

Analysis of Fundamental Resources and Values

2.1 Marine Influences-- Oceanic conditions such as tides, currents, waves, surf, upwelling and sea level influence the coastal environment including weather, climate and the land.

Importance of Resources and Values

Horizontal and vertical movements of water along the coast vary by season and bring changes in local weather and climate such as fog. These conditions also lead to the seasonal appearance of upwelling which brings nutrient-rich waters to the sunlit zone resulting in one of the five most productive marine environments in the world. The seasonal changes in coastal current patterns create dynamic beaches and dunes through the coastal erosion and transport of sand.

Current Conditions and Trends

The Golden Gate represents the largest topographic break along the coast allowing warm air from the interior of California to mix with cooler oceanic air from the Pacific. This key location extends the moderating influence of the ocean inland for more than a hundred miles. Strong upwelling conditions that occur typically from April through July exert a major influence on biotic life along this coast. Notable wildlife species such as harbor seals and common murres are supported by the high productivity afforded by the area's upwelling. Littoral transport occurs typically from the north to south, depositing materials in submerged bars and deep channels, creating a diverse array of submerged habitats. The dynamic nature of coastal beaches is formed by seasonal deposition and erosion of materials; with episodic winter storms from the south leading to major coastal erosion and landform changes. Ocean conditions are responsible for fog that shape vegetative communities along the coast.

Long-term trends in marine influences are characterized by global patterns including rising sea levels and water temperatures. Increased population growth and development may result in alteration of marine physical processes including continued changes to the nature, timing, and amount of freshwater inputs into the Pacific Ocean from the watersheds contributing to the San Francisco Estuary. Maintenance of coastal roads such as Highway One within park boundaries and development activities adjacent to park boundaries may accelerate coastal erosion or result in engineered bank protection.

Threats and Issues

Sea level rise would result in the loss and conversion of intertidal resources and will result in actions by the neighbors and possibly the Park to protect infrastructure that may alter natural shorelines (e.g., increased rock shoreline protection). Rising water temperatures could lead to decreased productivity in coastal waters and shift fishery

communities towards warm-water species. A change in species usage of coastal waters may also result from the reduction in frequency, volume, extent of freshwater flows into the Pacific Ocean. Continued manipulation of the subtidal habitats from commercial sand dredging could reduce the extent of bars and result in the loss of sand materials for littoral transport and beach development. Continued use of parking facilities, roads and other infrastructure within the Park adjacent to coastal waters may result in unnatural actions to protect them.

Interest of Various Stakeholders

Local/regional:

- California Department of Fish and Game (local lead for marine protected areas)
- Univ. of California marine research institutions (Bodega, Long, Moss Landing, Romberg-Tiburon)
- Other research institutions (San Francisco Estuary Institute, Californial Academy of Science, Smithsonian)
- California Seagrant
- Marine resource advocacy groups (various- Bay Institute, Baykeeper)
- Farallones Marine Sanctuary Assoc.

National:

- Surfrider
- Gulf of the Farallones/Monterey Bay National Marine Sanctuary
- Center for Marine Conservation
- Seaflow (marine soundscape)
- Ocean alliance (marine conservation)
- U.S. Coast Guard
- U.S. Geological Survey (research)
- U.S. Army Corps of Engineers/U.S. EPA (Clean Water Act, River and Harbors Act implementation)

Educational:

- Headlands Institute (non-profit GOGA partner)
- Golden Gate National Parks Conservancy (non-profit GOGA partner)
- YMCA (non-profit GOGA partner)
- Discovery Museum (non-profit GOGA partner)
- California Academy of Science

Law and Policies

- 1) Sanctuary Act
- 2) Coastal Zone Management Act of 1972
- 3) Rivers and Harbor Act
- 4) McAtter-Petris Act (governing non-federal lands in the Bay)

5) Various NPS policies

Policy Direction

Recent acts (e.g. Coastal zone management act) aided in slowing coastal development adjacent to park boundaries and continue to prevent uncontrolled coastal impacts. Sanctuary Act prohibits discharges and disturbance of the seabed within the Sanctuary waters.

Management Direction

SOURCE: NPS Management Policies 2001

Sec 4.1.5 (Restoration of Natural Systems)

- The Service will re- establish natural functions and processes in human- disturbed components of natural systems in parks unless otherwise directed by Congress.

Sec 4.8.1.1 (Shorelines and Barrier Islands)

- Allow natural shoreline and marine processes to continue without interference.
- Where human activities have altered natural shoreline/marine processes, investigate alternatives for mitigating the effects and restore natural conditions.
- Strive to understand, maintain, restore and protect the inherent integrity of marine influences