Technical Report 0671

# Historical Ecology of the Ballona Creek Watershed

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## EXECUTIVE SUMMARY

Looking across the vast urbanized landscape in the Los Angeles Basin, it is almost impossible to imagine the natural landscape prior to human development. The remaining wetlands leave only a few clues about the past wetland complexes in this region. Nevertheless, the past is vital to understanding the foundation of landscape-processes, historical wetland distribution, and human impact that lend to a better understanding of sustainable restoration plans within the constraints of the contemporary landscape.

The primary goal of this project was to identify the characteristics of historical wetland habitat types and describe the historical form of major creeks in the Ballona Creek watershed. Our target time period was 1850-1890, just prior to contemporary impacts but after the migration of the Los Angeles River, which fundamentally altered the hydrology and morphology of the watershed. It is also a time period that is relatively data rich associated with information compiled around the time of statehood. We set forth to answer the following questions:

1. What was the extent (acreage) of persistent riparian, wetland, and associated floodplain habitat in the Ballona waterhshed?
2. What were the predominant types of wetlands in the watershed and what was the spatial distribution of these wetlands within the watershed?
3. What potential resources are available for stakeholders and scientists wanting to pursue further and more detailed research on this watershed?

Conclusions about historical wetland composition, extent, and distribution were based on a "weight of evidence" approach. Over 300 documents were compiled from 84 source institutions and organized through a metadata catalogue. Data sources were digitized, georeferenced, and organized by subregions within the study area. Spatially referenced datasets were overlaid and augmented by textual citations, photographs and other non-geospatial data. The concordance between multiple data sources allowed us to draw conclusions that supported inferences about historical conditions. We assigned a certainty rating for interpretation, shape/size, and location of each polygon mapped based on the number and quality of corroborating pieces of evidence. Finally, historical herbaria records and bird observations were used to provide insight into the composition of historical plant communities.

### Extent and Type of Wetlands in the Ballona Watershed

The Ballona watershed supported a great diversity of wetlands during the mid-late 19th century (figure es-1). The La Cienega wetlands and the Ballona Lagoon complex accounted for the majority of wetland area in the watershed. Various freshwater ponds, vernal pools, wet meadows, freshwater marshes and numerous springs were found throughout the watershed. We mapped 174 unique wetland polygon features comprising 14,149 acres. The dominant wetland types included alkali meadow (35%), valley freshwater wet meadow (10%), valley freshwater marsh (10%), brackish to salt marsh/tidal marsh (9%), and alkali flats (8%; table es-1).

| HABITAT CLASSIFICATION | UNIQUE WETLANDS | ACRES | HECTARES |
|---|---|---|---|
| ALKALI FLAT | 5 | 1284 | 486 |
| ALKALI MEADOW | 21 | 5273 | 1915 |
| BEACH | 2 | 159 | 64 |
| DUNE | 8 | 187 | 76 |
| OPEN WATER* | 8 | 96 | 39 |
| PERENNIAL FRESHWATER POND | 8 | 110 | 45 |
| SALT FLAT/TIDAL FLAT | 15 | 423 | 171 |
| SALT MARSH/TIDAL MARSH | 20 | 1240 | 498 |
| VALLEY FRESHWATER MARSH | 35 | 1356 | 547 |
| VERNAL POOL | 15 | 260 | 105 |
| WET MEADOW | 24 | 3336 | 1351 |
| WILLOW THICKET | 13 | 425 | 173 |
| TOTALS | 174 | 14149 | 5470 |

*DOES NOT INCLUDE PACIFIC OCEAN

***TABLE ES-1:***
*Summary of wetlands mapped on the Ballona Historical Ecology project.*

We mapped 232 miles (373 km) of historical stream channels in the study area. Approximately 80% of the stream channels were intermittent (often discontinuous) washes. Across the valley floor most of the streams sank into porous soils or spread into the major wetland complexes of La Cienega and the Ballona Lagoon. This characteristic likely contributed to a significant amount of subsurface water flow and to the vast wetland complex at La Cienega. The exceptions were Ballona and Centinela Creeks, which were perennial streams lined with willow woodlands. Both streams provided freshwater input to coastal wetlands of Ballona Lagoon.

Freshwater seeps and springs were a characteristic feature of the Ballona Watershed. Although springs were present at a few locations throughout the Ballona Valley, 70% of the 45 mapped springs in the watershed were found in the Santa Monica Mountain foothills. These springs were clustered in the foothills and stopped abruptly at Franklin Canyon. This distribution could be the result of fault displacement or geologic composition. These springs played a notable role in downstream hydrology, where in several locations freshwater wetlands formed at their confluence (particularly in Rodeos de las Aguas near present day Beverly Hills). Many of these springs persist today and are unique remnant features from the historical landscape.

### Data Products

In addition to this summary report, we developed several products designed to make the data compiled through this effort more readily available for exploration and use. Once collected, photographs, maps, and textual data were uploaded into an online metadata catalog. The catalog provides a means to organize and query historical documentation by spatial location, wetland descriptions, time period, and source. Bibliographic tables and information about source institutions may also be downloaded from this online database creating a secondary product for stakeholder use. This type of database creates a dynamic tool for the discovery of new information and allows for the creation of different hypothetical questions that can be explored by future researchers. The metadata catalogue, an associated geodatabase with spatially explicit data, raw data tables, and this summary report can be viewed and downloaded from **www.ballonahe.org**.

The contemporary Ballona watershed represents unique opportunities for restoration planning. The information in this report should provide a foundation for understanding the functional relationships of the various wetland complexes, lend support to the development of sustainable restoration plans, and facilitate consideration of natural landscapes into future planning for infrastructure and stormwater management.

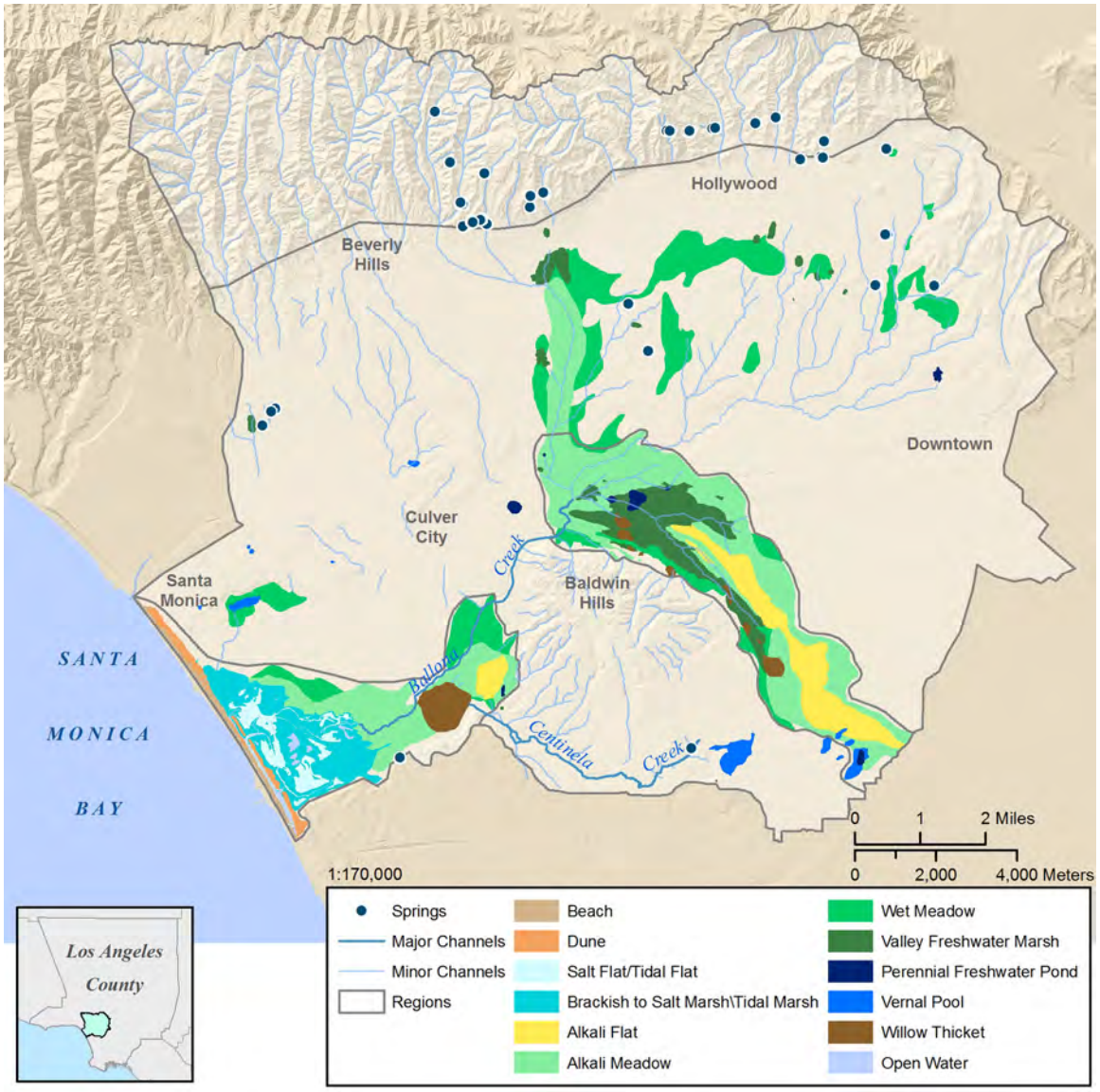


**FIGURE ES-1:** *Distribution of wetlands and associated features within the Ballona Watershed (1850–1890).*

**Full Text**
ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/671_BallonaHistoricalEcology.pdf