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CHAPTER 3: TERRESTRIAL SOILS

Ballona Wetlands Ecological Reserve, Los Angeles, California
Santa Monica Bay Restoration Commission

Prepared for: California State Coastal Conservancy
June 2012

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TERRESTRIAL SOILS

INTRODUCTION

Human activities pose considerable risks (Hooper and Anderson 2009) and impacts (Cardelli et al. 2012) to soil systems, so it is important to understand the influences of those activities on the environment. During the first baseline year, the Baseline Assessment Program (BAP) conducted the first comprehensive ecologically-based surface terrestrial soil survey across the Ballona Wetlands Ecological Reserve (BWER). Terrestrial ecotoxicity was assessed by determining phytoavailable constituents of concern (Kabata-Pendias 2004, NOAA 2010) within BWER soils across the site, comparing these trace elements across habitat types, and evaluating the constituent values against ecological soil criteria for plants (EPA 2005).

During the second baseline year, the goals of the terrestrial soil assessment expanded to include additional parameters that would provide information on pre-restoration conditions of the BWER. These goals included assessing carbon sequestration and analysis of stratification of carbon and other organic matter within cores in disturbed and undisturbed habitats. However, due to permit modifications and restrictions by the California Department of Fish and Game, these surveys were not undertaken during the second baseline year. Pending approval, they may be added in a subsequent monitoring year.

RESULTS

Results for the carbon and organic matter surveys were not completed within year two. For a complete description of the first year ecotoxicity surveys and results, see Chapter 3: Terrestrial Soils from the first Baseline Assessment Report: 2009-2010 (Johnston et al. 2011) and associated appendices (B.2 and B.3).

FUTURE DIRECTIONS

Additional soil surveys along transects surveyed in the first baseline year are proposed for subsequent monitoring years. These surveys would include different parameters such as soil moisture, salinity, grain size, texture, and total organic carbon. These soil properties provide additional information about the quality of the terrestrial soils and some may act as indicators of denitrification processes (Burford and Bremner 1975) and additional ecosystem functions (i.e. organic matter) (Franzluebbers 2002, Carter and Gregorich 2008).

Pending funding availability, future surveys may also include plant tissue analyses for trace metals along the same transects as the soil surveys. This will allow a comparison of the phytoavailability of metals in the surface soils and the uptake by dominant plant species along the transects.

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