

DRAFT Problem Statement for Loma Alta Slough

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Under Section 303(d) of the Clean Water Act (CWA), states are required to identify waters whose beneficial uses have been impaired due to specific constituents. Loma Alta Slough (Estuary) was placed on Section 303 (d) list of Water Quality Limited Segments in 1996 for eutrophic conditions and indicator bacteria with an estimated area affected of 8 acres. To meet water quality standards, the Estuary is subject to the development of a total maximum daily load (TMDL). (USEPA, 2009)

The Estuary is a small coastal estuarine wetland located at the mouth of Loma Alta Creek in Buccaneer Beach Park and is entirely within the City of Oceanside in north San Diego County, California. The Estuary has intermittent connection to the Pacific Ocean but is normally blocked off from the ocean by a sandbar during the dry season by the City of Oceanside to avoid contaminating adjacent beaches and the ocean with elevated bacteria concentrations. Along with the saltwater contributions, the Estuary receives freshwater inputs from an approximately 6,300-acre watershed which is over 95 percent within the City of Oceanside. The Loma Alta Creek watershed is a low-lying coastal area that extends approximately seven miles east of the Pacific Ocean to an elevation of over 400 feet.

The Estuary provides refuge, foraging areas, and breeding grounds for several threatened and endangered species as well as coastal marine species. The Estuary and Creek also serve as habitats for approximately 100 species of wildlife including the federally threatened California gnatcatcher, migratory birds, and raptors. (City of Oceanside, 2003)

Water Quality Objectives

The San Diego Basin Plan states for indicator bacteria, "In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200/100 milliliters (ml), nor shall more than 10 percent of total samples during any 30-day period exceed 400/100 ml. In bays and estuaries, the most probable number of coliform organisms in the upper 60 feet of the water column shall be less than 1,000 per 100 ml (10 per ml); provided that not more than 20 percent of the samples at any sampling station, in any 30-day period, may exceed 1,000 per 100 ml (10 per ml), and provided further that no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 per 100 (100 per ml). The USEPA freshwater Enterococci criteria for water contact recreation is 33/100ml for geometric mean, 61/100ml for single sample maximum and for saltwater Enterococci is 35/100ml for steady state and 104/100ml for single sample maximum. The freshwater E.coli criteria are 126/100ml for geometric mean and 235/100ml for single sample maximum. (Basin Plan, 1994)

The San Diego Basin Plan states for eutrophication, "Excessive growth of algae and/or other aquatic plants can degrade water quality. Algal blooms sometimes occur naturally; however, they are often the result of waste discharges or nonpoint source pollutants. Algal blooms depress the dissolved oxygen content of water and can result in fish kills. Floating algal scum and algal mats are an aesthetically unpleasant nuisance. This general condition is known as eutrophication. Inland surface waters, bays and estuaries and coastal Estuary

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waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.

Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold total phosphorus (P) concentrations shall not exceed 0.05 mg/l in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. Inland surface waters shall not contain biostimulatory substances in concentrations in excess of the numerical objectives described in the Basin Plan (1994).

Beneficial Uses

Beneficial uses listed in the basin plan for the Estuary include contact water recreation, non-contact water recreation, estuarine habitat, wildlife habitat, rare, threatened or endangered species, and marine habitat. The beneficial use most sensitive to increased indicator bacteria is contact water recreation. Contact water recreation impairment is not actually caused by the indicator bacteria agents, but rather, they “indicate” the presence of fecal material and associated disease-causing pathogens, which are recognized as the impairing pollutant. Indicator bacteria have been historically used as surrogates for pathogens because they are much easier and less costly to measure than the pathogens themselves.

Impacts associated with eutrophication include impairment to aquatic life, aesthetics, low dissolved oxygen, and increased turbidity. Eutrophication can impact several of the Estuary’s designated beneficial uses, including estuarine habitat, warm freshwater habitat, marine habitat, wildlife habitat, and rare, threatened, or endangered species. The most significant beneficial use to consider with regard to eutrophication impacts to Loma Alta Slough are estuarine habitat and warm freshwater habitat, because of the organisms associated with these habitats that are living within the estuary when the mouth is closed, which is when environmental conditions are the most stressful. (Basin Plan, 1994) The RARE designation refers to the California gnatcatcher. Rare, threatened, or endangered aquatic species are not found in Loma Alta Slough. (Katie Zeeman, USFWS, (pers. comm.)

Water Quality Management

The Loma Alta Creek Watershed Management Plan, San Diego Basin Plan, and Clean Water Act Section 303(d) highlight indicator bacteria and eutrophication as a significant impact associated with urban development and a leading cause in the impairment of water

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quality and salt marsh habitat in the Estuary, making indicator bacteria and eutrophication reduction a management priority.

The Estuary's wetland habitats cover 107 acres and include freshwater, marsh, mule fat scrub, and southern willow scrub. The environmental processes that support estuarine and wetland habitats have been altered by urban development with an increase in volume of freshwater, an increase in runoff rates due to increased impervious cover, and an increase in nutrient loading.

The management for both bacteria and eutrophication in Loma Alta Slough can lead to opposing decisions to remedy each problem. Buccaneer Beach, which is adjacent to the mouth of Loma Alta Slough, is a popular swimming beach. The mouth of the Slough is managed so that it is closed during the swimming season to prevent bacterial contamination to the beach from the Slough and watershed. However, this management plan is detrimental to the Estuary in that the standing water does not circulate, and additional freshwater inflows from the watershed provide increased loading of nutrients. These conditions lead to excessive algae growth and biomass and low dissolved oxygen in the Estuary. However, reducing the loading of both bacteria and nutrients from the watershed will reduce the need for concern regarding the management conflicts with the mouth of the Slough.

Many water quality and beneficial use problems are best solved by considering entire watersheds. Loma Alta Creek is characterized as a typical urbanized waterbody with 70 percent of which is developed. Almost 90 percent of the land within the watershed is privately owned, parks, recreation, and open space cover 314 acres within the watershed, and agriculture covers 92 acres within the watershed. Much of the creek has been modified throughout the years, with the use of fully or partially concrete-lined channels to stabilize the creek-bed slopes and control flood. Land use changes and hydrological modifications to the watershed have led to increased amounts of nutrients, bacteria, and other contaminants to the Estuary. Urban runoff and physical modifications to water bodies are now considered the greatest remaining threats to water quality and beneficial uses. (City of Oceanside, 2003) (SCCWRP, 2010) (SDRWQCB, 2002)

Excess indicator bacteria and nutrient loading has caused impairment of the Estuary. Developing eutrophication and indicator bacteria TMDLs for the Estuary is critical to the restoration of all beneficial uses of the Estuary, including the estuarine beneficial uses most impacted by indicator bacteria and eutrophication.

References

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