Subtidal Habitat Goals Project for Humboldt Bay and the Eel River Estuary

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Introduction and Background

Humboldt Bay and the Eel River Estuary waters contain diverse physical habitats including rivers, brackish and salt marshes, eelgrass meadows, tidal flats, large benthic areas of sand, mud and gravel, and sand and rock beaches. Nearshore ocean habitats include nearshore and offshore reefs and plains and submarine canyons. These habitats are affected by natural and human-induced factors including coastal development, sea level rise, complex oceanographic processes, dredging, levees, polluted run-off, diversions, and certain types of fishing gear. Subtidal habitats must be assessed, maintained and enhanced to support fisheries, wildlife, and recreational and commercial activities.

Subtidal habitats in Humboldt Bay and the Eel River Estuary have not been the focus of much research and consequently the location and abundance of habitats and their utilization by aquatic species are not well understood. This project will develop a comprehensive, long-term management vision for protection, restoration, and appropriate use of the subtidal system in the Humboldt-Eel River Estuary study area. The project will identify challenges and threats to the Humboldt Bay-Eel River Estuary ecosystem and provide a scientific basis to guide protection strategies, restoration and research priorities, and management policies of public resource agencies, as well as future decisions involving the preservation, enhancement, modification and use of subtidal habitats.

Project Location

Humboldt Bay is located about 275 miles north of San Francisco Bay and about 150 miles south of Coos Bay. Humboldt Bay is divided into 3 main areas; Arcata Bay to the north, central bay and south bay. Arcata Bay has extensive eelgrass beds, large expanses of tidal mud and sand flats, the City of Arcata and some small rural communities. Central bay includes the main shipping channel and port facilities, commercial and recreational fishing fleets, public and private marinas, the City of Eureka and two small rural communities. South Bay includes a commercial shipping dock, large expanses of tidal mud and sand flats, eelgrass meadows, a USFWS National Wildlife Refuge, beaches, and small rural communities. At high tide the surface area of Humboldt Bay is 24 square miles.

The Eel River Delta extends from Grizzly Bluffs and the confluence of the Van Duzen and Eel Rivers in the east, north of the Wildcat Ridges and south of Table Bluff. The Delta includes about 50 square miles (CDFG 1997). The Eel River Estuary, the fourth largest estuary in California, is composed of three main areas: the Eel River mainstem, North Bay and the Salt River. The tidal area of the estuary has been reduced by an estimated 3913 acres, (60%) due to reclamation for agriculture and sedimentation (SCS 1989). The tidal prism was reduced by approximately 40% since 1900. The estuary includes sloughs and side channels in the lower 6.8 miles of the Eel River below Fernbridge. The estuary area was estimated at about 4 square miles in 1970 (CDFG 1997). The Eel River mouth is about 10 miles south of Humboldt Bay. Very little is known about Eel River Estuary benthic habitats. The distinct habitats within the estuary need to be defined so that habitats critical for maintenance of the estuary species complex can be protected and restored. The processes that transport and deposit sediment from the Eel River mouth to the continental margin and Humboldt Bay have been relatively well studied by large collaborative research team (Parsons et al. in press). Land use in the Eel River Delta includes the urban development of four communities, gravel mining, grazing, timber harvest and milling, recreation and agriculture. A large project to excavate the Salt River will increase flood flow capacity and improve habitat conditions for listed salmonids, is in the planning stage and will be implemented over the next few years.

Project Need

Humboldt Bay and the Eel River Estuary are dynamic, urban, estuarine environments that provide important habitat for fish, waterfowl and other aquatic organisms and wildlife, and are a valuable commercial, recreational and aesthetic resource. While there is a general understanding of the value of different estuarine habitats and productive zones for plankton or pelagic organisms, there is not a good understanding of many of the features specific to this region and many gaps in knowledge remain concerning subtidal habitats and their utilization by aquatic species, especially concerning the Eel River estuary. Government agencies with authority over managing the estuary lack sufficient information on the subtidal habitats of the bay and a focused effort is needed in order to improve management of the bay's resources and development. The Subtidal Habitat

Goals Project will bring together numerous stakeholders working on resource protection and management of subtidal habitats in Humboldt Bay and the Eel River Estuary to develop a collaborative vision of the management goals for benthic areas. The project will also develop a coordinated approach to restoration and enhancement projects for the subtidal habitats in the study area.

The Subtidal Habitat Goals Project will provide information to the Humboldt Bay Ecosystem-based Management Program and lead to a more coordinated ecosystem approach to improve management, protection and restoration of subtidal resources. The project will also supplement recent plans such as the Humboldt Bay Management Plan and Linking Land and Sea: A Northern California Coastal Conservation Needs Assessment. Future projects may identify and implement projects based on this project. The report from this project will provide a useful resource for planners, managers, restoration groups, and researchers. We expect the report will be improved upon over the years as more information becomes available and as data sets become more complete.

Project Goals and Objectives

This project has four main goals: 1) identify, document, and describe subtidal habitats and their function, value and inter-intra-relationships within the study area. To that end, a map of benthic habitats in Humboldt Bay and the Eel River Estuary will be completed by the NOAA Coastal Services Center using digitized aerial photographs; 2) based on ongoing and emerging challenges in Humboldt Bay and the Eel River Estuary, develop subtidal habitat goals for management, protection, and enhancement based on best available scientific information and with input from scientists, resource managers, local governments, industry, fishermen, environmental organizations, recreational users, and the public; 3) identify, prioritize, and recommend research needs for understanding the subtidal habitats and the current level of impacts to these habitats; and 4) identify impact reduction, habitat enhancement, and restoration goals for subtidal habitats in Humboldt Bay and the Eel River Estuary and prioritize these opportunities within the estuary.

This project aims to develop goals and recommendations for restoration, management, use, and research of subtidal habitats of Humboldt Bay and the Eel River. This project develops a subset of information that will enhance the Humboldt Bay Ecosystem-based Management Program.

Objectives to achieve this goal are:

Part I – Create maps of subtidal habitats using existing data and new data sources (NOAA work will overseen by Advisory Committee)

- Assemble inventory of estuarine and marine habitat geospatial data sets (NOAA Coastal Services Center/Photoscience)
- Conduct aerial imaging and develop maps of selected habitat types or selected areas (CSC/Photoscience)
- Classify data to identify subtidal habitats using the Coastal and Marine Ecological Classification System (CMECS) (CSC/Photoscience)

Part II – Subtidal Goals Report Management Recommendations

- Describe subtidal habitats and with the best available science, determine their functional values
- Select subtidal habitat conservation targets based on species, communities, genetic diversity, ecological systems, distribution or other factors
- Identify major threats to subtidal habitats
- Identify jurisdictional or regulatory challenges
- Develop subtidal habitat goals for target habitats
- Identify, prioritize and recommend research needed for improved understanding and management of subtidal habitats
- Identify habitat enhancement and restoration opportunities
- Prepare a report on subtidal habitats of Humboldt Bay and the Eel River Estuary

Roles and Responsibilities

Project Administrator and Project Staff

- Organize Subtidal Habitat Goals Advisory Committee (AC)
  - Assemble Advisory Committee with broad expertise in ecology, conservation biology, data analysis and management, and socioeconomic capacity
  - Arrange for venue, speakers and travel for all meetings
  - Develop agendas
  - Track progress of meetings
  - Provide meeting notes and documents as needed
- Communication
  - Provide regular updates to the EBM core group, and seek review when necessary
  - Keep agencies not represented on AC up to date on project
  - Engage stakeholders throughout the process through open AC meetings, website and by attending other meetings and seeking input
- Maintain program website
  - Disseminate meeting notes via website, email and other methods as needed
  - Post relevant reports, documents, maps and other materials are available to project participants, stakeholders and others.
- Prepare Subtidal Habitat Goals report
  - Create draft report and distribute to AC for review
  - Circulate revised report for external peer review, including EBM core team
  - Respond to peer review comments and review with AC
  - Hold public meeting to solicit comments on report

Advisory Committee Responsibilities

- Assess Photoscience subtidal data collected and maps prepared
- Based on data collection efforts in the summer of 2007, determine the planning timeline for completion of the project
- Define subtidal habitats for Humboldt Bay and Eel River Delta
- Determine the functional relationship of and between habitats
- Define subtidal habitat and biodiversity targets for Humboldt Bay and Eel River Delta
    - Targets may be based on substrate, area, species, communities, vegetation, ecological systems, or other criteria
    - Targets for subtidal habitats will be assessed for level of knowledge of various biological and physical scales
- Recommend indicators of successful management or restoration
- Set goals for subtidal habitat targets
    - Identify and analyze impacts and stresses to subtidal habitat targets
- Identify data gaps
- Identify stressors and jurisdictional conflicts on subtidal habitats
- Create Subtidal goals
    - Recommend data analysis or research still needed to better understand subtidal habitats
    - Recommend protection and enhancement measures needed
    - Make management recommendations
- Assist Program Administrator with identifying resources and invited expert speakers for Advisory Committee meetings

The products of the Subtidal Goals Project will include the following:

1) A report on the subtidal habitats of Humboldt Bay and the Eel River Estuary summarizing existing information on the historic and current state of subtidal habitats in the estuary. The report will outline recommendations and goals for protection, restoration, and needed research to improve subtidal habitat management of Humboldt Bay-Eel River Delta.

2) Website with data, reports and accessible mapping products that provide all available information about subtidal habitats Humboldt Bay and Eel River Estuary. For example, products may include maps of habitat distribution and abundance, general areas and types of commercial and recreational use, information on restoration activities and opportunities, and/or links to pertinent regulatory information.

Literature Cited

CDFG (California Dept. of Fish and Game) 1997 Eel River Salmon and Steelhead Conservation Plan Final Review Draft. January 28, 1997.

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SCS (Soil Conservation Service) 1989. Salt River watershed plan workplan, including the Lower Eel River, Delta and Estuary workplan. SCS, Eureka, California.