New Understanding: The Baylands and Climate Change
Appendix B: Change in the Extent of Baylands Habitats

CHANGE IN THE EXTENT OF BAYLANDS

For the Update, change in the distribution and abundance of baylands habitat types was estimated using the EcoAtlas data sets for 1800 and 1998 from the 1999 Goals report, the new Bay Area Aquatic Resource Inventory (BAARI) 2009 data, and input from restoration experts to create a picture of likely future restoration (i.e., those projects with funding and permits in hand). Mapping discrepancies were standardized as much as possible and Baylands habitat types were cross-walked to the best accuracy possible (Table B1). Given the need to cross-walk the habitat types among the different mapping efforts, some calculations are slightly different here than in the 1999 Goals report. Baylands habitat extents were summarized at the regional and subregional scales and included tidal marsh, tidal flat, managed ponds, non-tidal wetland, channel, and agriculture/development/other land uses.

Table B1. Cross-walk of Baylands habitat types in 1999 and 2014 Baylands Goals

1999 Goals Report	2015 Goals Update
Other	Developed/ Agriculture/Other
Bay Fill	
Agricultural Baylands	
Diked Wetland	Non-tidal Wetland
Salt Pond	Managed Pond
Tidal Marsh	Tidal Marsh
Tidal Flat	Tidal Flat

1880-1998

As documented in the Goals report (1999), extensive tidal marsh (150,000 acres or 79%) and tidal flat (20,000 acres or 40%) were lost to diking and filling from 1800 to 1998. Managed ponds, non-tidal

wetlands, agriculture and developed areas increased in extent as a result of conversion from the historic tidal wetlands to agriculture, salt production, and urbanization.

In late 1980's through the 1990's, the restoration community began to turn the tide on tidal habitat loss through the completion of some early projects, notably Napa-Sonoma Pond 2A, Ryer Island in Suisun Bay, Cogswell Marsh and Whale's Tail on the East Bay Shoreline, Muzzi Marsh in Marin County, and New Chicago Marsh in the South Bay. Restoration projects completed by the year 1998 added 4,000 acres of tidal marsh and 2,000 acres of non-tidal wetlands.

1998-2009

Projects completed from 1998--2009 restored 13,000 acres of the Baylands. There was minimal conversion of developed areas; instead restoration projects focused on breaching diked habitat, allowing tidal waters to return non-tidal wetlands and ponds to tidal marsh and tidal flat. The two largest efforts—Napa-Sonoma and South Bay Salt Ponds—along with other smaller-scale efforts continued to restore or enhance a number of managed former salt ponds. Ponds 3, 4 and 5 in Napa-Sonoma were breached to allow tidal access, and by 2009 had patches of nascent marsh. Similarly, the Island Ponds (A19, A20, A21) in the South Bay were breached in 2006 and now have nascent or established tidal marsh vegetation. Other notable tidal marsh restoration projects completed during this time include the Eden Ecological Reserve Restoration, portions of Bair Island, and Cooley Landing. Parts of the South Bay Salt Pond Restoration Project in Eden Landing (Ponds 1, 6A, 8, and 10) and Ponds A18 and A2W in Alviso, as well as Pond 2A in Napa-Sonoma have been maintained or enhanced for wildlife. Many valuable smaller restoration projects also contributed to the increased acreage.

In all, restoration, mitigation, and enhancement projects completed by 2009 increased tidal marsh by 3,000 acres and tidal flat by 5,000 acres. A total of 5,000 acres of non-tidal wetlands and managed ponds were also created or enhanced. However due to conversion to tidal habitats, the overall acreage of these habitats decreased by 8,000 and 3,000 acres, respectively. Though the acreage decreased, non-tidal wetlands and managed ponds still represent 64% of the total wetland habitat in the Baylands. There was no significant change to the amount of developed baylands during this period.

2009-Planned Future Restoration

Planned future projects will add around 30,000 acres of tidal marsh and 1,000 acres of tidal flat to the Baylands. Although 4,000 acres of managed ponds are planned for restoration or enhancement, the overall extent of managed pond will be reduced by 9,000 acres. Similarly, 5,000 acres of non-tidal wetlands are to be created or enhanced, while overall non-tidal wetland extent will decrease by 10,000 acres. Also, several thousand acres of previously restored tidal flat will convert via natural accretion to tidal marsh. These planned restoration projects will implement the first significant conversion of developed lands (non-wetlands) to tidal and non-tidal wetlands.

The largest contributions to the future increase in tidal wetlands are from the Napa-Sonoma Marsh and South Bay Salt Pond Restoration projects. Other anticipated restoration projects contributing to the planned increase in baylands habitats include Montezuma and Hill Slough in Suisun Bay; Hamilton, Bel

Marin Keys, Sears Point, and Skaggs Island in the North Bay; and additional sections of Bair Island in the South Bay.

Restoration, enhancement, or mitigation projects that have been funded, permitted or both and therefore have a high probability of completion within the next 20–30 years have been included in this estimation of future baylands habitat. The estimated acreage of these anticipated projects (construction completed after 2009) was taken from the San Francisco Bay Joint Venture and San Francisco Estuary Institute project tracking databases and further vetted with regional restoration managers to incorporate the best understanding of expected habitats that will be created through these projects.

Due to uncertainty in estimating expected habitat acreage from planned restoration projects, and uncertainty in the accuracy of the existing spatial data, certain assumptions were made for this analysis. First, the project tracking databases provide a list of one or more planned habitat types, but usually not the acreage for each one. If one habitat type was listed, the entire restoration project extent was allocated to that type. If more than one habitat type was listed, then the restoration area was evenly allocated to each habitat type. The placement on the map of multiple habitat types within a project was arbitrary, as this information is also not available in the databases. At times, restoration project data did provide estimated acreages for each habitat types. In these cases, those acreages were used in the analysis. Restoration managers reviewed the preliminary estimates and provided improvements to the database where needed for more accurate analysis. These refined restoration data were overlaid on the BAARI 2009 map and replaced the 2009 habitats for quantification and display. Thus, this estimate of future baylands habitat is based on updates to current habitat maps with general restoration information. It is neither a modeling exercise nor a predictive analysis, and it does not include the effects of sea-level rise or other impacts due to climate change.