goals and Objectives

Harbor management within Humboldt Bay includes maintaining the docks and shoreline protection features that enable the harbor's long-term operation.

Goals

- Maintain shipping terminals, marinas, and related shoreside facilities within Humboldt Bay that support commercial shipping and other water-dependent or coastal-dependent uses
- Maintain shoreline protection measures that protect uplands from encroachment by the Bay while protecting the Bay from the effects of upland uses

Objectives

- Identify and develop concurrence regarding necessary improvements for existing shipping terminals that will accommodate anticipated future needs
- Identify needs for future or new shipping terminals necessary to implement adopted land use plans for the Humboldt Bay region
- Identify and develop concurrence regarding shoreline protection measures needed for protecting developed levees, seawalls, docks, and other shoreline features
- Develop a coordinated regulatory approach to shoreline development planning and approval

3.3.2 Policies

HSM-1: Develop an inventory of shipping terminal facilities necessary to carry out adopted harbor-related planning policies for Humboldt Bay

Policy: Acting in conjunction with the City of Eureka, the County of Humboldt, and other affected parties, the District shall develop an inventory of existing shipping terminal, dock, wharf, pier, and similar shoreline facilities within Humboldt Bay. The uses of each structure under current management practices shall be identified, along with needed improvements in order to maintain existing uses. The District, in conjunction with the City, the County, and the public, shall also identify prospective or potential future uses for the existing facilities, together with an assessment of necessary improvements that will be needed in order to meet prospective future uses.

Discussion: Maintaining harbor-related activities within Humboldt Bay means maintaining terminal facilities. These facilities are considered coastal-dependent uses and are also a priority for coastal plan implementation. In order to maintain the facilities they must be recognized as essential facilities or sites. The shipping terminal facilities have an inherent relationship to the channels within Humboldt Bay, and the channels and the terminal facilities must be understood to be mutually interdependent

The interrelationships among the shipping terminals and the Bay's channels places the primary responsibility for maintaining this inventory with the District, and the primary local agency responsibility for assuring the implementation of policies related to harbor activities and shipping rests with the District.

The District will consult with the Coastal Commission and the U. S. Army Corps of Engineers with respect to the long-term maintenance needs of the identified shipping facilities, including the potential need for new or replacement terminal facilities.

HSM-2: Develop an inventory of shoreline protection devices, identify potential needs for additional protection, and develop standards for new and existing Humboldt Bay shoreline protection

Policy: The District shall develop a program for conducting an inventory of the shoreline protection devices within Humboldt Bay, including levees, slope protection, bulkheads, pilings, and other devices that protect the shoreline and adjacent uplands from potential losses because of erosion or shoreline failure.

The inventory shall include a preliminary assessment of the integrity of existing shoreline protection devices, and shall include a preliminary assessment of any deficiencies that may exist in the overall shoreline protection system of the bay. The District shall develop a consistent set of standards with respect to shoreline improvements (levee protection, levee maintenance programs, culvert replacement policies, etc.), which shall apply for all shorelines of Humboldt Bay. The standards shall be developed with a consideration of any improvements necessary to increase shoreline protection in consideration of anticipated increases in sea level, potentially increased erosional forces resulting from increased storminess, and other factors that may be deemed relevant by the District. These standards shall include considerations for public access. Additionally, these standards shall address potential effects to cultural resources.

Discussion: The District will seek technical assistance in developing a proposed program of "standard improvements" for use by the District and other local governments. The District will identify appropriate guidelines and standards for shoreline areas that will be impacted by development. The standards will address the circumstances normally encountered in maintaining shoreline structures and facilities, and will also identify adequate payments to local agencies to assure that the level of review necessary to assure the safety of the proposed projects will be provided.

Mad River Slough

The District will seek to develop a "Humboldt Bay Blue Book" that provides standards and details of acceptable practices, designs, materials and methods for culvert/tidegate installation, road crossing installation and protection, levee repair and armoring, shoreline protection, piling installation/removal, maintenance dredging and other activities in Humboldt Bay. Consistent standards may enable regulatory streamlining for proposals that are developed in conformance with the adopted land use documents; proposals that meet the pre-requirements for the "standard improvements" may warrant reduced regulatory reviews.

HSM-3: Develop appropriate, consistent shoreline protection guidelines for commercial, industrial, and residential development around Humboldt Bay

Policy: The District shall work collaboratively with the City of Arcata, the City of Eureka, the County of Humboldt, relevant state and federal agencies, the Wiyot Tribe, and other interested parties to identify appropriate guidelines for shoreline protection that meets the requirements of the local, state, and federal agencies. The District shall incorporate standards and guidelines that address potential seismic effects and land-stability hazards, including effects that are related to tsunami events that may affect shoreline stability and bay-margin land uses in the Humboldt Bay region.

Discussion: As identified in the Revitalization Plan, there is a need for a coordinated review of planning policy for the shoreline of Humboldt Bay, particularly involving coastal-dependent industrial uses. The review should align the elements of the planning documents of these jurisdictions, and the review should also accommodate the policy requirements of the California Coastal Commission and the U. S. Army Corps of Engineers. The review should accommodate site-specific concerns for various shoreline types, and should address the regulatory process for individual projects that are consistent with the adopted plans. Development proposals consistent with the standards of such a plan may warrant reduced regulatory reviews.

HSM-4: Require maintenance according to the District's adopted shoreline protection standards

Policy: Authorized protective projects shall be maintained according to a District-approved long-term maintenance program which assures that the shoreline will be protected from tidal erosion, and that the project will have acceptable effects on environmental resources during the life of the erosion-control project.

Discussion: Maintenance of the installed shoreline protection shall be considered part of the application of the District-approved improvements. The District may withhold approval for proposals that do not include adequate information to allow the District to assess long-term shoreline protection adequacy. At the same time, the District will evaluate the proposed shoreline protection for potential adverse long-term consequences to environmental resources and physical features of Humboldt Bay (as by erosion or accretion), and may direct that the shoreline protection measures be modified in order to reduce adverse long-term effects on the environment.

HSM-5: Require evidence that shoreline protection proposals protect the environment and meet District requirements

Policy: Shoreline erosion control projects and the maintenance or reconstruction of existing erosion control facilities shall only be approved where: (a) the project is necessary to protect the shoreline from erosion; (b) the type of the protective structure is appropriate for the project site and the erosion conditions at the site; and (c) the project is properly designed and constructed. The District shall require design documents as part of the application for shoreline erosion-control projects that demonstrate knowledge of the District's requirement and experience in coastal erosion processes. Designs shall demonstrate appropriate consideration for public access improvements.

Discussion: The adequacy of designs for shoreline structures requires the application of the standards developed by the District in consultation with other agencies. In addition, the protection of the aquatic environment in Humboldt Bay requires that unnecessarily extensive shoreline protection be avoided. This policy addresses the District's submittal and review standards.

HSM-6: Require the use of non-structural shoreline protection where feasible and appropriate

Policy: Shoreline protective projects shall include provisions for nonstructural methods (such as marsh vegetation) where feasible. Along shorelines that support marsh vegetation or where marsh establishment has a reasonable chance of success, the District may require that the design of authorized protective projects include provisions for establishing marsh and transitional upland vegetation as part of the protective structure. Designs shall consider elements to enhance public access, where feasible and appropriate.

Discussion: Where feasible, the District will include the use of non-structural shoreline protection. This policy assures that restoration or enhancement projects are not required to incorporate shoreline protection standards that adversely affect the purposes of such projects.

HSM-7: Identify needs for potential shoreline improvements necessary to accommodate bay water surface elevation changes, including potential effects of climate change

Policy: The District shall consult with the County of Humboldt, the City of Arcata, the City of Eureka, other affected local agencies, relevant state and federal agencies, and affected local parties to identify the potential effects on the Humboldt Bay shoreline and nearby areas that may occur because of meteorological or climate-related water surface-level fluctuations in the bay prior to the year 2050. Based upon these consultations, the District and other affected parties shall develop a plan that identifies any necessary shoreline alterations or maintenance programs needed to accommodate the water-level fluctuations. The District shall adopt findings with respect to the contents and recommendations of this plan when approving District operational programs or when approving any application for project approval submitted to the District.

Discussion: The District is the local agency responsible for shoreline management within Humboldt

Bay to the line of Mean High Water, and this policy directs the District to monitor the need for potential actions by the District or others that may result for the bay's shoreline because of future sea level increases. As this Management Plan is adopted there is no consensus on the extent of sea level rise that may result from changing climate, but the District has found that there is evidence that supports a projected future increase in sea level. This policy directs that the District form a collaborative working group that includes other agencies concerned about sea level in Humboldt Bay, and the policy also directs that the District prepare a plan to address any necessary District responses to rising sea level. The subsequent plan will identify appropriate District responses with respect to rising sea level and the extent of proposal-related actions that the District will assign to applicants for District approval.

HSM-8: Develop coordinated plan for addressing seismic effects, land stability, and tsunami response plan for Humboldt Bay

Policy: The District shall work collaboratively with the California Office of Emergency Services, other appropriate local, state, and federal agencies, and other interested parties to identify roles and responsibilities that are appropriate for the District in responding to seismic events, tsunamis, or other major sources of damage to infrastructure or regions of Humboldt Bay that are subject to District jurisdiction. The District shall develop suitable emergency response plans for all District-owned properties or facilities that address such events, and shall assure that persons who visit District-owned sites are apprised of the elements of these plans.

Discussion: Currently there is no coordinated plan for addressing effects within Humboldt Bay or along its shorelines that might result from major earthquake or tsunami damage. This policy provides direction to the District to develop a response plan for areas within the bay subject to District jurisdiction, in coordination with appropriate federal, state, and local emergency response agencies, earthquake and tsunami-preparedness interests, and other local affected or interested parties. The plan will also provide response direction for District-owned sites and facilities within the bay.

3.4 Dredging and Waterway Maintenance

3.4.1 Goals and Objectives

Assuring that Humboldt Bay's harbor functions continue to be available in the future requires that the shipping channels within the bay, as well as the bay's entrance, be maintained at depths suitable for commercial vessels in use in the world today. The Management Plan identifies the District's responsibility for planning and maintaining these channels.

The construction, excavation, or deepening of channels and marinas and/or the periodic maintenance dredging of the channels and marinas in Humboldt Bay are necessary for the continued harbor-related functions that are the subject of this Plan chapter. Maintaining these waterways also supports recreational boating and fishing pursuits enjoyed by residents and visitors, as well as supporting the activities commercial fishermen and others who depend on safety in navigating Humboldt Bay.

Goals

- Maintain Humboldt Bay's channels to be compatible with the requirements of commercial shipping and other water-dependent uses of the Bay
- Conduct channel maintenance dredging that is compatible with maintaining environmental resource values in Humboldt Bay

Objectives

- Dredging and other channel maintenance activities within Humboldt Bay should be developed or maintained that:
  - insure that navigational safety is maintained for all users
  - insure that ships and maritime vessels may travel safely into and out of Humboldt Bay
  - maintain the usability of identified waterfront commercial and water-dependent industrial sites
  - maintain public facilities such as Woodley Island Marina and the City of Eureka Public Marina

- maintain natural processes that protect beach or shoreline stability
- maintain existing environmental resources associated with the Bay's channels

3.4.2 Policies

HWM-1: Safe navigation in Humboldt Bay is a priority

Policy: The District shall assist the U. S. Coast Guard and the U. S. Army Corps of Engineers in identifying the requirements for maintaining safe navigation within Humboldt Bay, including channel depth, channel markings, the absence of obstructions, and other factors that may arise from time to time.

Discussion: This policy establishes the District's overriding responsibility to assure safe navigation in the areas under the District's jurisdiction, and directs that the District consult with the relevant federal agencies to assure appropriate action.

HWM-2: Dredging may be authorized to meet Plan purposes

Policy: Dredging within Humboldt Bay or in the Bay Entrance may be authorized when:

- dredging will serve water-dependent (coastal-dependent) uses, or will maintain or enhance navigational safety;
- materials to be dredged meet appropriate quality requirements of the North Coast Regional Water Quality Control Board and the U. S. Environmental Protection Agency;
- dredging will be carried out with the least-environmentally damaging feasible method available;
- dredging will include the minimum volume necessary to accomplish the proposed purposes; and
- dredged materials will be disposed of in accordance with adopted District, Regional Water Quality Control Board, and U. S. Environmental Protection Agency requirements.

Discussion: Dredging is a necessary harbor-maintenance activity. This policy establishes the essential conditions under which dredging may be authorized as compatible with this Plan.

HWM-3: Re-deposition of dredged materials within Humboldt Bay may be authorized to meet Plan purposes

Policy: Dredged materials may be reused or deposited within Humboldt Bay areas subject the District's jurisdiction only for the following uses:

- the restoration or enhancement of environmentally sensitive or valuable habitat conditions, for which findings may be made that the use of dredged materials results in the desired ecological conditions, consistent with this Plan;
- the development of suitable water-dependent (coastal-dependent) uses, consistent with this Plan; and
- the development of appropriate coastal access or recreation projects, consistent with this Plan.

The dredged material shall be deposited only at locations approved by the District, in the volumes approved by the District. The District shall only approve dredge disposal proposals that include adequate information to allow the District to find that the volume of material and the quality of the material to be disposed of are suitable for the proposed uses, including suitability for structural characteristics as well as suitability for habitat characteristics. In addition, the District must find that the proposed disposal or re-use will not adversely affect navigation within Humboldt Bay.

Discussion: Disposing of dredged material is a necessary harbor-maintenance activity. Most dredged spoil disposal does not take place within Humboldt Bay. When consistent with approved plans for restoration or enhancement of environmental values, dredge spoil placement inside Humboldt Bay may have an environmentally positive effect. This policy establishes the essential conditions under which dredge-spoil placement inside Humboldt Bay may be authorized as compatible with this Plan.

HWM-4: Placement of fill within Humboldt Bay may be authorized to meet Plan purposes

Policy: The placement of fill into areas subject to the District's jurisdiction may be approved if the District finds that the fill and the uses proposed for the fill are consistent with the Public Trust Doctrine, that

the fill placement constitutes the least environmentally damaging alternative method for achieving the desired uses, and that any adverse effects resulting from the fill placement are mitigated to the greatest practicable extent.

Discussion: Fill placement into Humboldt Bay or other waters subject to the District's jurisdiction may be carried out when the purposes of the proposed fill placement are consistent with this Management Plan and other local, state, and federal laws. This policy establishes the District's authorization to approve the placement of fill into Humboldt Bay, subject to consistency with appropriate laws and with the Plan.

HWM-5: Potential dredged-material management options and alternative disposal methods shall be identified in a Long Term Management Strategy for Humboldt Bay

Policy: The District shall develop a Long Term Management Strategy (LTMS) for Humboldt Bay, incorporating the following goals:

- Maintain in an economically and environmentally sound manner those channels necessary for navigation in Humboldt Bay and eliminate unnecessary dredging
- Maximize the use of dredge material as a beneficial resource
- Establish a cooperative permitting framework

The District shall consult with academic institutions, other agencies, and interested parties, as appropriate, to identify potential re-use alternatives and sites for dredge spoils. Appropriate options shall include wetland restoration or enhancement, levee maintenance, or other uses that are consistent with this Plan or other adopted land use documents.

Discussion: The District will take a leadership role in developing an LTMS, which shall focus on identifying an inventory of sites around the Bay, and the type and quantity of material necessary, that may be beneficial in habitat enhancement, material disposal, and other forms of dredged material re-use. The District will identify areas around Humboldt Bay where dredge material could enhance habitat or other desirable land uses.

HWM-6: Sediment dynamics in Humboldt Bay shall be identified and a sediment management approach for Humboldt Bay shall be developed

Policy: The District shall cooperate with academic institutions, other agencies, and interested parties, as appropriate, to characterize the processes by which sediment enters, leaves, and is stored within Humboldt Bay. This cooperation may take the form of data-management assistance, mapping, funding, or other appropriate approaches. The District shall assist in the development of a sediment-management program or approach for Humboldt Bay.

Discussion: The District will assist in appropriate ways in the development and implementation of sediment management models for Humboldt Bay, owing to the importance of sediment dynamics in the Bay's management for harbor-related uses. To the extent possible, the District will collaborate with personnel from academic institutions and agencies to develop a Humboldt Bay Sediment and Dredged Material Management Plan. The District will assist in the development of management models for maintaining adequate channel depth for navigation, flood control, and water conveyance while reducing the adverse effects of dredging activities on Humboldt Bay's resources. Possible model focuses include:

- Potential alternative dredge-spoil disposal sites
- Potential dredged-material re-use options for habitat restoration
- Potential models of sediment transport, erosion, and deposition

HWM-7: Evaluate the extent of maintenance dredging required to meet the Management Plan's objectives

Policy: The District shall monitor the extent of maintenance dredging that is necessary to attain the policy balance required by the Management Plan. The District shall adopt an internal management objective that directs District personnel to monitor sediment deposition within the bay's navigation channels, in moorages, near docks, and in other locations that have historically needed dredging to maintain their utility for bay users. The District shall also monitor user needs by actively soliciting comments from bay user groups

and interested parties. District staff shall annually report to the Board of Commissioners regarding the current need for maintenance dredging. The District shall consider, no less frequently than once during each five-year period in which the Management Plan is in effect, whether the overall maintenance dredging policy framework adopted for the bay continues to meet the Management Plan's objectives.

Discussion: Maintenance dredging is a major activity carried out in Humboldt Bay, in part by the District and in part by federal action agencies. The District has concluded that meeting the Management Plan's objectives will require that maintenance dredging continue in the future. This policy directs that the District monitor (in conjunction with the sediment-dynamics monitoring called for in the previous policy) the need for the maintenance of dredged depths required to meet the Management Plan's objectives for uses in the bay (e.g., navigation channels, moorages, etc.).

HWM-8: Evaluate channel maintenance alternatives for the community of King Salmon

Policy: The District will assist the residents in the community of King Salmon in developing a program for maintaining channels in the community of King Salmon, to the extent possible

Discussion: King Salmon experiences both physical and financial constraints in maintaining the channels within the community. The District will assist in developing a maintenance program for King Salmon, to the extent feasible, including sediment-management options and potential funding options.

3.5 Commercial Fishing and Aquaculture

3.5.1 Goals and Objectives

The California Coastal Act states:

- "[F]acilities serving the commercial fishing and recreational boating industries shall be protected and where feasible, upgraded. Existing commercial and recreational boating harbor space shall not be reduced unless the demand for those facilities no longer exists or adequate substitute space has been provided. Proposed recreational boating facilities shall, where feasible, be designed and located in such a fashion as not to interfere with the needs of the commercial fishing industry." (Section 30234)
- "[T]he economic, commercial, and recreational importance of fishing activities shall be recognized and protected." (Section 30234.5)
- "Ocean front land that is suitable for coastal dependent aquaculture shall be protected for that use, and proposals for aquaculture facilities located on those sites shall be given priority, except over other coastal dependent developments or uses." (Section 30222.5)
- "The Legislature finds and declares that salt water or brackish water aquaculture is a coastal dependent use which should be encouraged to augment food supplies and to further the policies set forth in Chapter 4 (commencing with Section 825) of Division 1." (Section 30411(c))

These policy statements from the Coastal Act emphasize the importance of these coastal-dependent uses for the Management Plan.

Goals

- Humboldt Bay will continue to support commercial fishing and aquaculture
- Commercial fishing and aquaculture management will be based on increased knowledge about the fishery and other environmental resources in the Bay, and the effects of management on them

Objectives

- Management plans for aquaculture in Humboldt Bay, addressing both aquatic areas and potential sites for land-based operations, will be based on increased knowledge of the Bay ecosystem and the effects of aquaculture on it
- An area will be designated in Arcata Bay in which aquaculture is to be considered a preferred use of Humboldt Bay tidelands
- The District will establish, with the City of Arcata and the City of Eureka, compatible policies with respect to tidelands managed for mariculture or aquaculture

- Where appropriate, shoreside land areas will be designated that support commercial fishing and aquaculture, and necessary infrastructure and improvements will be developed
- Management of commercial fisheries resources will be based on increased scientific knowledge of fish population dynamics, habitat dynamics, and the overall productivity of the Bay and nearby Pacific Ocean
- Consumers of aquatic species will adopt management that is fully informed regarding ecosystem processes and regulations that affect these resources
- Actions that affect populations of native and desirable non-native marine species in Humboldt Bay will be understood, monitored, and integrated into Bay management
- Requirements for Essential Fish Habitat will be identified and implemented as part of the Bay's management

3.5.2 Policies

HFA-1: The District shall plan for, designate locations for, and seek to provide adequate berthing, marina space, moorage, and other facilities necessary to meet the operational and maintenance needs of commercial fishing vessels, recreational boats, and other small watercraft

Policy: The District, in collaboration with the California Department of Boating and Waterways, other state and federal agencies, local government jurisdictions, members of the commercial fishing fleet, recreational user groups, and other interested parties, shall monitor, on an ongoing basis, the need for berthing or moorage space for small watercraft in Humboldt Bay. Should the monitoring indicate a need for additional marina slips, berthing space, or other moorage needs for small watercraft (including space needed by the commercial fishing fleet using Humboldt Bay, as well as the needs of recreational boaters and those using other small watercraft) the District shall assume the lead responsibility for pro-actively developing plans for increasing the available berthing in the bay. The District shall also consider needs for waterside and shoreside support facilities and services appropriate for these user groups, including a need for boat repairing and maintenance facilities, and shall pro-actively plan for meeting identified needs.

Discussion: The District's enabling legislation directed that the District provide adequate berthing, moorage, and/or anchorage for the range of maritime activities carried out with smaller watercraft that take place in Humboldt Bay. The identification of boating-related berthing, mooring, or anchorage options constitutes an essential part of the District's trust obligations for tidelands management. This policy codifies the District's legislative obligations in the Management Plan, directing that the District monitor and plan for necessary berthing, moorage, anchorage, maintenance and repair, and other facility needs for the various categories of smaller watercraft that use Humboldt Bay. When a need for additional berthing, moorage, repair yard, or other facilities is identified, the policy directs that the District plan for and develop those facilities, including securing funding and approvals from other agencies where necessary.

HFA-2: Support the improvement of existing fish landing, buying, and processing facilities in the Humboldt Bay area

Policy: The District shall coordinate with the City of Eureka, the County of Humboldt, other appropriate agencies, local fish buyers and processors, and other affected private interests with respect to the needs of commercial fishers and seafood buyers. Improvement or modernization of existing commercial fishing facilities and construction of new commercial fishing boat berthing, fish off-loading, and fish handling facilities shall be developed at appropriate sites under District jurisdiction having access to Bay waters and to land transportation routes, subject to approval under policies in other applicable plans.

Discussion: In collaboration with other local agencies and affected parties, the District will evaluate current fish landing, buying, and processing facilities and identify needs for improvement. The District will seek to maintain existing facilities, or to develop new or upgraded facilities where appropriate, for loading and offloading fishing gear, machinery, and fish.

HFA-3: Protect appropriately designated shoreside areas for the development, maintenance, or expansion of commercial fish processing and aquaculture facilities or activities

Policy: The District shall coordinate with the City of Eureka, the County of Humboldt, and other appropriate land use agencies to assure that lands for commercial fish landing or processing facilities, or for aquacultural uses, will continue to exist near Humboldt Bay in designations such as "waterfront commercial," "coastal dependent industrial," "marina," or "agriculture."

Discussion: In collaboration with other agencies and affected parties, the District will assure that land use plans continue to include designated sites for commercial fish processing and aquacultural uses.

HFA-4: Assist in developing agency approval strategies and funding for commercial fishing and aquacultural marketing and outreach activities in Humboldt Bay

Policy: The District, in collaboration with other agencies and members of the commercial fishing and aquaculture sectors, shall seek investment in public marketing and outreach for fishing-related or aquaculture-related commercial ventures, where appropriate. These efforts shall include fishery resources such as salmon, albacore, halibut, crabs, and oysters.

Discussion: The District will assist commercial fishers and aquaculture operators in identifying and taking advantage of opportunities for developing new fish- or aquaculture-related markets.

HFA-5: Identify additional aquaculture opportunities in Humboldt Bay

Policy: The District shall support efforts by the aquaculture industry to develop new products or new markets. The District shall coordinate mariculture management so that these uses are compatible with management for ecological values and recreational uses. Commercial aquaculture or mariculture operations and facilities shall be identified as compatible with other management goals in the portions of Humboldt Bay designated in this Plan as having a priority for mariculture use and port-related uses. The District shall work collaboratively with the City of Arcata and the City of Eureka to coordinate policies regarding the management of tidelands within the Bay for aquaculture purposes.

Discussion: The District will continue to support research regarding the effects of commercial aquaculture on the Humboldt Bay ecosystem. The District will support evaluations of aquacultural potential for additional species in Humboldt Bay (including seed-nurturing opportunities), including recreationally important species. The District will support studies of using HBMWD's industrial water supply for aquaculture purposes. The District will support potential aquaculture opportunities associated with any potential industrial project that would generate process (cooling) water.

The District will continue its work in improving the conservation and management practices related to mariculture in Humboldt Bay, including improvement in existing operations within Humboldt Bay. Because both of the cities adjoining the Bay bear responsibilities for tidelands management, the District will work with the cities in order to identify a coherent management approach, and to the extent feasible to develop consistent management guidelines, for aquaculture/mariculture in the Bay's tidelands.

HFA-6: Designate a Preferred Aquaculture Use Area in Arcata Bay, and require Best Management Practices to meet environmental constraints

Policy: The District shall, upon consideration of protecting the existing environmental resources present in Arcata Bay and in conjunction with knowledge about the state's support of aquaculture, designate a region within Arcata Bay that shall be designated as an "Aquaculture Preferred Use Area." Within this area, the District shall regulate aquaculture as a priority use, subject to environmental constraints established by existing laws and regulations. The District shall require the implementation of a suite of industry-adopted and agency-approved Best Management Practices as the regulatory basis for aquacultural operations within the designated area. The District shall use information gained from monitoring the aquaculture activities to refine or modify the Best Management Practices and

other conditions of approval (that is, the District shall employ "adaptive management" in its management of aquaculture operations in Humboldt Bay).

Discussion: The District expects to identify, in a time frame that includes the life of this Management Plan, a combination of specific use areas and agency-adopted Best Management Practices (BMPs) addressing the environmental effects of aquaculture. When the suite of BMPs have been developed and adopted, the District intends to allow aquaculture operators additional freedom to plan and execute culturing activities within the designated area within Arcata Bay. At the present time the District does not have a definite expectation for the fraction of the designated area that will be leased or permitted; (the general area under consideration is identified in Figure 2-1, in Chapter 2.0), and the area used is expected to be a subset of the area shown in the figure. At the present time, the area under Lease or permit for the primary oyster grower in Humboldt Bay is approximately 300 acres, and it is likely that the actual areas used by this grower in the future will not be a significantly greater percentage of the designated aquaculture ("mariculture") combining designation (approximately 3950 acres).

The District may approve proposals for aquacultural uses in other areas subject to District jurisdiction, using any of a variety of technical and managerial approaches that otherwise comply with local, state, and federal requirements; the District expects to refine the policy approach that will support this result through collaboration with appropriate agencies, aquaculture operators, and members of the public, in order to formalize appropriate policy in a future revision to this Plan.

The suite of BMPs that will be required by the District is expected to be developed through time as a result of studies currently being conducted in Humboldt Bay and in other west coast estuaries in which oyster mariculture is conducted. The regulation of mariculture impacts on Humboldt Bay is a District responsibility, in collaboration with other regulatory and trustee agencies, and the District intends to adopt management requirements for mariculture that are compatible with both the continuation of the industry and the protection of Humboldt Bay's environmental resources.

HFA-7: Identify ecological and environmental factors affecting Humboldt Bay's fish populations, and the ecosystem elements that support them

Policy: The District shall support legislative and educational efforts to develop a more thorough understanding regarding the life histories of all fish and invertebrate species that affect commercial fishing and aquaculture. The District shall support increased outreach to assure that the increased understanding is communicated to fishers, resource users, and decision-makers at all levels.

Discussion: The District will support research activities concerning commercially or recreationally important fish species that are found in Humboldt Bay, particularly research and educational efforts by U.C. Cooperative Extension's Sea Grant program and Humboldt State University. The District will also support research and educational programs with state and federal agencies, and efforts by private individuals and corporations. The District will assist in distributing and publicizing the results of this research and identifying the implications for managing Humboldt Bay.

HFA-8: Identify and implement the requirements for Bay management with respect to Essential Fish Habitat

Policy: The District will assist the Pacific Fisheries Management Council and NOAA Fisheries in identifying Essential Fish Habitat (EFH) in Humboldt Bay, and in integrating the EFH elements into the Management Plan and its long-term implementation.

Discussion: The Federal Magnuson-Stevens Fisheries Conservation Management Act sets forth mandates for NOAA Fisheries, regional fishery management councils, and federal action agencies to identify and protect important marine and anadromous fish habitat. The Councils, along with NOAA Fisheries, must identify Essential Fish Habitat in fishery management plans for all managed species. The PFMC must also consult with those undertaking activities that could affect these species or the habitats in order to help them avoid or minimize impacts to the habitats and, where possible, to foster enhancement of degraded habitats.

The District will work cooperatively with NOAA Fisheries and other agencies to identify Essential Fish Habitat, and to reduce adverse impacts to the habitats of all managed species. The District will cooperate with research personnel to foster research needed to identify important habitat factors for the covered species in the Humboldt Bay ecosystem.

HFA-9: Develop agreement with the Wiyot Tribe to facilitate cultural resource management

Policy: The District will work collaboratively with the Wiyot Tribe to develop a mutual understanding of shared trust interests, including but not necessarily limited to cultural resources and the avoidance or mitigation of potential impacts under the authority or control of the District.. The District will seek to develop a memorandum of understanding with the Tribe, which may address matters pertaining to cultural resource protection, use of Native American monitors during certain construction activities, and other matters of mutual interest.

Discussion: The District's trust role in managing Humboldt Bay's resources is established by state law. This policy expresses the District's desired relationship with the Wiyot Tribe, in which the District seeks to develop management approaches that are sensitive to the Tribe's concerns about the possible effects of plan implementation on cultural resources in the Humboldt Bay region.

HFA-10: Institute procedures to ensure compliance regarding cultural resources and related matters

Policy: In implementing this plan, the District shall ensure that project proponents comply with state law and regulations (including, but not limited to, CEQA and the CEQA Guidelines, and recommendations of the Native American Heritage Commission) with respect to identifying and mitigating potential effects on historical properties, archaeological sites, and human remains. The District shall consider the following procedures, as appropriate:

a. Contacting the affected or potentially affected tribal organizations
b. Contacting the North Coast office of the California Historic Resources Information Center to obtain a cultural resources record search
c. Conducting archaeological field investigations
d. Contacting the Native American Heritage Commission for a Sacred Lands file search
e. Including in construction plans and documents provisions to be followed in the event of an accidental discovery and, in areas of known cultural sensitivity, to arrange for the presence of a certified archaeologist and/or a culturally affiliated Native American Monitor
f. In cases where significant cultural resources are identified in project planning, consider avoidance as defined in CEQA Guidelines Section 15370

Discussion: This policy codifies within the Management Plan the recommended or required cultural resources protection practices currently recognized in California.

3.6 Toxic Materials Management

3.6.1 Goals and Objectives

The District supports a close coordination of local, state, federal, and private entities in order to enhance spill prevention and response, as well as the elimination of dumping and the accumulation of debris.

Goals

- Prevent spills in Humboldt Bay
- Minimize the impact of spills on Humboldt Bay
- Minimize water-borne debris in Humboldt Bay
- Eliminate illegal dumping

Objectives

- Spill response and cleanup procedures will be enhanced in Humboldt Bay through increased coordination among local, state, and federal agencies and personnel
- Planning measures and implementation procedures for spill prevention and response will continue to be improved
- The level of public involvement in, and knowledge about, the effects of illegal dumping on the Bay's environmental resources will be improved,

leading to reduced dumping, protecting water quality and environmental resources

- Compensation obtained through environmental resource damage assessments and potential penalties or fines will be applied to improving spill prevention and cleanup capabilities

3.6.2 Policies

HTM-1: Enhance public outreach and educational programs addressing the impacts of toxic materials to Humboldt Bay and surrounding lands, and assist in educational efforts to prevent toxic spills

Policy: The District shall work with the entities who are involved with spill prevention and management in Humboldt Bay to improve existing public outreach and information programs to inform members of the public and the staff and decision-makers of local, state, and federal agencies about the District's efforts to reduce or eliminate the introduction of toxic materials into the aquatic environment, including Humboldt Bay and the wetlands and streams in the watershed which drain to Humboldt Bay.

Discussion: Improved public education is needed that addresses the harm to Humboldt Bay and the Humboldt Bay watershed that is caused by the misuse of toxic materials, and the improper disposal of trash, in the Humboldt Bay watershed. The District will develop an educational and outreach program that addresses the harm to the aquatic environment that results from this pollution source. The District will support and promote the efforts of the Clean Boating Network. The District will consider sponsoring an annual event to clean up trash around Humboldt Bay. Where technically feasible, the District's program will identify methods for removing floating debris.

HTM-2: Monitor, comply with, and assist in updating as necessary the oil spill contingency plans for Humboldt Bay

Policy: The District shall take appropriate measures to ensure that activities subject to District jurisdiction comply fully with oil spill contingency plan requirements of the Office of Spill Prevention and Response, the U. S. Coast Guard, and other appropriate organizations. The District shall actively collaborate in reviewing and updating the relevant plans.

Discussion: The District will maintain and update periodically the inventory and map of environmentally sensitive and economically significant areas in and adjacent to Humboldt Bay. The District will assist in periodically reviewing the Environmental Sensitivity Index, existing agreements, contacts, response phone numbers, and documents such as the County of Humboldt Emergency Operational Plan Annex A, County of Humboldt Area Plan for Hazardous Materials Plan. The District will assist other responsible agencies in evaluating various response scenarios, ranging from small spills to catastrophic spills. The District will assist in updating the plan to include care for injured wildlife. The District will seek to assure that adequate containment materials and equipment are available to address the full range of spill circumstances that may occur in Humboldt Bay.

HTM-3: Assure compliance with North Coast Air Quality Management District Rules for Particulates

Policy: The District shall assure that activities subject to District jurisdiction incorporate affirmative actions to assure compliance with AQMD Rule 420 (Particulate Matter) and Rule 430 (Fugitive Dust Emissions), or succeeding AQMD rules that carry out the AQMD's management program for particulate matter.

Discussion: The North Coast Unified Air Quality Management District is a regulatory agency charged with assuring compliance with federal and state air quality law and regulations. The AQMD has adopted plans that address the region's air quality. The District is a responsible agency with respect to this issue, and this policy directs the District to "pass through" the need for compliance with adopted AQMD plans and policies.

HTM-4: Projects shall incorporate appropriate odor-control measures

Policy: The District shall adopt a standard for projects subject to District jurisdiction that approved projects shall not produce nuisance levels of odors. The

District shall require that projects that may be associated with odoriferous emissions adopt feasible mitigation measures to avoid or reduce the odors.

Discussion: This policy directs the District to address the potential for proposals considered by the District to result in odors, and to include odor-reduction measures in CEQA reviews and permits for projects approved by the District.

3.7 Regulatory Streamlining

The District seeks to coordinate and simplify the regulatory processes affecting management actions and appropriate development proposals in Humboldt Bay. The District would like to consolidate permit forms, requirements, and review processes, for projects affecting fill placement, maintenance dredging, culvert/tidegate replacement, and other harbor-related management or development activities, while maintaining full environmental protection.

3.7.1 Goals and Objectives

Goals

- A consolidated regulatory review process that meets the requirements of local, state, and federal agencies, which shortens and simplifies the time and effort levels needed in order to accomplish desirable harbor-related projects

Objectives

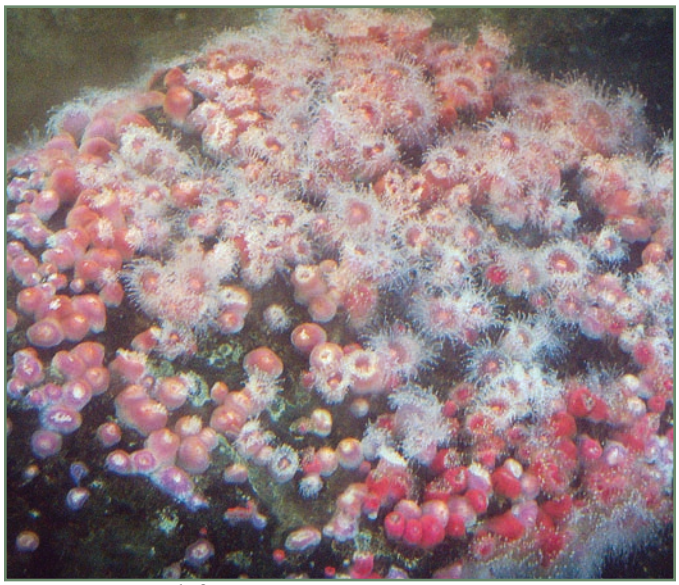
- Develop a consolidated application process that allows the District to accept applications that meet the submittal requirements of other agencies
- Reduce redundancy in application forms and submittal requirements, and reduce the time and effort necessary to complete applications for the several approval agencies
- Increase the level of coordination among regulatory agencies, reducing delays that affect desirable harbor-related projects

3.7.2 Policies

HRS-1: Develop and implement a regulatory coordination process for projects around Humboldt Bay that are consistent with adopted plans

Policy: Working collaboratively with regulatory agencies having responsibilities for the Humboldt Bay watershed, the District shall seek to develop a review process for harbor, shoreline, and other physical management elements that consolidates federal, state, and local requirements for applications and environmental documentation. The primary focus of this program shall be to coordinate, combine, and simplify the processes associated with applying for harbor-maintenance projects in Humboldt Bay.

Discussion: The District desires to simplify and unify the processes that applicants must follow for proposals that involve dock construction, fill placement, maintenance dredging, culvert/tidegate replacement, and other activities in or adjacent to Humboldt Bay that are subject to the District's jurisdiction. The District seeks to develop a combined review process for proposals that are consistent with adopted planning documents and other legal requirements that could streamline regulatory reviews. Ideally, an applicant could submit one application to the District that would result in shortened, combined review processes that included other agency approvals. To accomplish this goal the District would develop an application format that addresses requirements of all of the regulatory agencies. Ideally the District would like to develop a process that achieves regulatory consistency among agencies reviewing harbor-related applications, in terms of information needs, submittal requirements, impact assessments, mitigation requirements, and conditions of approval.



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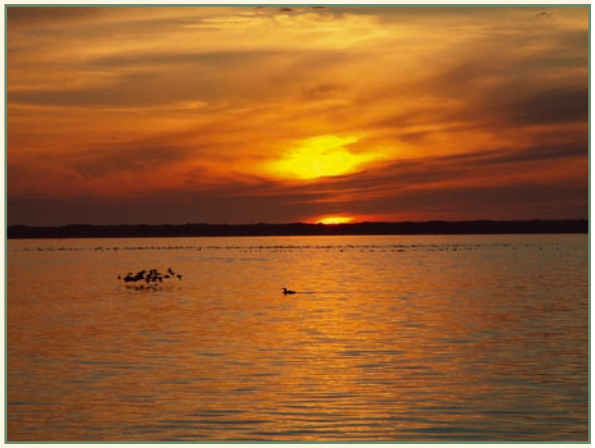
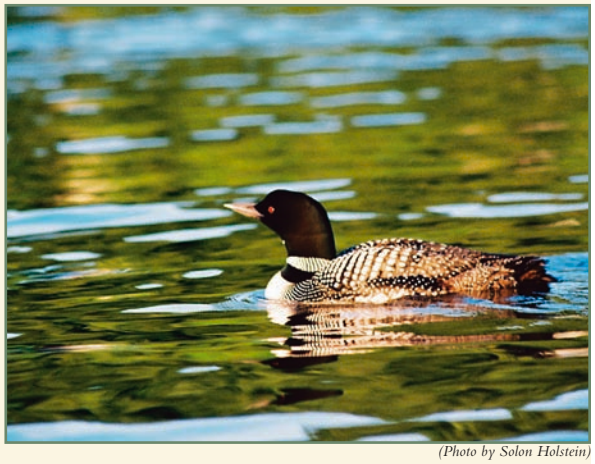




(Photo by Solon Holstein)

RECREATION POLICIES

Recreation Element Planning Policies

Chapter 4.0

4.1 Chapter Overview

This chapter of the Management Plan sets forth the District's policies with respect to recreation management within the District's jurisdictional areas, in and around Humboldt Bay. Policies are arranged by categories pertaining to:

- Recreation Administration (Policies RA-1 through RA-4)
- Planning for Recreational Opportunities (Policies ROP-1 through ROP-4)
- Developing Recreation Facilities and Access Improvements (Policies RFA-1 through RFA-11)
- Specific Recreation Activities (Policies RSA-1 through RSA-9)
- Interpretation and Public Outreach (Policies RIO-1 through RIO-4)
- Visual Resources and Scenic Views (Policies RVR-1 through RVR-7)

As in other chapters in Section III, these policies are meant to be applied as an overall set of guidelines and within specific contexts, not singularly or in isolation. "Recreation" policies in this chapter must also be considered in conjunction with harbor and conservation policies that are identified in other parts of this document, given that the Public Trust incorporates uses in all of these categories.

Generally, the policies in this chapter are intended to promote the District's leadership in the creation, enhancement, and management of recreation resources associated with Humboldt Bay. The general goal is to maintain and enhance diverse recreational uses of Humboldt Bay and, as stated in the District's Strategic Plan, to facilitate a substantial increase in recreational facilities available throughout the Bay area.

These policies are intended to provide guidance in terms of the District's role in ensuring the availability of appropriate and sufficient public outdoor recreation opportunities. Outdoor recreation activities can only occur if there are appropriate places for them. Many segments of the population depend upon public agencies to provide public lands for recreation.

Humboldt State University Crew team and tall ship

Clamming is popular during low tides
(Photo by Dan Yoshimoto)

Sailboards on Humboldt Bay

In reviewing comments received by the District pertaining to the preliminary March 2005 HBMP draft, the District noted suggested policies related to the management of recreational and aesthetic resources. One suggestion has been incorporated as an additional policy:

- The District generally accepts the recommendations for signage associated with recreational access and interpretation that are included in the Humboldt Bay Interpretive Signing Program and *Interpretive Signing Manual* as suggested design guides for public interpretive signs and displays, and recommends the use of these materials as guidance in applications submitted to the District, in order to maintain consistency in interpretive programs around the Bay.

Additional suggestions that the District add elements to this chapter adopting a stronger policy focus for protecting visual and aesthetic resources were considered by District decision-makers to be unnecessary, since these concerns are addressed adequately by policies already included in the HBMP; additional policies regarding aesthetic values are not included in this chapter. One policy area was identified that the District's decision-makers considered as meriting additional consideration with respect to future policy development:

- The District is aware that billboards affect the appreciation of visual and aesthetic values associated with Humboldt Bay. The District will not adopt a policy with respect to existing billboards at the present time, but the District will consider the appropriateness of developing a policy for future implementation that regulates the placement of additional billboards in areas subject to District jurisdiction.

The recreation policies in this plan are meant to create, maintain, and enhance recreational opportunities for all constituents through a range of activities available in appropriate areas of the Bay. The policies acknowledge public outdoor recreation as an important component of the District's overall management of Humboldt Bay; recreational uses of Public Trust lands and waters are explicitly recognized in the District's authorizing legislation, as well as in established management doctrines for tidelands in California. The policies are also intended to promote coordination with other recreation providers. The policies support the dedication of specific areas, corridors, and access points for public outdoor recreation, and they are intended to foster an increase in recreational opportunities and facilities associated with Humboldt Bay. As in other District management functions, an important overriding theme is an emphasis on compatible uses and public safety.

4.2 Recreation Administration

4.2.1 Goals and Objectives

Goals

- Maintain and enhance diverse recreational uses of Humboldt Bay and facilitate a substantial increase in recreational facilities available throughout the Bay area
- Establish the District as the leader in creating and coordinating opportunities for outdoor recreational opportunities on Humboldt Bay by being responsive to all Bay users, constituencies, and stakeholders in the Humboldt Bay area

Objectives

- Create mechanisms for meaningful public and stakeholder participation
- Work cooperatively with the public and other recreation providers in creating, maintaining, and enhancing public, outdoor recreational opportunities on the waters and shorelines of Humboldt Bay
- Integrate recreational use considerations into other components of District management to the greatest extent possible

4.2.2 Policies (Recreation Administration)

RA-1: Humboldt Bay Management Plan Advisory Committee as a forum for recreation opportunities

Policy: The District shall establish a standing committee, called Humboldt Bay Management Plan Advisory Committee (HBMPAC). The HBMPAC

will be overseen by two members of the Board of Commissioners of the District. The HBMPAC will be staffed by the District's Director of Conservation. The HBMPAC will meet at intervals to consider the implementation of the Humboldt Bay Management Plan, and to recommend appropriate additional policies or alterations in existing policies with respect to the recreational opportunities, areas, and facilities of Humboldt Bay. The HBMPAC will be strictly volunteer and advisory in nature. HBMPAC members will be appointed by the Board of Commissioners and the HBMPAC members will serve at the pleasure of the District's Board of Commissioners.

Discussion: This policy, like similar policies in the Harbor and Conservation chapters, supports and institutionalizes the ongoing participation by those who directly or indirectly have a stake in public outdoor recreation on and adjacent to Humboldt Bay.

RA-2: Partnerships with other recreation providers

Policy: In all activities involving the planning, creation, improvement, maintenance, or enhancement of public outdoor recreation opportunities, the District shall consider and, to the extent feasible, seek the involvement of public and private partners. The District shall work with other recreation providers in any manner that may bring about positive results in terms of achieving recreation and access goals, including by:

a. Serving as the project or program advocate and main proponent.
b. Serving as the lead or a cooperating applicant for state or federal funding.
c. Serving as the lead agency or a participating agency for studies, needs assessments, user surveys, program plans, and other planning and implementation efforts directed toward improving public outdoor recreation opportunities and access on and adjacent to Humboldt Bay.
d. Serving as the lead agency or a cooperating agency for environmental reviews of recreation-related development projects.

Discussion: This policy institutionalizes approaches that the District has to some extent already been practicing. Partnerships are essential in the current regulatory and fiscal climate; leveraging funding through grant application partnerships is particularly important.

RA-3: Recreation opportunities to be integrated with other District functions

Policy: In the review of all proposals before the District, opportunities for enhancing public outdoor recreation and access shall be considered.

Discussion: In reviews of proposals and projects where the primary objectives pertain to harbor or conservation actions, the District should seek to integrate access and public recreation components where possible, feasible, acceptable for public safety, and protective of the primary uses.

RA-4: Capital improvement program and recreation budgeting

Policy: As a normal part of the District's budget development and adoption process, identify capital improvement line items and related cost estimates, as appropriate, for outdoor recreation and access-related acquisition, maintenance, and improvement projects, planning studies, and programs.

Discussion: This policy promotes another method for the District to consider, incorporate, and track its activities and costs related to its functions as a recreation infrastructure provider. It also demonstrates to interested parties the District's ongoing commitment to maintain and improve public outdoor recreation opportunities on Humboldt Bay.

4.3 Planning for Recreational Opportunities

4.3.1 Goals and Objectives

Goals

- Increase safe and appropriate recreational use on and adjacent to the Bay; promote the safe and responsible use of Humboldt Bay as a recreational resource, while minimizing potential conflicts among stakeholder and user groups, and while avoiding significant adverse effects to environmental resources

- Ensure through appropriate planning activities that adequate, dedicated areas of Humboldt Bay for recreational opportunities are available to meet the needs of current and projected users

Objectives

- Achieve overall increases over time in the number of safe and appropriate access locations and recreational opportunities within the District's areas of jurisdiction
- Increase safe and appropriate recreational use of Bay waters
- Plan for future public outdoor recreational uses and facilities to meet projected needs

4.3.2 Policies (Recreation – Opportunities Planning)

ROP-1: Recreation planning to be an ongoing and coordinated function

Policy: The District shall consult with other land management agencies in the Humboldt Bay region, and with the interested public, to develop plans and programs that reflect adequate and appropriate access to, and recreational use of, Humboldt Bay.

Discussion: In general, this is already an ongoing practice of the District, as evidenced by the development of this management plan. The District should actively seek input from stakeholder groups on an ongoing and coordinated basis.

ROP-2: Needs assessment and related use preference data

Policy: The District, in conjunction with other recreational services providers, stakeholders, and interested parties, should conduct or commission an assessment of projected recreation needs for Humboldt Bay, with a main focus on public outdoor recreational needs and preferences within the District's area of primary jurisdiction.

Discussion: Recreational user needs and preference data is needed to support selection of priority recreation projects and programs.

ROP-3: Identification of designated recreational use areas

Policy: The District shall designate, or otherwise identify and make available to the public, specific areas, corridors, and (coordinated with adjacent upland land uses) access points on the Bay for outdoor recreational use, particularly recreational uses that are water-oriented, as well as the related access, in areas of the Bay where such uses:

a. would not adversely affect, or be adversely affected by, commercial and industrial navigation and commerce; or

b. would not adversely affect sensitive cultural areas or areas managed for environmental resource values.

Public lands and other areas designated for recreational uses shall be depicted on a recreation and access resources map or maps maintained by the District and made available to the public, provided that recreational uses shall not be designated or mapped when doing so would clearly result in adverse public safety effects or adverse impacts on valued natural or environmental resources.

Discussion: This policy is intended to help protect public safety, reduce potential conflicts with commercial and industrial Bay uses, and reduce or avoid adverse effects to sensitive environmental resources by identifying appropriate areas for recreational use. The designated areas may include subregions of the Bay, corridors, or water trails that can be delineated on maps that can be posted on the District's website, displayed in public locations, and supplied (at a cost sufficient to recover production expenses) in printed materials to recreational users.

ROP-4: Future recreation areas to be reserved as needed

Policy: So that development of recreational facilities may proceed in accordance with recreational demand over time, the District shall acquire or otherwise reserve, as appropriate, Bay islands and lands, tidelands, waterfront areas, and access points within the District's control that are likely to be needed in the future for recreational areas, access points, piers, parks, beaches, and related uses.

Discussion: Within the District's mission and authority, it is appropriate to acquire additional properties for recreational uses and access to meet

expected recreational and access demand. Properties may be acquired and held for future uses currently not identified. This policy is supported by Coastal Act section 30223.

4.4 Developing Recreation Facilities and Access Improvements

4.4.1 Goals and Objectives

Goals:

- Develop and promote development of recreation facilities and access improvements that meet the needs of current and future recreational users, stimulate the local economies, and enhance the quality of life in the Humboldt Bay area

Objectives:

- Provide adequate facilities for recreational use of and access to Humboldt Bay
- Integrate recreation and public access improvements into other development activities of the District, where appropriate
- Assist other agencies in identifying and protecting public access points and recreation-related land uses in Humboldt Bay, and in developing related capabilities
- Enhance public access and use of the Bay's waters and shoreline, as appropriate and consistent with other goals and policies of this plan
- Enhance opportunities for visitors and Humboldt County residents to enjoy and safely access Humboldt Bay
- Reduce user conflicts in Humboldt Bay

4.4.2 Policies (Recreational Facilities & Access)

RFA-1: Safe and appropriate public recreational access to and use of the Bay

Policy: The District shall endeavor to retain and protect existing public access points, and support the development of new access points, that promote safe and appropriate public recreational access to the Bay.

Discussion: Consistent with the Coastal Act and responsive to expressed preferences of a number of stakeholders, this policy supports efforts by the District to maintain and increase safe and appropriate access to the Bay.

RFA-2: Project approvals shall incorporate public access and associated services and amenities where appropriate

Policy: Projects approved by the District shall require the provision of appropriate public access and related services and amenities, if feasible, including viewing areas, restrooms, public parking, visual access, and access facility maintenance, to the extent that such access and amenities:

a. are consistent with the protection of environmentally sensitive areas;

b. do not result in exposing visitors to hazardous conditions associated with coastal-dependent uses authorized by the project approval; or

c. do not expose the approved project or use to undue risk from the presence of visitors.

Discussion: This policy essentially reflects the requirements of the Coastal Act (sections 30210 to 30214, generally); it is intended to promote integration of access into other District functions, consistent with other policies in this plan. As a practical matter, this policy also recognizes that, where people gather, related public amenities and services should be provided, if feasible.

RFA-3: Water-oriented recreation facilities; access for fishing and shellfish harvesting

Policy: The District shall provide, cause to be provided, or support the provision by others of improved and new water-oriented recreation facilities, including but not limited to marinas, launch ramps, pumpout stations, fish-cleaning stations, beaches, artificial reefs, native clam stocking programs, and fishing piers, to the extent possible and feasible to meet current and projected recreational needs. The District shall provide adequate access and facilities for recreational fishing and shellfish harvesting, which should include shoreline access, fishing vessel amenities, and pier fishing in Humboldt Bay, where appropriate. The District should encourage and allow such additional recreational facilities and access improvements on the Bay, provided that such uses:

a. do not preempt land or water areas needed for other priority uses,
b. are feasible from engineering and financing viewpoints, and
c. do not have significant adverse effects on water quality, cultural resources, environmentally sensitive resources, or other aspects of the environment.

Discussion: The Coastal Act encourages increased boating use on coastal waters and recognizes the need for associated facilities. Water-oriented facility development is a functional area for which District leadership is well-suited. Similar to other policies, this policy recognizes that partnerships with other recreation providers likely will be needed to carry out these objectives. (See also Policy RA-2.)

RFA-4: Coastal-dependent industrial and commercial uses may take priority in designated Harbor areas

Policy: Where conflicts occur or could potentially occur between recreational uses and coastal-dependent industrial or commercial uses of the harbor, the District shall make reasonable efforts to integrate recreation into such facilities to the extent that the uses are compatible and protective of public health and safety; however, coastal-dependent commercial and industrial uses may be approved in designated Harbor areas without recreational use components, based on written findings by the District that such recreational uses would be unsafe or otherwise incompatible with the primary, industrial or commercial use.

Discussion: While in many cases recreation and public access functions can be incorporated into development projects, this policy recognizes that, in a limited number of cases, public recreation and access may not be appropriate. The policy requires written findings so that the District's rationale for such decision can be available for public information and comment.

RFA-5: Environmentally and culturally sensitive areas

Policy: Public access to environmentally and culturally sensitive areas may be provided to permit study and enjoyment of these areas. Public access to environmentally and culturally sensitive habitats and conservation areas also may be restricted or prohibited, based on recommendations from agencies with jurisdiction by expertise or law or from Native American representatives; specific locations and types of access shall be evaluated in consultation with those agencies and representatives.

Discussion: This policy supports a range of actions by the District with respect to recreation and other uses within environmentally sensitive areas; it also promotes coordination with other resource agencies with respect to technical advice on appropriate levels of public access to environmentally sensitive areas.

RFA-6: Prevention of significant adverse environmental effects

Policy: Water-oriented recreational facilities, including marinas, fishing piers, boat launch facilities, parks, and beaches, shall be sited, designed, and managed to be compatible with environmental values and to prevent significant adverse effects on environmental resources and cultural resources.

Discussion: This policy reflects generally the requirements of the California Environmental Quality Act and the Coastal Act.

RFA-7: Protection of recreational areas

Policy: Sites, features, or facilities within water areas, waterfront recreational areas, access points, and other areas or corridors within the District's control that provide or could provide high-quality conditions for water-oriented recreational uses should be preserved and, where appropriate, enhanced for those uses, consistent with natural and cultural resource preservation needs and other provisions of this plan.

Discussion: This policy, in combination with other policies in the chapter, supports actions by the District to protect and preserve the most suitable recreational areas for appropriate recreational uses.

RFA-8: Minor amounts of fill authorized

Policy: To increase recreational opportunities and access in and around Humboldt Bay, the District may authorize the placement of minor amounts of fill in order to develop or enhance public recreation

opportunities and access to the Bay. Small amounts of Bay filling may be allowed for shoreline parks, recreational areas, and other recreational and access uses that provide substantial public benefits, where such improvements cannot be developed without some filling. The allowed fill must be the minimum quantity required to develop the project, and the District shall require that the proposed use be the least environmentally damaging feasible alternative that accomplishes the proposed purposes. The authorization shall be contingent upon the performance of appropriate environmental analyses and the resulting findings, and upon consultation with the relevant federal, state, and local agencies.

Discussion: Similar to policies in other chapters of this Plan section, this policy authorizes limited fill if necessary for recreational uses and public access, subject to specified analyses and findings. This provision follows from the Coastal Act, Section 30705. (See Policy HWM-3 in Chapter 3.0)

RFA-9: Support public transportation

Policy: The District shall support the provision and use of public transportation, including, as appropriate, buses, water ferries, bicycle routes, and other services and facilities that accommodate public transit to and among shoreline access points, marinas, urban waterfronts, and other recreation areas, access points, and parks. The District, in conjunction with other local government agencies, shall promote alternative transportation access from urban areas to major destinations on and around the Bay, including, but not limited to, Woodley Island Marina.

Discussion: While addressing a functional area not always within the District's primary area of jurisdiction, this policy supports public transit and other possible, future modes of alternative transportation. It is generally consistent with local plans, the Coastal Act, and other state and federal programs promoting multi-modal transportation.

RFA-10: Signage and parking for public recreation areas, access points, and trails

Policy: The District shall require or support others in requiring clear and appropriated signage and public parking for all public recreation and access projects. Access to the Bay and to recreation facilities shall be designated clearly, and shall be easily available from parking reserved for the public or from public streets.

Discussion: Signage and public parking are essential auxiliary components to public access; this policy recognizes that the District may have occasion to require, or support other agencies in requiring signage and public parking as part of project approvals. (See also Policy RIO-4.)

RFA-11: Signage for boating safety

Policy: The District shall provide, or cause to be provided by working cooperatively with other agencies, signs and other information regarding shipping lanes, U.S. Coast Guard rules for navigation, and safety guidelines for smaller recreational craft, at marinas, boat ramps, launch areas, personal watercraft and recreational vessel rental establishments, and other recreational water craft use areas. (See also Policy RIO-4.)

Discussion: This policy supports recreation safety in boating on the Bay.

4.5 Additional Policies for Specific Recreation-Related Activities

4.5.1 Goals and Objectives

Goals

- To assure an adequate supply of certain types of recreational facilities on and around the Bay within areas under the District's control to meet current and projected recreational user demands
- To assure recreational facilities and associated uses are compatible with overall Bay management

Objectives

- Provide, or cause to be provided, needed or desired public facilities and other opportunities for appropriate recreational activities on the Bay
- Minimize potential conflicts among various uses of Bay waters and shoreline areas
- Promote public safety

4.5.2 Policies (Recreation – Specific Activities)

RSA-1: Improvement and provision of boat launch sites

Policy: The District shall seek to provide, and support other public agencies in providing, boat launch sites throughout the Bay, as determined by a needs and feasibility assessment. Additional boat launch sites shall be considered; however, improvement of existing boat launch sites should generally be a higher priority than construction of new, additional sites with similar functions. Public launching facilities for a variety of motorized and non-motorized boats and other water-oriented recreational craft, such as kayaks, canoes and sailboards, should be provided in designated recreational areas, where feasible.

Discussion: Public input has indicated that additional boat launching sites are a high priority for recreation on the Bay.

RSA-2: Assistance to, maintenance of, and consideration of marinas

Policy: The District shall assist existing public and private marinas, and shall encourage marina development and improvement as appropriate, based on needs assessments and other policies in this plan. Assistance to marinas may include, but is not limited to, channel and basin dredging, shoreline protection, and improvements for public safety. Assistance also includes application for grants from other agencies that can be applied to recreation improvements at marinas.

Fill may be permitted for marina facilities that must be in or over the Bay, such as breakwaters, shoreline protection, boat slips, ramps, pilings, launching facilities, pumpout and fuel docks, and short-term unloading areas, subject to compliance with other policies in this management plan.

No new marina or any expansion of an existing marina shall be approved unless water quality will be adequately protected and an adequate number of vessel sewage pumpout facilities that are convenient in location and time of operation to recreational boat users are provided, as well as receptacles to dispose of waste oil and oily bilge water.

Discussion: Marina siting and development are among the primary authorized actions that the District may take. Maintaining or improving existing marinas, as well as creating new marinas, is subject to the regulations of the Coastal Commission and the U. S. Army Corps of Engineers, and the District may be limited in its assistance to marina owners or the developers of new marinas unless the requirements of these agencies, and the laws they implement, are met. (See Policy HWM-3 in Chapter 3.0)

RSA-3: Considerations for live-aboard boats

Policy: The District shall consider, and may adopt, a policy, program, or ordinance that addresses live-aboard boats in marinas in Humboldt Bay, including their potential capability for increasing the recreational opportunities in the Bay, their potential for interfering with commercial marina uses, possible use to provide security and water safety functions, and their potential for creating adverse environmental effects.

Discussion: This policy, which anticipates and makes provision for the need by the District to regulate the use of boats as residences, recognizes both beneficial and potentially adverse issues.

RSA-4: Anchorage, security, and disposition of recreational boats

Policy: Anchoring or mooring a recreational boat or watercraft in Humboldt Bay is a privilege granted by the District. The District may act in the public interest to enforce adopted provisions pertaining to abandoned boats and watercraft.

Discussion: This policy, implemented in the District's Ordinance 17, recognizes that the District has the authority to regulate the anchoring, docking, mooring of all boats in Humboldt Bay, including recreational boats, and that, on occasion, the District may also need to take actions to remove a leaking, sunk, or abandoned watercraft.

RSA-5: Support opportunities for recreational fishing

Policy: The District shall support the use of appropriate locations, including shoreside, tideland, and those accessible only by boat, for public fishing or shellfishing activities, subject to compliance with other policies in this management plan.

Discussion: This policy is a statement of the public's right of access to Public Trust lands for fishing purposes.

RSA-6: Protect District-owned beaches for visitor-serving uses

Policy: The District shall protect, preserve, and enhance sandy beaches under the District's jurisdiction for recreation and visitor-serving use, consistent with the maintenance or protection of environmentally sensitive resources.

Discussion: Beaches on the Bay are a relatively rare commodity, and this policy supports the protection of such areas that are now or may in the future be under District control or authority.

RSA-7: Prohibition of off-highway vehicles on District-controlled properties

Policy: The District shall prohibit the use of off-highway vehicles (OHV) for recreational use on properties and areas owned or otherwise controlled by the District, unless those properties are/were specifically acquired and developed for OHV use, or unless the OHV use is necessary in order to carry out water-dependent or coastal-dependent activities.

Discussion: This policy expands an existing District ordinance (Ordinance No. 11) for the District's property at King Salmon. Recreational OHV use is not feasible on most areas within the District's direct jurisdiction and is incompatible with other forms of recreation, other uses, and with environmental protection requirements.

RSA-8: Use of concessionaires

Policy: The District may approve the provision of services by concessionaires.

Discussion: This policy recognizes that the supplemental services provided by existing concessionaires or potentially provided by future concessionaires have value and should be allowed where such services will enhance public outdoor recreational experiences on the Bay.

RSA-9: Support for a water trails program for Humboldt Bay

Policy: The District, in cooperation with other public agencies and interested parties, shall assess and, if feasible, designate a trail or trails on Bay waters for use by kayaks, canoes, and similar small craft. Such routes, which should be focused primarily in the Arcata Bay and South Bay, shall be depicted on District maps and in other public information. The program shall incorporate necessary signage, safety, and environmental protection provisions.

Discussion: The District has the primary authority for water-oriented uses on the Bay. A water trails program, as suggested by local a non-profit group and others, is a reasonable public recreational use of Humboldt Bay, subject to other policies in this plan. The concept should be carried forward and, if found to be feasible, implemented. The focus on the North Bay and South Bay is intended to avoid designating an "official" water trail crossing the bay entrance, for safety reasons. As with other recreational activities, a successful water trails program should promote boating safety and environmentally sound boating practices.

4.6 Interpretation and Public Outreach

4.6.1 Goals and Objectives

Goals:

- Enhance the understanding and appreciation for Humboldt Bay and its resources by the public and area decision-makers

Objectives:

- Enhance the knowledge base in the local community about Humboldt Bay
- Increase public awareness about Humboldt Bay and about the District
- Enhance recreational activities by incorporating an educational component

4.6.2 Policies (Recreation—Interpretation & Outreach)

RIO-1: Interpretive program

Policy: The District shall develop, or participate in the development by other agencies and non-profit organizations of, an interpretive program that identifies

the environmental resources, port-related functions, public access and recreational resources, and the cultural history of Humboldt Bay.

Discussion: Interpretation is a key element in public enjoyment of recreational activities, and the associated public education aids resource stewardship. The District benefits from interpretive program development by other parties.

RIO-2: Public interpretive center

Policy: In conjunction with other local agencies and interested parties, the District shall support the planning, siting, and, if feasible, the development of a public interpretive center in the central part of the Humboldt Bay region for interpreting the natural, cultural, and socioeconomic features of the region. This interpretive center would be intended to link with the interpretive centers at the Arcata Marsh and Wildlife Sanctuary (in Arcata Bay) and the Humboldt Bay National Wildlife Refuge (in South Bay) to form a Humboldt Bay interpretive system, where each center's theme would be unique, yet tied together through common Bay-wide issues and signage. The District's support shall take the form of sponsorship, together with the cities and other agencies, as well as in the form of soliciting funding and appropriate approvals from relevant local, state, and federal agencies.

Discussion: This policy is consistent with a recommendation in the Humboldt Bay Strategic Plan to develop an interpretive center. The policy is also generally consistent with recommendations in the Humboldt Bay Harbor Revitalization Plan, which recommended the development of a major visitor-serving facility (such as an aquarium, including an interpretive center) near Humboldt Bay in the City of Eureka.

RIO-3: Directing recreational users toward appropriate areas of the bay

Policy: The District shall encourage visitors to visit and use designated recreational areas and shall actively discourage visitor use of sites designated for environmental resource conservation, protection of sensitive cultural resource activities or sites, or potentially dangerous coastal-dependent uses.

Discussion: Similar to RP-2 above, this policy seeks to protect public safety and reduce potentially adverse environmental effects, including those associated with human intrusions into sensitive habitat areas.

RIO-4: Support for consistency in interpretive signs and displays.

Policy: The District shall encourage the use of the Humboldt Bay Interpretive Signing Program and Interpretive Signing Manual as suggested design guides for public interpretive signs and displays around the Bay.

Discussion: The Signing Program and Manual was developed by the Redwood Community Action Agency with participation by land managers and other entities in the Humboldt Bay Area, including the District. While the District is not proposing to formally adopt this program as part of this Management Plan, this policy reflects the District's intent to encourage the use of the Interpretive Signing Program in order to promote consistency, quality, and possible cost savings in interpretive signs and displays.

4.7 Visual Resources and Scenic Views

4.7.1 Goals and Objectives

Goals:

- Maintain and enhance the visual character of the Humboldt Bay

Objectives:

- Avoid visual blight or unsightly views at sites under the District's jurisdiction
- Provide views of Humboldt Bay as a requirement for projects approved by the District

4.7.2 Policies (Recreation – Visual Resources)

RVR-1: Views of Humboldt Bay shall be protected

Policy: In approving proposals before the District, the District shall require that existing views of Humboldt Bay be protected, and that enhanced views of the Bay and its shoreline be provided whenever it is feasible to do so.

Discussion: This policy is consistent with intent of the Coastal Act, which states (section 30251) that permitted development shall be sited and designed to protect views to and along the Bay, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas.

RVR-2: Coastal-dependent uses shall facilitate public viewing, if feasible

Policy: To enhance the maritime atmosphere of the Bay, marine facilities, docks, and other facilities serving coastal-dependent uses shall be designed, whenever feasible, to permit public access and viewing of port-related activities by means of:

a. view points (e.g., piers, platforms, or towers), restaurants, etc., that would not interfere with harbor operations, and

b. openings between buildings and other site designs that permit views from nearby roads.

Discussion: Public access involves both physical access and visual access. Other policies in this chapter encourage incorporation of recreational uses in projects, while allowing for cases where public access may be prohibited for safety or compatibility reasons. This policy supports the Coastal Act policies that: development should not interfere with access (Section 30211), scenic views should be protected (Section 30251), and agencies should generally provide for "maximum" access (Section 30210).

RVR-3: Scenic views and vistas map

Policy: The District should develop, cause to be developed, or participate in the development of a Bay view plan or map that identifies vista points for Humboldt Bay. The scenic plan and map should include provisions for access to vista points by walkways, trails, or other appropriate means, and possible connections to nearby public roads where parking or public transportation is available.

Discussion: This map could be included in other interpretation materials and packages.

RVR-4: Trash and debris removal

Policy: The District shall promote the removal of trash or debris from the Bay, its tidal flats, its tributary sloughs, its marshes, and other areas, unless such debris can be demonstrated to be beneficial for the Bay ecosystem.

Discussion: This policy reflects part of the District's "Adopt-the-Bay" program.

RVR-5: Coordination with other jurisdictions on visual quality

Policy: In reviews of draft plans, proposed projects, and as otherwise may be appropriate, the District shall encourage local governments in the Humboldt Bay area to consider viewshed or vista-point impacts of developments considered by these governments, in order to maintain important scenic views of Humboldt Bay.

Discussion: Many views of the Bay and related viewshed issues, while potentially a consideration for the District, involve areas outside the District's direct authority and, thus, cooperation with other agencies would be appropriate.

RVR-6: Lighting shall meet federal and state guidelines

Policy: The District shall regulate the use of interior and external lighting in proposals that are subject to District approval. Proposed uses shall provide adequate lighting to assure public safety and welfare. However, the District shall identify proposed lighting uses that may be identified as adverse effects on the environment, pursuant to state and federal law. The District shall require mitigation of lighting impacts to the greatest extent feasible.

Discussion: Excessive lighting, particularly exterior lighting that is directed outside the boundaries of proposed projects, constitutes a significant adverse impact for many uses in open spaces such as Humboldt Bay. The District will consider the potential for adverse aesthetic impacts from extraneous or excessive lighting and shall require the incorporation of feasible mitigation measures to avoid, reduce or offset the aesthetic impacts.

RVR-7: District to consider future policy on billboard controls

Policy: The District shall investigate its responsibilities with respect to billboard management issues affecting the Humboldt Bay area, including regulatory and legal issues related to possible control measures. Based on this investigation, the District may develop, if appropriate, policy alternatives with respect to the future siting or construction of billboards in areas subject to the District's jurisdiction.

Discussion: To protect sensitive habitat and species, and to protect aesthetic and economic values, the management and control of billboards in tidelands subject to the District's jurisdiction may be appropriate, particularly with respect to billboards sited in Humboldt Bay's tidelands in the future. Currently, however, the District does not assert authority regarding billboard siting or management. Additional investigation and stakeholder involvement is required to identify possible legal issues, management alternatives, and appropriate strategies.

CONSERVATION POLICIES

(Photo by Solon Holstein)

Conservation Element Planning Policies

Chapter 5.0

5.1 Chapter Overview

The policies identified this chapter of the Management Plan represent the framework within which the District will address management programs and practices for the environmental resources covered by the Plan. The policies enunciated below provide the planning framework for the District's management approach to the Conservation-related elements of Humboldt Bay.[1]

The policies are intended to provide the essential or core guidance for District decision-making with respect to the environmental resources of Humboldt Bay. The policies are not intended to cover, in explicit detail, every circumstance that may arise in the course of the Bay's management, but are intended to provide guidance that will assist District decision-makers and staff, as well as people in other agencies and members of the public, in interacting with the District regarding the management of environmental resources in the Bay. In some cases, the policies provide standards that the District must meet in acting on its own proposed projects or those of applicants.

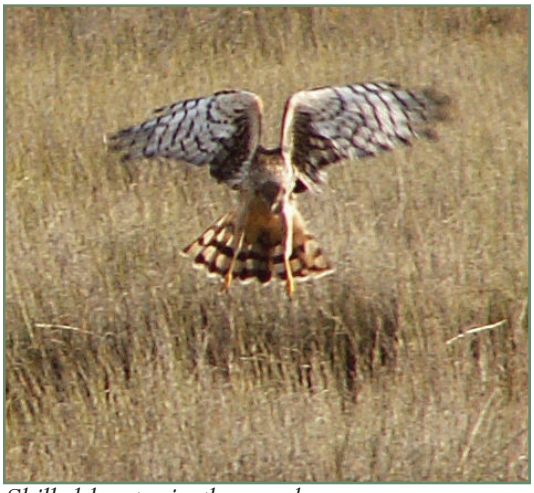
In a general sense, managing Humboldt Bay's aquatic ecosystem elements incorporates three components:

- stewarding existing ecological systems present in the Bay that support desired features, such as the availability of habitat, adequate water quality, and similar factors underlying the desired ecosystem elements;
- maintaining those systems as a part of the District's regulation of development proposals that fall under District jurisdiction; and
- restoring or enhancing specific elements of the aquatic ecosystems (and related terrestrial ecosystem elements, such as some riparian forestlands) as necessary to increase the level of ecological functions, services, or resources provided by Humboldt Bay.

These components are based upon an underlying District management approach, which includes the following elements:

[1] The Humboldt Bay Management Task Force convened by the District identified three desired focuses for this Plan chapter: (1) habitat protection and restoration, (2) species protection, and (3) wetland mitigation. These elements are incorporated within the policies identified in this chapter.

Gooseneck barnacles and mussels



Skilled hunter in the marsh

Dunes surrounding Humboldt Bay contain a wide variety of plants

Adaptive Management, in which the District will monitor the effects of its management, continue to seek additional information as time passes, and apply the monitoring results and the additional information to subsequent decisions, so that management approaches may be refined as knowledge about Humboldt Bay accumulates;

Sustainability, in which the District focuses on the long-term maintenance of both the environmental resources in Humboldt Bay and the ecological processes that maintain those resources, for the human and non-human residents of the Humboldt Bay region; and

Stewardship, in which the District, its tenants and applicants, and the other members of the Humboldt Bay community assume a responsibility for the well-being and the continuance of the Bay's environmental values and resources.

In order to accomplish this management direction, the District will rely upon the involvement of the people in the Humboldt Bay region, including members of the public as well as those who are directly involved in agency decision-making roles.

Procedurally, the policies in this chapter will function jointly with policies identified in the Harbor (Chapter 2.0) and Recreation (Chapter 3.0) chapters of Section III to provide direction for the District's decision-making. The legislation that established the District, in combination with the District's responsibilities under other elements of California law, requires that the District achieve a balance, for the benefit of all Californians, among its obligations to manage Humboldt Bay as a port and its obligations (shared with other local and state agencies) to manage the Coastal Zone's environmental resources. Some port-related uses (such as commercial fishing or mariculture) and some recreational uses (such as hunting, fishing, and shellfish harvesting) rely on the ecological productivity and resilience of the natural Humboldt Bay ecosystem, while at the same time reducing the standing crops of some native or desired non-native populations and potentially affecting the quality or the dynamics of the Bay ecosystem.

As noted in Chapter 1.0, the policies in this chapter constitute the primary policy focus for most of Arcata Bay and most of South Bay, because these two "bays" will be managed primarily for their environmental resource values. The policies in this chapter also apply within the Entrance Bay, although Entrance Bay will receive a substantial focus on port-related uses.

The District commonly works in conjunction with state and federal agencies that have regulatory or trust-agency authority over the environmental resources present in Humboldt Bay, including, among others, the U. S. Army Corps of Engineers, the U. S. Fish and Wildlife Service, the California Department of Fish & Game, and the California Coastal Commission (see Chapter 1.0). In addition the District works with other local agencies that share management authority over regions within the Bay, including the City of Arcata and the City of Eureka; the District also works collaboratively with those cities, and with the County of Humboldt, with respect to upland areas outside of the District's direct jurisdiction (see Chapter 1.0). The District works with non-governmental entities of several types, some having legally established privileges as a result of existing permits or leases, and others that reflect a variety of public sentiments about the appropriate management of the Humboldt Bay environment. As noted elsewhere in this Plan, the overlapping policies of these many agencies, and the variety of perspectives held by non-governmental entities, act as both guidelines and constraints for District management.

The District will endeavor to exceed a level of simple "compliance" with the requirements of other agencies in managing Humboldt Bay and its resources. The District's thrust in developing and implementing the policies in this chapter are focused on two essential stewardship tasks:

Maintaining and enhancing the viability of the ecological elements and the processes that support the Humboldt Bay ecosystem; and

Clearly indicating to applicants, decision-makers, agency staff, and citizens the direction of management, the acceptability of potential uses, and the requirements for the District's management programs.

In many cases, the identified policies require additional, future planning that is specific to the environmental resources of interest. No other approach is reasonable, given the intricacy of the Bay's ecosystem and the constantly increasing level of knowledge about the Bay's ecology. The detailed or specific plans that are developed as a result of the identified policies will reflect knowledge about the resources that is unavailable or inadequately integrated into decision-making today.

In reviewing public comments received during the preliminary review of the HBMP, the District identified policy areas in which additional deliberation by District decision-makers and staff, and discussion with other agencies and the public, may lead to the development of additional policies in the future. Three topical areas in which future District policy development may occur are among the Conservation-focused subjects covered in this chapter:

- A policy requirement that "native" species be used for projects considered by the District. The District currently favors the use of native species for landscaping purposes, but may approve applications that use non-native species when appropriate justification exists for doing so. The District would not normally approve the use of non-native species for restoration and/or enhancement programs in conservation-sensitive areas within the bay under any circumstances.
- The uses of the Bay for aquaculture and mariculture purposes, a topic that requires continuous balancing of importance between legitimate economic uses of Trust lands and possible effects on the natural ecological processes in the bay. This policy consideration is developed more fully in Chapter 3.0 above, but it should be noted that the development of additional policy options for mariculture likely would also be accompanied by additional Conservation-focused policies in this chapter.
- The incorporation of restored or enhanced wetlands that result from District management into "Mitigation Bank" processes. It is currently unclear how these considerations might affect the District's activities, and policy specification in the current version of the HBMP is considered premature.

In reviewing comments submitted by the public the District also noted policy suggestions that will not be adopted for the HBMP, three of which are explicitly related to this chapter:

- The Humboldt Bay Management Plan will continue to balance legitimate Trust uses of the Bay, and policy suggestions that would elevate "conservation" priorities above all other uses in all parts of Humboldt Bay will not be adopted. Specific suggestions that a policy regarding the incorporation of the concept of "carrying capacity," or the development of a policy framework based on "the precautionary principle," were judged by decision-makers as likely to result in an essential imbalance in the focus of management for the bay as a whole and are not adopted for the Plan.
- The restoration and/or enhancement of wetlands or related elements of the aquatic ecosystem in Humboldt Bay will continue to be a significant element in the District's management of Humboldt Bay, as described in section 4.5 of Chapter 4.0 in Section II. Restoration will not, however, be elevated to become an overriding concern in the District's management of the Bay.
- The District will continue to use the levels of environmental sensitivity identified under existing federal and state laws in identifying sensitive species and habitats for management purposes. While the District will continue to recognize additional levels of sensitivity (such as those identified by the California Native Plant Society) for environmental documentation purposes, the HBMP will not elevate locally rare species or habitats to the same status that is enjoyed by federally or state-listed species.

Compliance with the policies in this chapter will demonstrate to the citizens in the Humboldt Bay region, and to other agencies concerned with Humboldt Bay,

that the District continues to meet its obligations for managing the trust resources placed in its charge while also meeting the needs of the community to manage Humboldt Bay as a regional economic asset.

The policies in this chapter are arranged in the following categories:

- Maintaining Aquatic Ecosystem Functions (Policies CAE-1 through CAE-5)
- Aquatic Species Management (Policies CAS-1 through CAS-6)
- Humboldt Bay Ecosystem Management Program Elements (Policies CEP-1 through CEP-14)
- Public Involvement and Outreach (Policies CPE-1 through CPE-3)

5.2 Maintaining and Enhancing Aquatic Ecosystem Functions

5.2.1 Goals and Objectives

Goals:

- Protect and sustain the physical and biological environment maintaining the Humboldt Bay ecosystem
- Establish an open decision-making process regarding District management decisions

Objectives:

- Protect, maintain, and enhance the biological populations and processes in Humboldt Bay, in the nearshore Pacific Ocean, and in the Bay's watershed
- Protect and maintain the physical, chemical, and hydrological processes in Humboldt Bay, in the Pacific Ocean near the Bay, and in the Bay's watershed
- Develop working frameworks and plans for managing the Bay's environmental resources that incorporate the participation of other agencies and organizations

5.2.2 Policies

CAE-1: Base management decisions on maintaining the Humboldt Bay ecosystem, including the bay, the watershed, and the nearby ocean

Policy: The District shall actively focus its implementation of the Management Plan on protecting, maintaining, and enhancing the biological, physical, hydrological, and human-oriented characteristics of the Humboldt Bay ecosystem. The bay's ecosystem includes the bay's watershed and the nearby Pacific Ocean, and management actions that affect any part of this aquatic ecosystem complex may affect all parts of the ecosystem. Many bay uses only affect ecosystem processes and structural elements indirectly, but the Management Plan recognizes that effects on ecosystem processes and structural elements may be significant even if indirect or attenuated. Decisions regarding the bay's management shall incorporate the understanding that the integrity of the bay's ecosystem elements determines many of the values that are important to the bay's users.

Discussion: The District has adopted ecosystem-based management (often EBM) as an intrinsic focus for managing Humboldt Bay. EBM is a quasi-scientific management philosophy that incorporates the following elements:[2]

- **Partnerships and Citizen Participation**: Citizens, landowners, businesses, local governments, interest groups, and other parties work together to identify problems, opportunities, and solutions
- **Science-based Approach**: The best available scientific knowledge (social, economic, physical, and ecological) is the foundation for decision-making; environmental and ecological relationships and the sustainability of whole ecological regions are the focus of management
- **Long-term Focus that Incorporates Adaptive Management**: The goal of EBM includes establishing long-term goals for desired ecological conditions that maintain the capacity to provide public benefits and opportunities. Monitoring is an essential element in EBM, and the results of the monitoring are used to adjust the scope and direction of the overall management program
- **Comprehensive Perspective**: EBM seeks to identify management approaches that support

[2] Minnesota Department of Natural Resources at URL: http://www.dnr.state.mn.us/ecological_services/ebm/index.html (viewed May 2007)

economic prosperity, lasting livelihoods, and ecological integrity

The incorporation of EBM as a core tenet of the Management Plan is considered to be an overarching Plan element. The District will implement EBM through the coordinated implementation of all of the policies in the Plan that address the EBM elements, rather than by developing a single EBM sub-plan. That is, the District's goal is to have an ecosystem-based focus as the skeleton on which the other policies in the Management Plan are placed.

CAE-2: Maintain, restore, and enhance aquatic ecosystem integrity

Policy: The District shall maintain, enhance, and, where feasible, restore aquatic resources, with special protection given to areas and species of special biological or economic significance. The District shall require that uses of the freshwater, estuarine, and coastal environments under the District's jurisdiction are carried out in the manner that will sustain the biological integrity of these freshwater, estuarine, and coastal ecosystems, and will maintain healthy populations of aquatic species adequate for long-term commercial, recreational, scientific, and educational purposes. The District shall assist other agencies in maintaining and, where feasible, restoring the biological integrity, productivity, and quality of streams, wetlands, estuaries, and coastal waters under the District's jurisdiction adequately to maintain viable populations of aquatic organisms and protect human health through, among other means:

a. minimizing adverse effects of wastewater and stormwater discharges and entrainment
b. minimizing adverse effects of industrial and commercial port-related activities
c. controlling the quantity and quality of runoff
d. preventing the discharge of vessel wastes and minimizing the impacts of ballast water discharges
e. preventing or containing discharges of fuels or other toxic or hazardous materials and
f. restoring adversely affected areas to pre-disturbance conditions

Discussion: This is a basic policy direction for managing Humboldt Bay sustainably. Maintaining the biological integrity of the Bay region's aquatic ecosystems means that the District has adopted a commitment to "keeping all the functional pieces" that are necessary for sustaining the Bay's environment.

The general policy cannot be applied simply, because the kinds of scientific results that support developing measures of "biological integrity" are still in early development stages nationally and regionally. The basic policy requirement (that is, maintaining the integrity of biological systems) may be approximated by maintaining population structures, food webs, and the underlying physical conditions within the domain regions that support the existing Bay's functions. The District, relying on assistance from agency and academic scientists and other interested parties, will evaluate existing studies about biological integrity, and will integrate with those results a number of other kinds of ecological information, such as information about aquatic ecosystem structure and functioning. This policy therefore establishes a basic functional direction for managing Humboldt Bay's environmental resources.

CAE-3: Protect and maintain environmentally sensitive habitat areas

Policy: The District shall ensure that environmentally sensitive habitat areas under the District's jurisdiction, both terrestrial and aquatic, are protected against significant disruption of habitat values, and that only uses dependent on such resources shall be allowed within such areas. The District shall require that development in areas adjacent to environmentally sensitive habitat areas under the District's jurisdiction shall be sited and designed to prevent impacts which would significantly degrade such areas, and uses shall be compatible with the continuance of such habitat areas. The District shall consult with other agencies to assure that developments that are not under the District's jurisdiction do not degrade environmentally sensitive habitat areas under the District's jurisdiction.

Discussion: This policy paraphrases basic policy guidance from the Coastal Act and the federal Clean Water Act. The policy requires that potential uses that

do not have to be sited in environmentally sensitive areas will be sited elsewhere, and that uses that are required to occur in environmentally sensitive areas be sited and operated in ways that minimize the adverse effects that they create. The policy also directs the District to consult with other agencies that may approve potential uses which could adversely affect Humboldt Bay's environmental resources in order to ensure that the agencies are aware of the District's concern that such uses not adversely affect the environmental resources of Humboldt Bay.

CAE-4: Work cooperatively to develop and implement a restoration and enhancement plan for Humboldt Bay's aquatic ecosystems

Policy: The District, in consultation with the Department of Fish and Game, the Coastal Commission, the U. S. Fish and Wildlife Service, the U. S. Army Corps of Engineers, other affected state and federal agencies, Humboldt County, the City of Eureka, the City of Arcata, the Wiyot Tribe and other affected landowners, and other interested parties, shall prepare or cause to be prepared a management, and enhancement plan for wetlands and other aquatic ecosystem elements occurring in Humboldt Bay, consistent with the provisions of this Management Plan. The objectives of the plan shall include:

a. to enhance the biological productivity of wetlands;
b. to minimize or eliminate conflicts between aquatic ecosystems and developed uses
c. to provide stable boundaries and buffers between developed areas and habitat areas
d. where feasible, to provide guidance for avoiding impacts and to inform mitigation planning for future development proposals that may include aquatic ecosystem areas
e. to accommodate a coordinated response to possible sea surface elevation increases in ways that allow for the enhancement of wetlands and the protection of valuable human improvements in the Humboldt Bay watershed
f. to incorporate the enhancement of diked former tidelands, where feasible, into the management of major hydrological events like floods in ways that are compatible with both adjacent land uses and wetland ecosystem functions

The plan shall include an element that ranks various restoration or enhancement options for aquatic ecosystems in a Humboldt Bay-wide sense. The District shall consider the priorities in this plan in establishing mitigation requirements for proposals subject to the District's jurisdiction. The District shall adopt findings with respect to the requirements of this plan when approving District operational programs or when approving any applications for approvals submitted to the District.

Discussion: This policy creates the direction necessary for the District to address the suggestions of several members of the District's Management Plan Task Force. The policy directs the District to develop a Bay-wide restoration and/or enhancement plan for wetlands and other aquatic ecosystems, in consultation with representatives of other local, state, and federal agencies and other interested parties. The plan must evaluate options, identify an overall restoration/enhancement plan for the entire watershed, and incorporate the elements already developed as part of extant watershed plans for the Bay. The potential utility of such a plan for identifying an overall wetland restoration strategy for Humboldt Bay has been discussed for many years.

Several of the primary benefits of a regional wetland restoration plan are identified in the measure. Such a plan could result in a collectively endorsed restoration approach for the entire watershed. It would be beneficial for the District in providing additional expertise for the District with respect to identifying important ecosystem components. Such a plan also would be expected to assist the District in identifying and ranking mitigation opportunities for potential wetland impacts that might result from policies or implementing actions that result from this Plan.

CAE-5: Work cooperatively to develop and implement a water-quality maintenance plan for Humboldt Bay

Policy: The District shall consult with the North Coast Regional Water Quality Control Board, Humboldt County, the City of Arcata, the City of Eureka, and other appropriate local, state, and federal

agencies, to develop and implement a plan improving and maintaining water quality in Humboldt Bay at a level that will support and promote the beneficial uses identified for Humboldt Bay in the North Coast Regional Water Quality Control Board's Water Quality Control Plan for the North Coast Region. The resulting Humboldt Bay Water Quality Management Plan shall consider the potential effects of all management actions carried out by the District, the potential effects of all actions approved by the District, the potential effects of actions carried out or approved by other jurisdictions and parties within the Humboldt Bay watershed, the effects of land use in the watershed on runoff processes affecting Humboldt Bay, and the potential contribution of existing pollutants to water quality maintenance and the achievement of beneficial uses in Humboldt Bay. The District shall adopt findings with respect to the requirements of this plan when approving District operational programs or when approving any application for project approval submitted to the District.

Discussion: This measure directs the District to work cooperatively to develop a water quality management plan for Humboldt Bay, and would cause the District (in consultation with the other participants in the plan development effort) to consider potential impacts to water quality from uses or conditions throughout the Bay's watershed. While many of the potential water quality concerns that would be identified in this study are not under the District's jurisdiction, the plan-development process will allow other agencies and private organizations to identify sources of water quality impacts in the watershed, and the plan will allow the District to identify the significance of the adverse effects on the Bay's water quality and beneficial uses. The plan would also allow the participants subsequently to identify measures to mitigate the significance of the adverse impacts.

5.3 Aquatic Species Management

5.3.1 Goals and Objectives

Goals:

- Manage Humboldt Bay and its habitats to maintain viable populations of native and desirable non-native species

Objectives:

- Maintain habitat areas and distributions that adequately support desired species
- Maintain and enhance populations of economically and ecologically important species
- Eradicate or reduce the abundances of nonindigenous species

5.3.2 Policies

CAS-1: Maintain biological diversity and important habitats throughout Humboldt Bay

Policy: The District shall, to the extent possible, maintain viable populations of native species in Humboldt Bay, distributed in appropriate habitats within the Bay, in a state that will maintain the ecological functions of the Humboldt Bay ecosystem. The District shall develop a plan, in consultation with local, state, and federal agencies, non-profit conservation organizations, and other interested parties, which is focused on maintaining the native biological diversity and important habitats that are present in Humboldt Bay and its watershed. The plan shall expressly address eelgrass and other habitats that are closely linked to environmentally sensitive species. The plan shall identify strategies for District adoption that will assist the District in managing or protecting native biological diversity while carrying out District operations. The District shall also incorporate considerations that could result from actions proposed to the District by applicants for District approvals. The District shall adopt findings with respect to the requirements of this plan when approving District operational programs or when approving any applications for approvals submitted to the District.

Discussion: This policy embodies basic principles of conservation science in directing the District (and thus other agencies and interested parties) to protect habitat conditions throughout Humboldt Bay that maintain viable biological populations of native species. Large, well-distributed habitat occurrences are considered by conservation scientists to be more likely than smaller and less-well-distributed habitat occurrences in maintaining populations of desired species and preventing declining abundances, as well as in preventing catastrophic population failures as a

consequence of adverse events (such as toxic spills). In considering a plan to assure well-distributed population segments, the plan would also identify species or habitat types that are narrowly distributed or uncommon, another criterion for conservation priority. The plan would need to consider the likely effects of the District's Management Plan, and would thus include measures for preventing the Plan's implementation from adversely affecting the viability of populations of native species.

CAS-2: Maintain and enhance conditions required by commercially important fish, invertebrate, and plant species

Policy: The District shall, to the extent possible, maintain viable populations of commercially important fish species and invertebrate species, and the habitats for these species. The District shall develop a plan, in consultation with local, state, and federal agencies, non-profit conservation organizations, and other interested parties, which is focused on maintaining the diversity of native and desired non-native fish and invertebrate species present in Humboldt Bay and its watershed. The plan shall identify strategies for District adoption that will assist the District in managing or protecting native and desirable non-native fish, invertebrate, and plant species while carrying out District operations. The District shall also incorporate considerations that could result from actions proposed to the District by applicants for District approvals. The plan shall identify District responsibilities with respect to managing the population levels and habitat for commercially important native fish species and their habitats, including eelgrass, and the plan shall identify the District's responsibilities for implementing the Essential Fish Habitat recommendations of NOAA Fisheries. The plan shall also address District responsibilities with respect to managing population levels and habitat for commercially important invertebrate or plant species. The District shall adopt findings with respect to the requirements of this plan when approving District operational programs or when approving any applications for approvals submitted to the District.

Discussion: This policy adopts an approach for commercially important species that is similar to the approach identified in the previous policy. This policy would direct the District, in consultation with other agencies and interested parties, to develop a plan that would identify and protect important habitat areas for commercially important species of fish, invertebrates, and plants. The plan called for in this policy may be a part of the plan developed as a result of the previous policy. The species list for this plan likely would include most or all of the species that should be addressed pursuant to Policies HFA-6 and HFA-7 in section 2.5 in Chapter 2.0 of this Plan Section.

CAS-3: Maintain and enhance habitat for sensitive species

Policy: The District shall, to the extent possible, maintain habitat for sensitive species identified under auspices of California or federal law. The District shall develop a plan, in consultation with the California Department of Fish & Game, the U.S. Fish & Wildlife Service, and NOAA Fisheries, that will assist the District in incorporating the requirements of these agencies for managing or protecting state-listed or federally listed species, and any identified critical habitats, that may be affected by District operations. The District may also incorporate considerations that could result from actions proposed to the District by applicants for District approvals. The District shall adopt findings with respect to the requirements of this plan when approving District operational programs or when approving any applications for approvals submitted to the District.

Discussion: This policy extends the District's planning requirements to include species and habitats that are considered sensitive pursuant to one or more state or federal laws. The plan that resulted from this policy likely would be an element in the plans that resulted from implementing the previous three policies; that is, it is likely that a single plan could be developed that would address all four policies.

This policy essentially embodies elements of the requirements of existing state and federal laws that protect sensitive species and habitats. The development of the plan specified in this policy would functionally meet a portion of the habitat-based plan-development requirements that the federal Endangered Species Act and the California Endangered Species Act require

as an element of a program allowing the "incidental take" of listed species for otherwise lawful activities. Consequently the plan called for by this policy will help the District and other parties achieve compliance with the requirements of these laws while enacting the Management Plan.

CAS-4: Control or remove non-indigenous invasive species

Policy: The District shall, to the extent possible, participate in the restoration of native biodiversity in the Humboldt Bay ecosystem through the management of exotic or non-indigenous species. The District shall, in consultation with appropriate federal, state, and local agencies, non-profit conservation organizations, and other interested parties, reduce the abundance of or eliminate detrimental non-native species within areas subject to District jurisdiction, and elsewhere in the Humboldt Bay watershed. Non-native species shall not be used in habitat restoration or enhancement projects that are subject to District jurisdiction. Any habitat restoration or enhancement project approved by the District shall include a monitoring program for non-native species, and shall identify contingent measures to control or eradicate detrimental non-native species where appropriate. The plan shall identify a strategy for District actions that will be focused on preventing the introduction of additional non-native species as a result of port-related activities in Humboldt Bay. If appropriate, the plan may endorse active programs to eradicate selected non-native species. The District shall adopt findings with respect to the requirements of this plan when approving District operational programs or when approving any applications for approvals submitted to the District.

Discussion: The introduction of non-indigenous invasive species into the Humboldt Bay ecosystem is a form of pollution, which may be associated with a loss of native biodiversity within the biological communities in the receiving waters. This policy provides direction to the District to manage (i.e., control or eradicate) these ecologically damaging populations. The federal government has existing invasive species management programs, established pursuant to Executive Order 13112 and to the National Invasive Species Act of 1996; the latter specifically applies to managing non-indigenous species in ballast water. The essential effect of the policy is that the District is directed to work collaboratively with the U. S. Coast Guard, other federal and state agencies, and interested parties to monitor, prevent, and/or control invasive species that are introduced into Humboldt Bay.

CAS-5: Fill placement may be used for habitat enhancement purposes

Policy: Based on appropriate ecological analysis and the resulting findings, and upon consultation with the relevant federal, state, and local agencies and other interested parties, the District may authorize the placement of minor amounts of fill in order to enhance or restore habitats for fish, other aquatic organisms, or wildlife.

Discussion: This policy represents an authorization for the District and other agencies to use the placement of fill in wetlands as an element in an overall management program for the enhancement or protection of habitats in Humboldt Bay. The policy is functionally neutral, in that fill could not be placed without authorizations from a number of additional state and federal agencies, but if the policy were not incorporated in this Plan the District would not have the ability to authorize such fill placement regardless of the potential benefits.

CAS-6: Fill Placement may be used for cultural resource protection purposes

Policy: The District may authorize the placement of minor amounts of fill in order to protect sensitive cultural resource sites in danger of erosion, saltwater intrusion, or other potential damage or degradation. Such fill shall be placed only following a demonstration that no other method adequately protects the sensitive cultural resource sites.

Discussion: Some cultural resources, particularly some important Native American resources that occur in areas subject to the District's jurisdiction may require protection from erosion or other adverse circumstances through the introduction of minor amounts of fill into areas regulated by this Plan. This policy authorizes the District to approve minor fill placement in order to protect such resources.

Many animals blend in with their environment

Port stern of the Star Herdla

Essayons *at Humboldt Bay entrance*

5.4 Humboldt Bay Ecosystem Management Program Elements

5.4.1 Goals and Objectives

Goals:

- Provide standards for reviewing District projects and submittals for District approvals that protect the Bay's ecosystem components while authorizing appropriate uses

Objectives:

- Develop policy guidance that identifies appropriate development types for Humboldt Bay while minimizing or preventing commitments to inappropriate proposals by applicants or other agencies
- Develop submittal standards that identify necessary information for applicants for District approval while limiting proposals for inappropriate kinds of development or development at inappropriate locations
- Develop a mitigation policy for development in Humboldt Bay that adequately protects the Bay's ecosystem elements and environmental resources

5.4.2 Policies

CEP-1: Impacts to streams, wetlands, estuaries, and coastal waters may be authorized for specific purposes or project types

Policy: Consistent with all other applicable policies of this Management Plan, the District may authorize development or uses within streams, wetlands, estuaries, and open coastal waters under the District's jurisdiction only for the following:

a. Port facilities
b. Energy facilities
c. Coastal-dependent industrial facilities, including commercial fishing facilities
d. Maintenance or expansion of existing or restoration of previously dredged depths in navigation channels, turning basins, vessel berthing and mooring areas, and boat launching ramps
e. Incidental public service purposes which temporarily impact the resources of the area, such as burying cables or pipes, inspection of

piers, and maintenance of existing intake and outfall lines

f. Flood control projects where no other method for protecting existing structures in a stream or river flood plain is feasible and where such protection is necessary for public safety or to protect existing development

g. Habitat restoration or enhancement projects

h. Nature study, aquaculture, or similar resource-dependent activities

i. New or expanded boating facilities

j. Placement of structural piling for public recreational piers that provide public access and recreational opportunities

Discussion: This policy adopts the form of similar policies that are included in the General Plan documents of a number of local agencies within the California Coastal Zone, and is based on existing Coastal Act requirements. The policy establishes a number of categories of use for which the District may authorize or approve a proposal that directly affects streams, wetlands, estuaries, and open coastal waters. Projects of other kinds may not be approved by the District in those aquatic ecosystem elements.

CEP-2: Dredging may be approved under specified conditions

Policy: Dredging, when otherwise consistent with the provisions of this Management Plan or other adopted District regulations, shall be subject to the following conditions:

a. Dredging shall be prohibited in identified key breeding and nursery areas during periods of fish migration and spawning.

b. Dredging, including maintenance dredging, shall be limited to the smallest area feasible to accomplish the purposes for which the dredging is proposed.

c. Designs for dredging projects shall incorporate protective measures to protect water quality in adjacent areas during construction, by limiting the discharge of refuse, petroleum spills, and the unnecessary dispersal of mobilized silt and other materials.

Generally, the District shall require that dredging and spoils disposal avoid significant disruption to aquatic ecosystems and water circulation.

Discussion: This policy establishes specific guidance and conditions for any proposal considered by the District that involves dredging. Implementing this policy may require the development by the District, or the adoption from another source, of subsidiary standards or protective measures that may be considered with respect to proposals involving dredging. Generally, this policy provides direction to the District with respect to minimum requirements to be met to minimize the impacts of dredging.

CEP-3: Revetments, breakwaters, and other shoreline structures may be approved under specified conditions

Policy: The District shall permit revetments, breakwaters, groins, channels, seawalls, retaining walls, and other construction that alters natural shoreline processes only when required to serve coastal-dependent uses or to protect existing structures, agricultural lands, natural and environmental resource lands, cultural resource sites, public facilities, or public beaches in danger from erosion or saltwater intrusion.

Discussion: This policy restricts the use of shoreline protection structures that alter natural shoreline processes. The effect of the policy is that it directs District staff and decision-makers to evaluate the extent to which a proposed project that uses these shoreline protective features affects shoreline processes. If the proposal has a significant adverse effect on shoreline processes (such as interrupting sediment transport along a shoreline), the policy directs that the District not authorize the structures unless the project is one of the project types specified in the policy, or until the effect on shoreline processes has been eliminated.

CEP-4: Functional capacity of aquatic ecosystems must be maintained

Policy: The District shall permit the diking, filling, or dredging of streams, wetlands, estuaries, and open coastal waters under the District's jurisdiction only under the following conditions:

a. The diking, filling or dredging is for a permitted use in that resource area;

b. There is no feasible, less environmentally damaging alternative;

c. Feasible mitigation measures have been provided to minimize adverse environmental effects;

d. The functional capacity of the resource area is maintained or enhanced. Functional capacity means the ability of the streams, wetlands, estuary, or coastal waters to be self-sustaining and to maintain natural species diversity. In order to establish that the functional capacity is being maintained or enhanced, all of the following must be demonstrated:

(1) Presently-occurring indigenous plant and animal populations in the ecosystem will not be altered in a manner that would impair the long-term stability of the ecosystem, i.e., natural species diversity, abundance and composition are essentially unchanged as the result of the project;

(2) A species that is rare or endangered will not be significantly adversely affected; and

(3) Consumptive (e.g., fishing, aquaculture and hunting) or nonconsumptive (e.g., water quality and research opportunity) values of the streams, wetlands, estuary, or open coastal waters will not be significantly reduced.

Discussion: This policy is similar to, and is based upon, Coastal Act requirements for maintaining natural conditions and/or for minimizing adverse impacts on streams, wetlands, estuaries, and open coastal waters that result from projects considered by the District. The policy limits the kinds of projects or proposals that may occur in these ecosystem types, and establishes requirements for minimizing impacts and incorporating feasible mitigation.

The most significant element in the policy is a requirement that the proposed project maintain the "functional capacity" of the aquatic ecosystem, and the policy establishes a tripartite functional test that the District will use for verifying that functional capacity is maintained. This test will require that follow-on monitoring be conducted for projects approved by the District, in order to demonstrate the compliance of the projects with this policy.

CEP-5: Water quality protection is required

Policy: The District shall evaluate proposals for dredging, filling, or creating shoreline structures to determine potential effects upon water circulation. Water circulation in Humboldt Bay shall be maintained at levels adequate to maintain high water quality in the Bay and its adjacent wetlands and tributary streams. Proposals that alter water circulation sufficiently to affect water quality in or near the Bay shall be modified as necessary to avoid the adverse water quality effects.

New projects shall be sited, designed, constructed and maintained to prevent or, if prevention is infeasible, to minimize the discharge of pollutants into Humboldt Bay. Minimum standards for water quality management associated with new projects shall include:

a. controlling pollutant sources at the project site, including sediment and other nonpoint source pollutants, through the use of appropriate Best Management Practices; and

b. using non-polluting construction materials to the greatest extent practicable.

Discussion: This policy includes two requirements that are related to water quality. The first requirement is that proposed projects not significantly affect water circulation in Humboldt Bay, its nearby wetlands, or in streams that are subject to District jurisdiction. The policy requires that the applicants demonstrate to the District's satisfaction that proposed projects do not have adverse effects on water circulation; the District may require modification of projects that do have such potential effects.

The second water-quality requirement in this policy is that projects incorporate adequate runoff management and erosion control measures to prevent point-source and nonpoint-source pollutants from being mobilized and subsequently entering Humboldt Bay. This requirement echoes existing requirements in state and federal law; the inclusion of this policy in this Plan grants the District a role in reviewing and approving the proposed control measures in order to protect aquatic ecosystems that could otherwise be affected.

CEP-6: Mitigation program requirements are identified

Policy: The District shall require that proposed actions that create impacts to streams, wetlands, estuaries, and open coastal or marine waters under the District's jurisdiction, which are otherwise in accordance with the policies of this Management Plan, shall, at a minimum, incorporate the following mitigation elements:

a. A mitigation program that incorporates feasible mitigation measures for all impacts. A detailed mitigation plan shall be required as part of the project application, including a plan for each specific site where mitigation is proposed. The mitigation plan shall include provisions for purchase, if required, and restoration or enhancement that results in equal or greater functional capacity when compared to the impact of the proposal, and the dedication of the mitigation site(s) to a public agency or other method which permanently restricts the use of the site(s) to habitat and open space purposes. The restoration site(s) normally shall be purchased or otherwise made available prior to any permitted diking or filling;

b. Mitigation shall, to the maximum extent feasible, result in the same ecosystem type(s) as the area(s) affected by the proposal (i.e., freshwater marsh for freshwater marsh, saltwater marsh for saltwater marsh, etc.).

c. Where no suitable private or public restoration or enhancement sites are available, an in-lieu fee may be required to be paid to an appropriate public agency for use in the restoration or enhancement of an area of equivalent functional capacity, productive value, or surface area.

Discussion: This policy establishes the overall requirements for mitigation proposals for projects that adversely affect streams, wetlands, estuaries, and open coastal waters subject to the District's jurisdiction. The District may use this policy to assure that applicants propose adequate mitigation programs, including, if necessary, payment of in-lieu fees.

CEP-7: Mitigation efforts must follow an identified sequence, with avoidance preferred and compensation least-favored

Policy: Generally, the District shall follow the sequence of mitigation identified in California Administrative Code section 15370, with a preference for mitigation priority in the listed sequence:

a. Avoiding the impact altogether by not taking a certain action or parts of an action

b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation

c. Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment

d. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action

e. Compensating for the impact by replacing or providing substitute resources or environments

As a first priority, projects that result in adverse effects to environmental resources under the District's jurisdiction shall be re-designed to avoid adverse environmental impacts to Humboldt Bay, including water surface area, volume, or circulation; impacts to plants, fish, other aquatic organisms and wildlife habitat; archaeological or other cultural resource sites; to subtidal areas; or tidal marshes or tidal flats. Whenever adverse impacts cannot be avoided, they shall be minimized to the greatest extent practicable. Measures to compensate for unavoidable impacts shall be adopted only if impacts cannot be first avoided, reduced in intensity, or offset by project modifications.

Discussion: This policy is a restatement of the mitigation definition incorporated in the California Environmental Quality Act. The policy is also a restatement of the "mitigation sequencing" policy adopted by the U. S. Fish & Wildlife Service, in which the acceptability of a mitigation proposal declines in order down the list from a. to e. The District's adoption of this policy establishes a local requirement that avoidance is the preferred form of mitigation and that the acceptability of proposed mitigation elements for the District declines down the list from a. to e.

CEP-8: Mitigation proposal elements are defined

Policy: When a mitigation proposal is submitted to the District, the mitigation proposal shall describe the proposed design, construction, and management of all mitigation areas, including:

a. Clearly described mitigation project goals, including functions that are to be restored or created, areas of ecosystem types established, and other information that may be identified by District staff;

b. Measurable performance standards for establishing the success of the mitigation, which shall be included as an element in the proposed mitigation;

c. A monitoring or reporting plan that will allow the District to identify potential problems and determine appropriate remedial actions;

d. A contingency plan to develop and implement alternative mitigation if the initially proposed mitigation is not successful; and

e. Financial assurances, such as performance bonds or letters of credit, to cover the cost of developing alternative mitigation projects if the initial mitigation plan does not achieve the mitigation goals.

Discussion: This policy is similar to policies adopted by many local agencies in the Coastal Zone and elsewhere with respect to the contents of mitigation proposals made to the District to avoid, offset, or minimize adverse effects on the environment. The policy establishes the District's authority to require such elements in mitigation proposals from applicants for District approvals.

CEP-9: Mitigation must be implemented before or at the same time as the impact being mitigated

Policy: Mitigation elements for proposals approved by the District shall, to the extent practicable, be completed prior to or concurrently with the parts of the project causing adverse impacts to aquatic resources under the District's jurisdiction.

Discussion: This policy establishes the District's guideline that mitigation elements should be in place prior to or concurrently with the impact being mitigated.

CEP-10: Buffer requirements are defined for proposals affecting the Bay and other aquatic ecosystems

Policy: The District shall require buffers for streams, wetlands, estuaries, and open coastal waters that occur adjacent to proposed uses or projects that are under the District's jurisdiction. This requirement shall apply to aquatic habitat areas that are adjacent to, but not included within, the boundaries of the proposed uses or projects (other policies in this Plan define mitigation requirements within proposed project sites). The intent of this policy is to limit effects from proposed coastal-dependent (or water-dependent) projects in adjacent aquatic habitat areas, to the extent feasible.

The minimum width of a buffer shall be 100 feet, unless the applicant for the proposed development demonstrates on the basis of site specific information, the type and size of the proposed development, and/or proposed mitigation (such as planting vegetation) that will achieve the purposes(s) of the buffer, that a smaller buffer will protect the resources that are being protected by the buffer. The buffer width may also be reduced if the District finds that a full-width buffer is infeasible, based on project-specific evidence. As necessary to protect environmentally sensitive streams, wetlands, estuaries, and open coastal or marine waters, the District may require a buffer greater than 100 feet. Maps and supplemental information submitted as part of the application shall be used to specifically determine these boundaries.

Discussion: This policy establishes a District requirement for buffers adjacent to aquatic ecosystem elements when the District considers proposed uses adjacent to those elements. The policy does not apply for shoreline projects, docks, piers, wharves, channel maintenance, or similar projects, which are covered by other policies in this Plan. This policy does apply to aquatic habitat areas that are near such projects; the policy protects these adjacent habitat areas from adverse effects as a result of the primary project. While the policy identifies a "standard" buffer width of 100 feet, the District may require increased buffer widths if necessary to protect aquatic ecosystems, or may reduce buffer width if evidence indicates that doing so will not adversely affect the buffer's effectiveness. The policy

also allows the District to reduce the buffer width upon finding that a full-width buffer is infeasible, based on project-specific evidence. The policy authorizes the District to carry out evaluations of the effectiveness of buffers of differing widths.

CEP-11: Determinations about boundaries, buffers, or other environmentally sensitive areas require specific information

Policy: Where there is a question regarding the boundary, buffer requirements, location, or current status of an environmentally sensitive area identified pursuant to the policies of this Management Plan, the District shall require an applicant to provide the District with the following:

a. Base map delineating topographic lines, adjacent roads, location of dikes, levees, of flood control channels and tide gates, as applicable;

b. Vegetation map, including identification of species that may indicate the existence or non-existence of the sensitive environmental habitat area;

c. Soils map delineating hydric and non-hydric soils; and

d. Census of animal species that may indicate the existence or non-existence of the sensitive environmental habitat area.

The District shall transmit the information provided by the applicant pursuant to this policy to relevant state and federal agencies for review and comment. Any comments and recommendations provided by the agencies shall be immediately sent to the applicant for his or her response. The District shall make its decision concerning the boundary, location, or current status of the environmentally sensitive habitat area in question based on the substantial evidence in the record and shall adopt findings to support its actions.

Discussion: This policy is similar to policies adopted by many local governments in establishing the authority of the District to require the submission of adequate information to allow the District to resolve questions about such considerations as the locations of wetland boundaries the nature of streams, wetlands, estuaries, and open coastal waters affected by a proposal; potential effectiveness of buffers; or other biological and physical characteristics of a project location. This policy also requires that the District provide evidence for the administrative record of an application that it reviewed and considered such evidence for a proposed project (by making findings that specifically address the substantive information).

CEP-12: Indian Island use is restricted to environmental and Native American purposes, and management decisions shall be made cooperatively

Policy: The District shall consult with the City of Eureka, the Wiyot Tribe, and other interested parties in the management of uses and resources in the tidelands of Indian Island. Tideland areas shall generally be managed according to the policies set forth in this Plan. Tideland uses of tribally owned areas within Indian Island may include environmental restoration, cultural resource protection, brownfield cleanup, the Tribe's restoration of a traditional ceremonial site, and other uses that are compatible with the scope of this Plan.

Discussion: Indian Island is an area that generally is lower than Mean Sea Level in elevation, and most of the island falls under the District's legislatively defined jurisdiction. The City of Eureka owns the majority of Indian Island, and a smaller area of the island is owned by the Wiyot Tribe. Management decisions concerning Indian Island thus inherently require a collaborative approach, as identified in this policy. This policy also identifies uses that may be authorized on Indian Island.

CEP-13: Greenhouse gas emissions to be considered

Policy: The District shall consult with the California Energy commission, the California Air Resources Board, and other interested parties in identifying relationships among District operations, energy consumption, and the related greenhouse (GHG) emissions. The District shall develop a plan to comply with State of California GHG recommendations, or with regulations that may be promulgated for local agencies pursuant to state or federal law.

Discussion: The State of California has identified as an important concern for state and local agencies the generation of GHGs that may affect climate. The potential effects of a warming climate include

rising sea level, which is a primary District concern addressed in this plan. This policy directs the District to identify potential effects of District operations on GHG emissions and to implement a program to address GHG emissions that is consistent with state guidelines.

5.5 Public Involvement and Outreach

5.5.1 Goals and Objectives

Goals:

- Establish a communication program to inform the public about Humboldt Bay and the District's decision-making processes

Objectives:

- Develop a communication program that regularly brings community members into the District's deliberative processes for managing environmental resources
- Enhance the District's communication capabilities via news outlets, District publications, the internet, and other means

5.5.2 Policies

CPE-1: District maintenance of communications with media

Policy: The District shall maintain familiarity and a working relationship with the news outlets and other means of public media communication for the Humboldt Bay region.

Discussion: This policy establishes a requirement that the District maintain a working relationship with public media so that the District's actions will be adequately covered by the media. Establishing the policy elevates the importance of public outreach and the dissemination of information about District actions.

CPE-2: Increased use of District website for communicating about Bay management

Policy: The District shall continue to develop the capabilities of the District's website, which shall be used to convey to the public information about the environmental resources in Humboldt Bay, about proposed uses within the Bay that could affect those resources, and about the general status of the District's processes for managing the Bay.

Discussion: This policy directs District staff and decision-makers to increase the importance of the District's website as a primary means of communicating the District's approach to conservation, and of specific proposals considered and actions taken by the District.

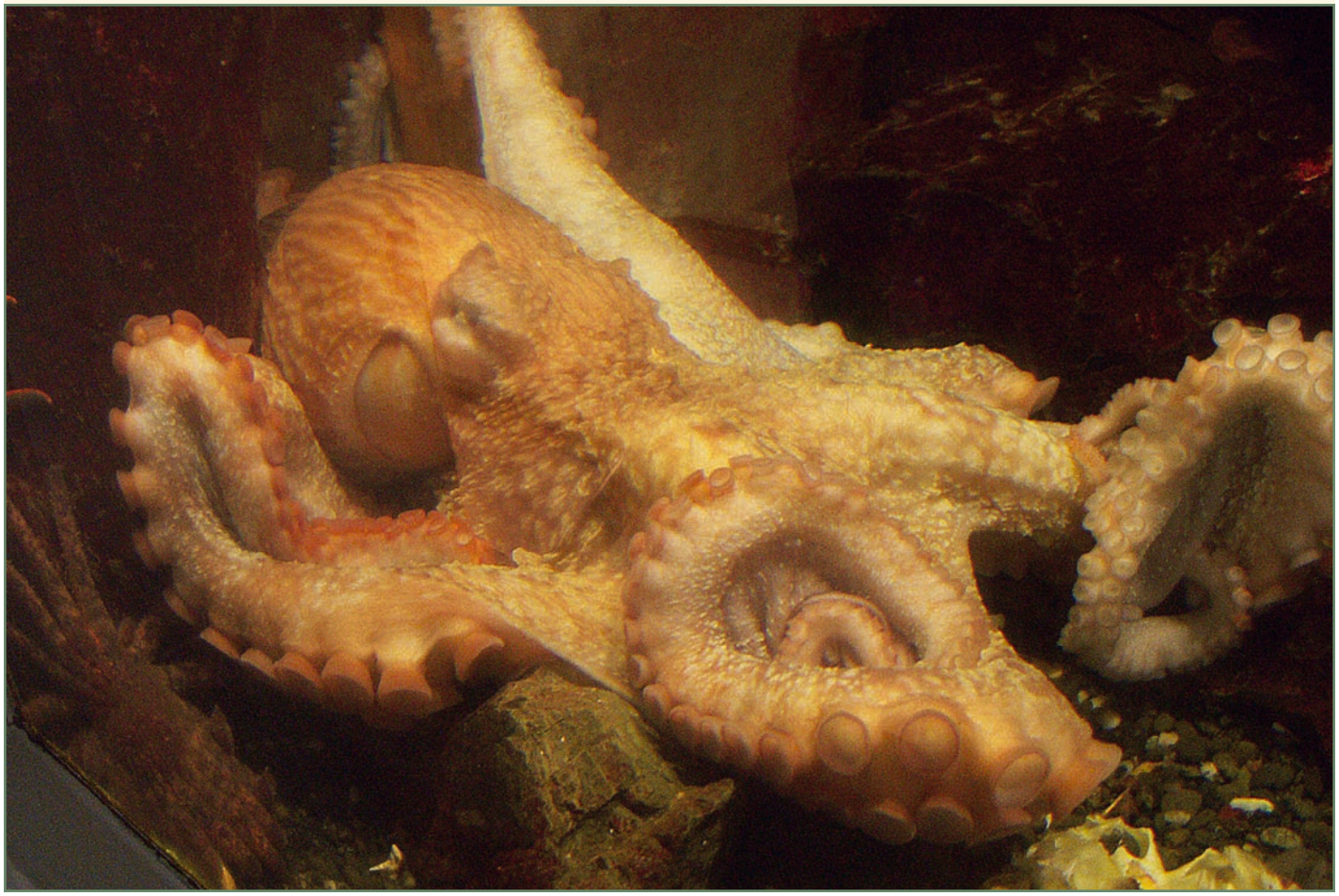
CPE-3: Humboldt Bay Management Plan Advisory Committee as forum for environmental resources and other management considerations

Policy: The District shall establish a standing committee, called the Humboldt Bay Management Plan Advisory Committee (HBMPAC). The HBMPAC will be overseen by two members of the District's Board of Commissioners. The HBMPAC will be staffed by the District's Director of Conservation. The HBMPAC will meet at intervals to consider the implementation of the Humboldt Bay Management Plan and to recommend appropriate additional policies or alterations in existing policies with respect to the environmental resources of Humboldt Bay, the District's review and approval processes, or other matters relating to this Plan. The HBMPAC will be strictly voluntary and advisory in nature. HBMPAC members will be appointed by the Board of Commissioners and shall serve at the pleasure of the District's Board of Commissioners.

Discussion: This policy reflects the District's desire for establishing a standing committee of citizens who will assist District staff and the Board of Commissioners in addressing conservation issues.

IMPLEMENTATION


10



Implementation Program Elements

Chapter 6.0

6.1 Plan Adoption and Implementation Generally

The Humboldt Bay Management Plan will be adopted by the District following an appropriate public review program and a programmatic environmental review pursuant to the California Environmental Quality Act (CEQA), as required by the District's ordinances and by state law.[1]

Following the Plan's adoption, the Plan will be implemented by the District in a sequential process. Immediately after its adoption, the Plan will form the basis for District decision-making with respect to all projects or actions proposed within Humboldt Bay. The District's staff and decision-makers will continue to use existing ordinance requirements to carry out the Plan's requirements with respect to activities that are brought before the Board. It is likely that, through time, additional implementing ordinances will be necessary; these would be developed by District staff, presented to the Board of Commissioners, considered with opportunity for public and agency comment, and adopted.

Presently, when the Board of Commissioners considers an application for an action or a project, the Board avails itself of the best information available, in combination with adopted District procedures. After the adoption of the Humboldt Bay Management Plan the Board will use, essentially, the same process, but the decisions will incorporate the results of assessments conducted according to the policies in this Management Plan.

The implementation of the Plan must, perforce, occur gradually. The Plan incorporates considerations that are currently made by the District, as well as many considerations and informational elements that are not currently part of the District's decision-making process. In addition, many Plan elements and policies require the development of supplementary information, and these information elements must be carried out before the specific Plan policies can

Outbound

Pickleweed

Woodley Island Marina

[1] The U.S. Environmental Protection Agency (EPA) has advised the District that because the grant that supported the development of this Plan was awarded pursuant to the Agency's authorities under Section 104(b)(3) of the Clean Water Act, NEPA documentation is not required for the District's adoption of the Humboldt Bay Management Plan.

be fully implemented. The District's contemplated program for developing the additional information and program elements is summarized in this chapter.

6.2 Participants in Plan Implementation

The District has identified generalized alternative implementation program directions for the policies identified in Section III. The generalized alternatives have a number of features in common, however, including the decision-making role of the District's Board of Commissioners, the functions that District staff will serve in the process, the roles played by other agencies, the importance of public involvement in the implementation process, and the essential participation of an advisory committee that will be created by the District to advise the District's decision-makers and staff regarding the relative priorities of elements and policies described in this Plan. The following general descriptions indicate the relative functions that are expected for these participants in the implementation process. The general process is summarized in the following subsection (subsection 6.3), and more particularized summaries of the generalized alternative implementation processes are presented in subsection 6.4.

District Decision-Makers. The authority and responsibility for implementing this Plan rests with the District's Board of Commissioners. In implementing the policy framework identified in this document, the Board will be the ultimate determiners and directors of District policy. The Board will provide direction to District staff. The Board will execute any memoranda of understanding or agreement developed jointly by staff and other agencies. The Board will approve or disapprove proposed actions and projects that will carry out the policies.

District Staff. The District's Chief Executive Officer, Director of Conservation, District Counsel, other District staff, and the District's consultants constitute the primary source of implementation programs for carrying out the policies identified in this Plan. The District's staff will carry the primary responsibility for developing the specific implementation elements called for in the policies in this Plan, for developing working agreements and draft language regarding memoranda through which implementation steps are reached, and for reviewing and providing recommendations regarding projects that require Board approval.

Advisory Committee. The implementation program contemplated by the District at the present time includes the appointment of a Humboldt Bay Management Plan Advisory Committee to assist the District in implementing this Plan. The composition of this committee has not been established at the present time. As noted below, the committee will be advisory to the District's staff and decision-makers, functioning by assisting staff and decision-makers in ranking implementation alternatives and selecting the elements that receive higher priority attention. The Committee may seek stakeholder, public, or agency comments. The Advisory Committee members will be appointed by the Board of Commissioners to serve an as-yet-undetermined term. The Advisory committee will serve at the will of the Board of Commissioners and will receive no compensation.

Other Agencies. The implementation of many of the policies in the Management Plan is predicated on the joint action of, or agreement between, the District and one or more other public agencies. In order to carry out these policies, the District will solicit the participation of other public agencies that are involved in regulating activities in Humboldt Bay (see Section I and the descriptions of agency responsibilities in Volume II) in the development of agreements or understandings about the implementation of this Plan. The District's goal in the consultations with other agencies will be to develop District programs that would also allow the District and other Bay users to meet the requirements of the other agencies, thus streamlining the review processes for projects or activities proposed in the Bay.

Public. Because the Management Plan has been created to address public concerns regarding the Bay's management, the Plan will be the subject of a public review prior to its adoption by the District (as described elsewhere). The implementation elements for this

Plan will also receive public reviews, in at least two contexts in most cases. First, the Advisory Committee identified above will include some members of the public, selected to assure that the District is able to gauge public concerns with the Plan's implementation proposals. Second, the District's decision-makers will consider the implementation program elements before adopting them formally, and this step is expected to provide an opportunity for public review and comment prior to Board action.

Applicants. Many of the Plan elements are focused on specific conditions in Humboldt Bay, or on activities that are allowed in the Bay upon approval by the District's Board of Commissioners. The primary source of a significant (but unspecified) fraction of the projects will be applicants for District approvals of projects that "use" the Bay (in general, the majority of the remainder of the projects is likely to be actions that the District undertakes on its own recognizance).

6.3 General Process

The Management Plan will be implemented through a general process involving the participants identified above. As noted in the following section, implementation processes will differ according to details of the implementation actions needed; however, all of these processes have a common theme in that these participants will be involved in the Plan's implementation.

In one sense, the Plan elements can be implemented by people who work in and around Humboldt Bay as they carry out the actions involved in their normal activities. That is, the Management Plan is expected to have immediate application with respect to the actions of people and enterprises related to the Bay, such as fishermen, shippers, recreationalists, and a range of other people who use the Bay as part of their daily activities. Some of the activities that occur on the Bay require approvals from the District. These approvals will be issued pursuant to the policies in the Plan, following its adoption.

The Plan requires the development of a number of supplemental agreements or technical planning documents, however, which will subsequently be used to guide the District in specifically implementing the policies in the Plan. In order to develop the supplementary information the District will invoke a process that allows District staff, together with a newly constituted advisory committee, to consider and recommend approaches to developing the supplementary materials in a manner that best uses the time and skills of District staff.

Regardless of the approach used to reach the recommendations, the ultimate factor in implementing Plan elements will be an approval by the District's Board of Commissioners. The Board will consider specific permit applications, the adoption of supplementary plans, the adoption of memoranda of understanding or agreement, or other approvals, based on the recommendations of District staff, the comments from the Advisory Committee, information received from other agencies, and other information that emerges from the Board's considerations in specific cases. In this deliberative process will be included assessments by District staff of the policy framework (i.e., the application of this Plan to each potential action), CEQA documentation when relevant, and the results of public reviews when appropriate.

Thus the District's Board of Commissioners represents the focus of the Plan's implementation, and the ultimate source of approval for the Plan's application to the resources in Humboldt Bay. The more thorough processes described in the following subsection are all intended as generalized ways to develop and provide adequate information to support informed judgements by the Board of Commissioners.

6.4 Implementation Program Alternative Approaches

The District has identified three generalized alternative models for developing the required information to support decision-maker action.

6.4.1 Proposed Projects and Other Direct Approvals

The most direct implementation of Management Plan requirements will arise when the District considers applications for Use Permits or other approvals. Such applications require that the District's staff review the application, carry out the procedural requirements of District ordinances and other state laws (e.g., CEQA), and recommend appropriate action for the consideration of the District's Board of Commissioners. The process that the District will follow in the future will be essentially the same as the process under current conditions; the basis of the District's consideration in the future will be the Management Plan.

In general, this implementation sequence for Plan elements arises when the District's decision-makers consider projects for which District approval is sought. The District's staff will review the project applications with respect to the Plan's policies, recommending action to the Board of Commissioners. The District will consider the proposed action's environmental effects, pursuant to CEQA requirements, and there will be opportunities for public and agency comment. Unlike the following two implementation sequences, this implementation alternative does not include seeking comments or opinions from members of the Advisory Committee.

6.4.2 District Procedural Requirements for Bay-Related Activities

The Management Plan includes a number of subject areas in which the District is committed to developing "procedures manuals" or "Blue Books" (e.g. a "shoreline protection manual" or another standardized approach to Bay management concerns). The intent is that the District should develop a set of standards for physical management activities that would function as a standard of review for such elements, including reviews by other agencies. In essence these adopted procedural guidelines would also function as Best Management Practices (BMPs).

Owing to the wide array of elements for which manuals of standard practices may be developed, the District will adopt a program for ranking the desirability of the practices manuals, utilizing the judgments of the Advisory Committee to assist staff and the Board in identifying and priority-ranking alternatives. The Advisory Committee will recommend priorities for staff development of the relevant materials. Upon concurrence by the District Board of Commissioners, District staff will develop the technical approaches, using assistance from other agencies and interested parties.

As procedures manuals are developed, District staff will present the manuals and appropriate supporting material to the District's Board of Commissioners for consideration and adoption. If appropriate, additional public reviews and/or environmental reviews will be conducted. When adopted by the Board, these procedures will become standards for District reviews of proposals made to the District, ongoing District activities and management actions for Humboldt Bay, and District interactions with other agencies about the Bay's management, thus implementing the Management Plan's policies.

6.4.3 Plans and Procedures Developed Jointly with Other Agencies

The Management Plan includes subject areas in which the policies direct that the District work collaboratively with other regulatory agencies to realize benefits jointly desired by the District and the other agencies (e.g., the development of a Bay-wide wetland enhancement or restoration plan, or the development and enactment of a memorandum of agreement that the District will act jointly with another agency to carry out a policy that covers a shared interest). Such actions may be carried out informally, and each of the agencies may simply adopt the resulting plan independently. In other cases, it may be more appropriate that the District and one or more other agencies formalize relationships necessary to develop the plan.

As with the development of procedures manuals, the District's staff will seek guidance from the Advisory Committee regarding the relative priorities for developing multi-agency plans for Bay management. Staff will present options to the Advisory Committee, requesting direction for Board consideration.

District staff will consult with the agency(ies) that share jurisdiction for the subjects of interest, seeking clarification regarding the degree of formality desired in the preparation of the plans. If necessary, staff will recommend to the Advisory Committee and the Board of Commissioners that the plans be developed formally, jointly with other involved agencies, allowing the agencies to provide their expertise to the plan development. In such cases the District may seek to develop memoranda of understanding or agreement (MOU/MOA) with the agencies that establish the roles of the respective agencies.

The Advisory Committee will consider the range of plans identified in the Management Plan and the recommendations of District staff, and will recommend priorities for appropriate plans, or for the development of MOU/MOA with relevant agencies. These Committee recommendations will be presented to the District's Board; upon direction from the Board, staff will undertake the plans or the development of the MOU/MOA. The details of plan or memorandum development are expected to differ according to the subjects involved and according to the concerns of the agencies involved; no simple protocol description is attempted.

The resulting plan, or an MOU/MOA leading to a plan, will be considered by the District's Board. If the Board of Commissioners authorizes an MOU/MOA, staff will seek execution of the agreement, and then will develop the plan under the resulting agreement.

When the plan that is the ultimate subject of the Management Plan's policy is completed, it will be presented by the District's staff for Board of Commissioners review and consideration and adoption. If appropriate, additional public reviews and/or environmental reviews will be conducted. When adopted by the Board, the plan will become a standard for District reviews of proposals made to the District, ongoing District activities and management actions for Humboldt Bay, and District interactions with other agencies about the Bay's management, thus implementing the Management Plan's policies.

6.5 Future Amendments and Plan Revisions

This Management Plan should be considered as a "preliminary" approach to Bay management. The District fully expects that within a period of three to five years that some hopeful approaches described in this chapter will need adjustment, revision, or even rescission. Additional policies that are not currently contemplated may appear, in time, to be essential. Consequently the District fully expects that this Plan will be amended or revised. This is intended as an implementation of the District's commitment to "adaptive management."

At the present time the District has not identified a formal methodology for initiating amendments. The District contemplates that District staff and Decision-makers will monitor the effectiveness of District operations, including interactions of staff and decision-makers with users, other agencies, and members of the public. The Plan Advisory Committee also will monitor the implementation of the Plan.

The District anticipates that revision of or amendment to this Plan be undertaken in a semi-formal sense, and it is presumed here that the District will develop an ordinance that specifies the procedure for adopting, and for subsequently amending, the Humboldt Bay Management Plan. The anticipated process generally resembles the implementation models described above, involving District decision-makers, staff, the Advisory Committee, applicants, other agencies, and the public. There will be ample opportunity for public review and comment, and an assessment of potential environmental consequences.

6.5.1 Compact Disc Contents

The compact disc enclosed with this Plan contains the following:

- Humboldt Bay Management Plan – Volume I – The Plan, May 2007
- Volume II – Appendices, July 2005
- Final Environmental Impact Report, August 2006
- Draft Environmental Impact Report, April 2006

Appendix A: Glossary of Selected Terms
Appendix B: District Enabling Legislation
Appendix C: State and Federal Implementing Entities
Appendix D: Regulatory Roles Who does What/Implementing Entities
Appendix E: Overview of Various Laws and Regulations Humboldt Bay
Appendix F: Partial Humboldt Bay Species Listing
- F-1: Selected Aquatic Invertebrate Species of Humboldt Bay
- F-2: Bird Species Identified in the Humboldt Bay Region
- F-3: Fish Species Identified in Humboldt Bay
- F-4: Algae and Salt Marsh Plant Species Identified in Humboldt Bay

Appendix G: Maps
Appendix H: Supplemental Documentation
- ▼ The Ecology of Humboldt Bay, California: An Estuarine Profile
- ▼ Classification of Wetlands and Deepwater Habitats of the United States
- ▼ Humboldt Bay Interpretive Signing Program
- ▼ South Spit Interim Management Plan
- ▼ Fish and Game Title 14: Section 550
- ▼ Preliminary Revision to Marine and Estuarine Habitats of the California Wildlife Habitat Relations System
- ▼ Humboldt Bay Draft Species Guides
  - ▲ Birds of Humboldt Bay
  - ▲ Humboldt Bay Fishes
  - ▲ Humboldt Bay Plants

Appendix I: Public Comments
Appendix J: Public Comments Received on the Humboldt Bay Management Plan Draft, March 2005

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