

## Appendix B. Pajaro Compass Spatial Data Sources

We compiled data primarily from publicly available datasets and clipped the data to the Pajaro River watershed. We prioritized collection of data layers that were identified as critical or important to include by the partnership (Appendix A, Table A1). We collected data

on resources in the watershed that together represent the six conservation themes: water resources, biodiversity, agriculture, carbon and soil health<sup>1</sup>, recreation, and community. Finally, we collected data on current and planned land-use, climate, land status, policies, as well as projects that could either beneficially or detrimentally influence these resources. These data layers are all available in the [Pajaro Compass Webmap](#).

**Table B1.** Spatial data sources used for Pajaro Compass themes.

Theme	Value	Source	Date	Details
Water	Floodplain	FEMA		100 year floodplain; 10 year floodplain.
Water	Riparian Corridor	EPA/TNC  NHDPlus	2012	Active River Area as in the California Integrated Assessment of Watershed Health showing: material contribution areas, meander belt, floodplains, terraces, riparian wetlands.  Divided into perennial and intermittent using NHDPlus.
Water	Flood Frequency	NRCS SSURGO	2015	The annual probability of a flood event expressed as a class (dominant flood frequency class for the map unit, based on composition percentage of map unit components whose composition in the map unit is equal to or exceeds 15%)
Water	Groundwater Recharge Areas	DWR	2000	Hydrogeologically Vulnerable Areas compiled for Exec. Order D-5-99. Mapping of aquifer vulnerability.
Water	Groundwater Basins	DWR	2014	The CASGEM Groundwater Basin Prioritization (Basin Prioritization) is a statewide ranking of groundwater basin importance that incorporates groundwater reliance and focuses on basins producing greater than 90% of California's annual groundwater.
Water	Groundwater Recharge	Flint <i>et al.</i> USGS	2014	USGS BCM Model at 270m based on 30 year historic data summary.
Water	Runoff	Flint <i>et al.</i> USGS	2014	USGS BCM Model at 270m based on 30 year historic data summary.
Water	Wetlands	National Wetlands Inventory (NWI)	2014	US Fish and Wildlife Service maps of the extent, approximate location and type of wetlands.
Water	Water Quality Index	California Integrated Watershed Assessment (EPA)	2013	NHD Catchment level index, based on conductivity, turbidity, and nitrate concentration.

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<sup>1</sup> Although the identified conservation goals determined by the stakeholders included a goal around carbon and soil health, the spatial analysis only addresses carbon stock. Because carbon stock provides a direct link to Climate Change and Carbon Stock—a primary focus identified in the Pajaro Compass Network survey—it was the sole focus of this theme in the maps and tools. The spatial analysis does not include data or metrics related to soil health. The carbon and soil health theme section discusses both.

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Theme	Value	Source	Date	Details
Biodiversity	Connectivity	Bay Area Critical Linkages (SC Wildlands,	2013	Critical Linkages were modified by local permeability to only show areas with limited local permeability that are important in a regional connectivity context (0.7 threshold).
		BAOSC) Local Permeability (TNC)	2015	Local permeability shows the proportion of a 3km neighborhood that is accessible based on resistance from transportation and energy infrastructure, housing density and land cover.
Biodiversity	Species Richness	Habitat suitability weighted richness (TNC)	2015	FVEG2015 vegetation types at 30m linked to CWHR (CDFG) 2015 species habitat relationships and CWHR range maps for ~700 species.
Biodiversity	Threatened and Endangered Species Richness	T&E Habitat suitability weighted richness (TNC)	2015	FVEG2015 vegetation types at 30m linked to CWHR (CDFG) 2015 species habitat relationships and CWHR range maps for a subset of threatened and endangered species.
Biodiversity	Rare Species	CNDDDB Density (DFW,TNC)	2015	CNDDDB filtered to recent higher quality occurrences and weighted by accuracy and rarity/status with richness calculated within 1km.
Biodiversity	Rare Vegetation	CGAP USGS	2008	18 vegetation types from CGAP identified as statewide rare vegetation by TNC.
Biodiversity	Aquatic Biodiversity	California Freshwater Assessment (TNC)	2014	Species Richness for all aquatic species and Imperiled Species Richness by HUC12 watershed.
Biodiversity	Historical Ecology	SFEI—Alomon <i>et al.</i>	2015	Combination of 3 data sources, where there was overlap, the data was used in the following priority order: 1) SFEI -Geospatial data describing the historical conditions of Santa Clara Valley 2) VTM 3) Digital version of the 1945 California Vegetation Type Maps by A. E. Wieslander of the U.S. Forest Service. Source scale of maps are 1:100,000.
		VTM—Kelley <i>et al.</i>	2005	
		Weislander 1945 hosted by California natural resources agency	2015	
Biodiversity	Habitat	FVEG	2015	Conifer or Deciduous Forest or Woodland. Grassland.
		CNDDDB	1997	Sycamore Alluvial Woodland.
Biodiversity	Abiotic Habitat	Serpentine Soils		
Biodiversity	Wetlands	National Wetlands Inventory (NWI)	2014	US Fish and Wildlife Service maps of the extent, approximate location and type of wetlands.
Biodiversity	Seeps and Springs	USGS, EPA (NHDPlus18)	2015	

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Theme	Value	Source	Date	Details
Agriculture	Farmland	Farmland Mapping and Monitoring Program (FMMP)	2012	FMMP is a combination of soil ratings and current land use.
Agriculture	Historically farmed land	Farmland Mapping and Monitoring Program (FMMP)	1986-2012	All farmland of state or local importance, and prime or unique farmland was identified from 1986-2012 and then screened for current farmland or urban development.
Agriculture	Rangeland	FMMP FVEG	2012 2015	Combined FMMP classified as Rangeland and FVEG CWHR classes as rangeland according to Cameron <i>et al.</i> 2006
Carbon	Above Ground Carbon	Gonzalez et al.	2010	30m. Carbon density for 2010 (Mg ha <sup>-1</sup> ).
Carbon	Below Ground Carbon	gSSURGO Soil Carbon	2015	10m. Organic carbon stock estimate (SOC) measured for 0-30cm depth (C g/m <sup>2</sup> ).
Recreation	Public Access	CPAD/CCED	2014	Protected areas with public access.
Recreation	Trails	Greenbelt Alliance, National Geospatial-Intelligence Agency		Bay Ridge Trail, Juan Bautista de Anza National Historic Trail (Greenbelt)  VMAPI (NGA).
Community	Agricultural Tourism	UC Agrotourism Directory	2016	County Crossroads Farm Trail farms and vineyards with on-site stands and stores.
Community	Cultural Resources	Amah Mutsun	2016	Cultural resources
	National Historic Registry	National Historic Registry	Accessed 2016	Registered Historic Sites and Buildings.
	El Camino Real Historic Trail	CyArk	Accessed 2016	Historic road clipped to Pajaro River watershed.

**Table B2.** Spatial data sources used for Pajaro Compass regional influences.

Influences	Type	Source	Date	Details
Urban Expansion	Projected Urban Growth	Thorne - UPlan	2012	100m. Urban and rural growth projected to 2050—BAU scenario.
Urban Expansion	Current population	U.S. Census	2010	By census blocks.
Urban Expansion	Williamson act non-renewals	California Department of Conservation Division of Land Resource Protection (DLRP)	2012	Non-renewals of enrollment in voluntary restriction of land-use to agricultural uses.
Urban Expansion	Rangeland conversion to urban	Cameron <i>et al.</i> , TNC	2014	Change in FMMP rangeland from earliest FMMP to 2006-2008.
Community	Distance to schools		2000	Euclidean distance in meters (10m) to point location of schools.
Community	Disadvantaged communities	Department of Water Resources	2015	By census place, tract, and block group where the annual median household income (MHI) that is less than 80 % of the Statewide annual MHI.
Transportation development	Current transportation infrastructure	Tiger and THP	2015	Primary Roads, Secondary Roads, Paved Roads, Unpaved dirt trails requiring 4WD, highway ramps Railroads.
Transportation development	Planned infrastructure	CalTrans, VTA, High Speed Rail Authority	2015 2009	152 expansion 101 expansion High speed rail alignment
Energy Development	Planned energy development	Ventyx	2015	Planned or proposed energy development.
Energy Infrastructure	Oil Wells	California Division of Oil, Gas and Geothermal Resources	2013	Existing oil and gas wells.
Agricultural Intensification	Rangeland to Ag current	Cameron <i>et al.</i> , TNC	2014	Change in FMMP rangeland from earliest FMMP to 2006-2008.
Agricultural Intensification	Projected rangeland conversion	USGS	2015	The top quintile for probability of rangeland conversion which was calculated based on the annual average transition probabilities summed across 5 scenarios.
Climate Change	Exposure Stress	Klausmeyer <i>et al.</i> TNC  CMIP5	2011	800m—combines an estimate of exposure from the projected regional climate changes and an estimate of the sensitivity of biodiversity in an area from a coping range derived from historical climate variability.
Conservation	Exiting protection/easements	CPAD, CCED, BPAD, San Benito Parks	2014 2013	Protected areas (fee) and easements.

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Influences	Type	Source	Date	Details
Conservation	Critical Habitat	USFWS	2014-2016	Designated areas containing features essential for the conservation of endangered species—provides protection from federal activities.
Conservation	HCP/NCCP	CDFW	2015	Provides for the regional protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity.
Conservation	Williamson Act Enrollment	California Department of Conservation Division of Land Resource Protection (DLRP)	2012	Voluntary, temporary restriction of lands enrolled to agricultural uses.
Biodiversity	Invasive Vegetation	CalFlora	2015	Cal-IPC listed plant species observations since 1980.
Biodiversity	Fish Passage Impediments	CalFish	2014	Inventory of known and potential barriers to anadromous fish in California from more than 200 data sources.

## Data References

Cadmus Group. 2013. California Integrated Assessment of Watershed Health. [https://www.epa.gov/sites/production/files/2015-11/documents/ca\\_hw\\_report\\_111213\\_0.pdf](https://www.epa.gov/sites/production/files/2015-11/documents/ca_hw_report_111213_0.pdf)

Cal-IPC and CalFlora. 2015. California Invasive Plant Inventory. Cal-IPC Publication 2006-02. California Invasive Plant Council. Berkeley, CA.

California Department of Conservation, California Farmland Mapping and Monitoring Program, 2012, 2014.

California Department of Conservation, Land Conservation Act, 2009-2012.

California Department of Fish and Game. California Interagency Wildlife Task Group. 2008. CWHR Version 8.2 personal computer program. Sacramento, CA.

California Department of Fish and Wildlife, California Natural Diversity Database, 2015.

California Department of Fish and Wildlife, Habitat Conservation Plans and Natural Community Conservation Plans, 2015.

California Department of Forestry and Fire Protection, CAL FIRE Fire and Resource Assessment Program (FRAP), and California Department of Fish and Wildlife, USDA Forest Service. FRAP Vegetation, 2015.

California Department of Forestry and Fire Protection, Timber Harvest Plan Roads, 2015.

California Department of Water Resources, Disadvantaged Communities, 2015.

California Division of Oil, Gas and Geothermal Resources, Oil Wells, 2013. <http://www.conservation.ca.gov/dog/maps/Pages/GISMapping2.aspx>.

California Natural Resources Agency, Wieslander Vegetation, 2009.

Cameron D. R., J. Marty, R. F. Holland. 2014. Whither the Rangeland?: Protection and Conversion in California's Rangeland Ecosystems. PLoS ONE 9(8): e103468. doi: 10.1371/journal.pone.0103468.

CyArk, Digitally Preserving: El Camino Real de California, Accessed 2016. <http://www.cyark.org/themes/el-camino-real>.

Federal Emergency Management Agency, Q3 Flood Zone GIS data, 1999.

Flint, L. E. and A. L. Flint. 2014. California Basin Characterization Model: A Dataset of Historical and Future Hydrologic Response to Climate Change, U. S. Geological Survey Data Release, doi:10.5066/F76T0JPB.

- Gonzalez P., J. J. Battles, B. M. Collins, T. Robards, and D. S. Saah. 2015. Aboveground live carbon stock changes of California wildland ecosystems, 2001-2010. *Forest Ecology and Management*, 348:68-77.
- Green Info Network, California Protected Areas Database, 2014. <http://www.calands.org/data>.
- Green Info Network, California Conservation Easement Database, 2014. <http://www.calands.org/cced>.
- Homer, C. G., J. A. Dewitz, L. Yang, S. Jin, P. Danielson, G. Xian, J. Coulston, N. D. Herold, J. D. Wickham, and K. Megown. 2015. Completion of the 2011 National Land Cover Database for the conterminous United States-Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, 81(5): 345-354. [http://www.asprs.org/a/publications/pers/2015journals/PERS\\_May\\_2015/HTML/index.html#345/z](http://www.asprs.org/a/publications/pers/2015journals/PERS_May_2015/HTML/index.html#345/z).
- Kelly, M., K. Ueda, and B. Allen-Diaz. 2008. Considerations for ecological reconstruction of historic vegetation: analysis of the spatial uncertainties in the California Vegetation Type Map dataset. *Plant Ecology*, 194: 37-49.
- Klausmeyer, K. R., M. R. Shaw, J. B. MacKenzie, and D. R. Cameron. 2011. Landscape-scale indicators of biodiversity's vulnerability to climate change. *Ecosphere* 2. doi: 10.1890/ES11-00044.1.
- Pacific States Marine Fisheries Commission, California Fish Passage Assessment Database, 2015. <http://www.calfish.org/ProgramsData/HabitatandBarriers/CaliforniaFishPassageAssessmentDatabase.aspx>.
- Penrod, K., P.E. Garding, C. Paulman, P. Beier, S. Weiss, N. Schaefer, R. Branciforte and K. Gaffney. Critical Linkages: Bay Area & Beyond. Produced by Science & Collaboration for Connected Wildlands, Fair Oaks, CA [www.scwildlands.org](http://www.scwildlands.org) in collaboration with the Bay Area Open Space Council's Conservation Lands Network [www.BayAreaLands.org](http://www.BayAreaLands.org).
- National Register of Historic Places, Santa Clara, San Benito, and Santa Cruz Counties. Accessed 2016.
- SFEI (San Francisco Estuary Institute). 2015. Santa Clara Valley Historical Ecology GIS Data version 2. Accessed 2015. <http://www.sfei.org/content/santa-clara-valley-historical-ecology-gis-data>.
- Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed 2016.
- Soil Survey Staff. Gridded Soil Survey Geographic (gSSURGO) Database for California. United States Department of Agriculture, Natural Resources Conservation Service. Available online at <https://gdg.sc.egov.usda.gov>. Accessed 2016.
- Soil Survey Staff. National Value Added Look Up (VALU) Table Database for the Gridded Soil Survey Geographic (gSSURGO) Database for the United States of America and the Territories, Commonwealths, and Island Nations served by the USDA-NRCS. United States Department of Agriculture, Natural Resources Conservation Service. Available online at <https://gdg.sc.egov.usda.gov>. Accessed 2016.
- State Water Resources Control Board, Hydrogeologically Vulnerable Areas, 2000. [http://www.waterboards.ca.gov/gama/docs/hva\\_map\\_table.pdf](http://www.waterboards.ca.gov/gama/docs/hva_map_table.pdf).
- TNC (The Nature Conservancy), California Freshwater Assessment, 2014.
- TNC (The Nature Conservancy), Habitat Suitability Weighted Richness, 2015.
- Thorne, J., J. Bjorkman, and N. Roth. 2012. Urban Growth in California: Projecting Growth in California (2000-2050) Under Six Alternative Policy Scenarios and Assessing Impacts to Future Dispersal Corridors, Fire Threats and Climate-Sensitive Agriculture. California Energy Commission. Publication number: CEC-500-2012-009.
- U. S. Census Bureau, TIGER (Topologically Integrated Geographic Encoding and Referencing), roads GIS data, 2010.
- U. S. Census Bureau, Census Data, 2010.
- U. S. Fish and Wildlife Service. 2011. National Wetlands Inventory. U. S. Department of the Interior, Fish and Wildlife Service, Washington, D. C. <http://www.fws.gov/wetlands/>.
- U. S. Fish and Wildlife Service, Endangered Species Program, ECOS Joint Development Team, FWS Critical Habitat for Threatened and Endangered Species Dataset, 2016.
- U. S. Geological Survey, National Hydrography Dataset. Accessed 2016.
- University of California, Division of Agriculture and Natural Resources, California Agricultural Tourism Directory, 2016.
- Ventyx Inc. EV Energy Map, 2016.
- Wilson, T. S., B. M. Sleeter, D. R. Cameron. 2016. Future land-use related water demand in California. *Environmental Research Letters*. doi:10.1088/1748-9326/11/5/054018.