

ACE DATASET FACT SHEET

Aquatic Significant Habitats



DS2756

- DS2758 - Riparian by Watershed
- DS2759 - Significant Anadromous Fish Habitat
- DS2761 - Vernal Pools by Watershed
- DS2762 - Lakes by Watershed
- DS2763 - Ponds by Watershed
- DS2764 - Freshwater Wetlands Habitat by Watershed
- DS2765 - Meadows and Emergent Wetlands by Watershed
- DS2766 - Saline Wetlands by Watershed
- DS2767 - Seeps and Springs by Watershed

UPDATED 2/21/2018

INTENT AND PURPOSE

The **Significant Aquatic Habitats** dataset is one of the components of the California Department of Fish and Wildlife's (CDFW) Areas of Conservation Emphasis (ACE) suite of aquatic conservation information. The Significant Aquatic Habitats dataset provides a variety of information on aquatic habitats to help determine the likelihood of the presence of habitat or vegetation that are the focus of state, national, or locally legislated conservation laws, as well as significant habitat areas essential to the survival of specific species of conservation concern. Aquatic habitat data are synthesized from information on vegetation and land cover, and species-specific habitat information. The number of significant habitats in a watershed is summarized in the **Significant Aquatic Habitat Summary**, and a reference to the original vegetation, landcover, or other datasets that map the significant habitat elements is provided for each watershed.



Areas of Conservation Emphasis

The Aquatic Significant Habitats data set is expected to be used along with other ACE datasets to provide a robust assessment of the presence and relative importance of elements important for biodiversity conservation.

BACKGROUND INFORMATION

The separate Aquatic Significant Habitat datasets were a new addition to ACE in 2017. The previous version of ACE (ACE-II) combined aquatic habitat information in the terrestrial hexagons.

Further work developing the ACE Aquatic data will continue in 2018 (ACE 3, phase 2). This includes further compiling datasets for inclusion in existing significant habitats categories, further developing summary statistics and mapping approaches to best meet user needs, and compiling and adding focal-species significant habitat information.

DATA SOURCES AND MODELS USED

The ACE Aquatic Significant Habitats dataset provides a variety of information on aquatic habitats synthesized from vegetation and land cover maps, as well as from focal species distribution maps.

Source Data

Significant Anadromous Fish Habitat [ds2759]

Significant Anadromous Fish Habitat is based on Federal Critical Habitat for anadromous fish species, which migrate between inland rivers and the ocean during their life cycle. The dataset identifies areas critical for the survival and reproduction of anadromous fish, which also correspond with areas of year-round water likely to be important to other aquatic species. The dataset includes a reference field giving the species name and BIOS dataset number(s) of the critical habitat maps intersecting with each watershed.

Riparian by Watershed [ds2758]

Riparian includes vegetation types encompassed by the general CWHR habitat types Valley Foothill Riparian, Montane Riparian, Desert Riparian, Palm Oasis, and Aspen. This riparian data set is derived from the fine scale NVC/SCV VegCAMP vegetation maps, National Wetlands Inventory riparian mapping for California (<https://www.fws.gov/wetlands/Data/Mapper.html>), fveg best available data (FVEG15_1, CalFire-FRAP 2015), and several BIOS datasets that contain information on CDFW riparian habitat survey and monitoring data. The dataset includes a reference field giving the BIOS dataset number(s) of the original vegetation or landcover dataset(s) that map riparian vegetation types in each watershed.

Lakes by Watershed [ds2762]



Lakes by watershed is based on the CDFW California Lakes layer (BIOS Hydrography Reference layer), which is considered the best-available lakes dataset for California. Currently the dataset shows presence or absence of lakes by watershed.

Freshwater Wetlands by Watershed [ds2764]

The freshwater wetlands dataset is a compilation of meadows and freshwater emergent wetlands, ponds, seeps and springs, and vernal pools. Where possible, mapped wetlands were separated into those four categories of freshwater wetland. However, there is some overlap between categories because not all source datasets group their wetland types into these four categories. For example, vernal pools, seeps, and springs may sometimes be mapped as emergent wetlands; springs may sometimes be mapped as ponds or meadows. Freshwater wetlands data were derived from a variety of sources including fine scale NVC/SCV VegCAMP vegetation maps (<https://www.wildlife.ca.gov/Data/VegCAMP/Reports-and-Maps>), National Wetlands Inventory mapping (USFWS 2017; <https://www.fws.gov/wetlands/Data/Mapper.html>), fveg15_1 (CalFire 2015), as well as additional BIOS datasets specifically mapping vernal pools, meadows, seeps and springs.

The dataset includes a reference field giving the BIOS dataset number(s) of the original vegetation or landcover dataset(s) that map freshwater wetland types in each watershed. Users should refer to the source datasets for a full description of map classes and associated wetland definitions.

- Meadows and Emergent Wetlands by Watershed – ds2765
This includes freshwater emergent vegetation types mapped in 1) fine scale NVC/SCV VegCAMP vegetation maps; 2) Fveg15_1 (FEW); and, 3) NWI. In addition it includes mapped Sierra Nevada mountain meadows compiled by UC Davis (Fryjoff-Hung & Viers, 2012; <https://meadows.ucdavis.edu/>).
- Ponds by Watershed – ds2763
This includes ponds mapped by NWI, excluding man-made or anthropogenically-modified ponds.
- Seeps and Springs by Watershed – ds2767
This includes rare seep and spring natural communities mapped by CNDDDB, desert springs mapped in support of the Desert Renewable Energy Conservation Plan [ds820], and the Mojave Desert Spring Survey (Zdon 2016).
- Vernal Pools by Watershed – ds2761
This includes vegetation polygons mapped as vernal pool grassland in NVC/SCV VegCAMP vegetation maps; vernal pools and vernal pool fairy shrimp occurrences mapped by CNDDDB (when not more specifically mapped by another data source); vernal pool mapping projects of San Diego [ds188], the South Coast Ranges [ds948], Modoc National Forest [ds949], and the Great



Valley [ds1070]; and vernal pools mapped in the California Aquatic Resource Inventory (CARI; SFEI 2017)

Saline Wetlands by Watershed [ds2766]

Saline wetlands includes areas mapped as estuarine emergent wetlands by NWI, or vegetation types that crosswalk to CWHR type "Saline Emergent Wetlands"(SEW) in NVC/SCV VegCAMP vegetation maps.

Data Processing Steps and Ranking Criteria

The ACE Significant Habitat ranks were developed to provide a broad overview of important habitat areas across the state.

To enable standardized evaluation of habitat with other ACE datasets, all data compiled in this module are presented in presence/absence in watersheds. Significant habitat ranks are based on the number of significant habitat categories present within the watershed. Significant habitat areas were not ranked by size or importance, because current resolution and quality of vegetation and landcover maps does not support analysis at this level on a statewide basis. Further work to refine ranking criteria will continue during ACE 3, Phase 2 in 2018.

List of data sources

California Aquatic Resource Inventory (CARI; SFEI 2017)
Vegetation - Anza-Borrego Desert State Park [ds165] (Keeler-Wolf et al. 1998)
Vegetation - Point Reyes [ds169] (Schirokauer et al. 2003)
Vegetation - San Felipe Valley [ds172]
Vernal Pool Amphibians, Shrimp, Plants - San Diego [ds188] (Greer et al. 2002)
Vegetation - Napa County and Blue Ridge Berryessa [ds201] (Thorne et al. 2004)
Vegetation - Pine Creek, WA and Fitzhugh Creek, WA [ds484] (Hickson et al. 2008)
Vegetation - Lassen Foothills [ds564]
Vegetation - Northern Sierra Nevada Foothills [ds566] (Menke et al. 2011)
Vegetation - Gabilan Ranch, 2006 [ds614] (AIS 2006)
Vegetation - San Benito River, 2007 [ds616] (AIS 2007)
Vegetation - McKenzie Preserve [ds703]
Vegetation - Oak Grove, San Diego County, 2011 [ds712] (Boul et al. 2011)
Vegetation - Garcia River, Mendocino County, 2005 [ds722] (AIS & Carah 2007)
Vegetation - Joshua Tree National Park, 2012 [ds730]
Vegetation - Mojave Desert for DRECP - Final [ds735] (Menke et al. 2013)
Vegetation - Canada de San Vicente - San Diego County [ds770] (VegCAMP 2013)
Unique and Important Vegetation Observations for the DRECP, 2013 [ds820]
Vegetation - Liberty Island, 2012 [ds821] (Hickson & Keeler-Wolf 2007)



Vegetation - Santa Monica Mountains NRA [ds935] (Hickson & Keeler-Wolf 2007)

Vegetation - Palos Verdes NCCP Preserve [ds939] (Verdone & Evens 2010)

Vegetation - Pinnacles National Monument [ds947] (Kittel et al. 2009)

Vernal Pools, South Coast Ranges [ds948]

Vernal Pool Complexes, Modoc National Forest [ds949]

Vegetation - Marin County Open Space District [ds957] (AIS & Kennedy 2008)

Vegetation - John Muir National Historic Site [ds958] (O'Neil & Egan 2004)

Vegetation - Lower Santa Clara River [ds983]

Vegetation - Sequoia and Kings Canyon National Parks Vegetation Mapping Project [ds984]

Vegetation - Fish Slough [ds985] (VegCAMP 2014)

Vegetation - Whiskeytown National Recreation Area Vegetation Mapping Project [ds986] (Stuart et al. 2003)

Vegetation - Marin Municipal Water District (MMWD) [ds996] (Evens & Kentner 2006)

Vegetation - Mid Peninsula Open Space [ds997]

Vegetation Map - Johnson Valley - CDFW [ds1019] (Keeler-Wolf 2014)

Vegetation - Suisun Marsh - 2012 [ds1029]

Vegetation - Western Madera County [ds1057]

Vernal Pool Distribution - California's Great Valley - 2012 [ds1070] (Witham et al. 2014)

Vegetation - Carrizo Plain National Monument, Ecological Reserve and Adjacent Elk Range [ds1094] (Buisson et al. 2010)

Vegetation - Western Riverside County Update - 2012 [ds1196] (AIS 2015)

Vegetation (fveg) - CALFIRE FRAP [ds1327] (CALFIRE 2015)

Vegetation - Proposed Tehachapi Pass High Speed Rail Corridor [ds1328] (VegCAMP 2015)

Vegetation - Orange County - 2012 [ds1336] (Buck-Diaz & Evens 2015)

Vegetation - Cow Creek - 2013 [ds1345] (Merrill 2015)

Vegetation - Mill Creek - 2013 [ds1346] (Merrill 2015)

Vegetation - Point Mugu [ds1500] (HDR 2013)

National Wetlands Inventory - California - USFWS [ds2630] (USFWS 2017)

Vegetation - Great Valley Ecoregion [ds2632] (VegCAMP 2013)

Mountain Meadows - Sierra Nevada - UC Davis [ds2671] (Fryjoff-Hung & Viers 2012)

Vegetation - Suisun Marsh - 2015 [ds2676] (i.e., Suisun_2015)

Vegetation - Sonoma County [ds2691] (i.e., Sonoma) (Klein et al. 2015)

HOW TO USE THE DATA LAYER

The ACE Significant Habitats dataset provides a single snapshot of significant habitat information across the state. The scoring indicates how many significant habitats are mapped within a watershed, and the data attributes point users to the original source datasets that have mapped significant habitats within the watershed.

Common uses of the dataset include:



1. Select a watershed and view the attribute table to determine whether there is a mapped significant habitat within the watershed, and what type(s) of significant habitats have been mapped in the area. The BIOS dataset number of any dataset with significant habitat in the watershed is given in the ACE attribute table. The user can then use that information to overlay the BIOS source dataset to see exactly where the significant habitats are mapped.
2. Select a watershed to view its overall significant habitat rank (1-5) and the significant habitats that comprise that rank, and how it compares with neighboring or other watersheds.

Field Definitions

Using the *Identify Features* or *Select* tool in the ACE viewer, users can obtain a table of information (i.e., attribute table) for a watershed or area of interest. The ACE viewer allows the user to print the table or save it as a spreadsheet (.csv) file. The definitions below describe the attribute table fields for this dataset.

Field	Definition
Number of Significant Aquatic Habitats	Sum of AnadHabCount, Riparian, Lakes, FreshWetld, and AltrdWetld.
Significant Aquatic Habitat Weight	Statewide normalized sum of aquatic significant habitats in the HUC 12 watershed.
Riparian	Presence or absence of vegetation types that crosswalk to CWHR types "Desert Riparian"(DRI), "Montane Riparian" (MRI), "Valley Foothill Riparian"(VRI), "Palm Oasis"(POS) and "Aspen" (ASP) that overlap each HUC 12 watershed. Indicated as "Y" if present and "N" if absent.
Anadromous Habitat	Count of the number of anadromous species with USFWS critical habitat overlapping the HUC 12 watershed.
Lakes	Presence or absence of lakes in the HUC 12 watershed. Indicated as "Y" if present and "N" if absent.
Freshwater Wetlands	Freshwater wetlands. Count of Freshwater Wetland types (Meadows and Emergent Wetlands, Ponds, Seeps and Springs, Vernal Pools) in the hexagon.
Meadow and Emergent Wetlands	Presence or absence of mountain meadows and freshwater emergent wetlands mapped by the National Wetlands Inventory (NWI) and vegetation types that crosswalk to CWHR types "Freshwater Emergent Wetland"(FEW) and "Wet Meadow"(WTM) that overlap each HUC12 watershed. Indicated as "Y" if present and "N" if absent.
Ponds	Presence or absence of natural ponds as mapped by NWI that overlap each HUC12 watershed. Stockponds or other artificially flooded ponds are included under altered wetlands. Indicated as "Y" if present and "N" if absent.
Seeps and Springs	Presence or absence of areas mapped as seeps or springs that overlap each HUC 12 watershed. Indicated as "Y" if present and "N" if absent.



Field	Definition
Vernal Pools	Presence or absence of areas mapped as vernal pools that overlap each HUC 12 watershed. Indicated as “Y” if present and “N” if absent.
Saline Wetlands	Presence or absence of areas mapped as estuarine emergent wetlands by NWI, or vegetation types that crosswalk to CWHR type “Saline Emergent Wetlands”(SEW). Indicated as “Y” if present and “N” if absent.
Significant Aquatic Habitat Rank	Ranks of 1-5 assigned to the statewide normalized aquatic significant habitat values, with all zero values removed and remaining values broken into 5 quantiles, each containing the same number of HUC 12 watersheds.

DATA PRECISION AND LIMITATIONS

ACE provides data to help guide and inform conservation priorities in California. All ACE data layers are limited by the accuracy, scale, extent of coverage, and completeness of the input data at the time they were run. We highly recommend reviewing available metadata and ACE Factsheets prior to interpreting these data. The ACE maps do not replace the need for site-specific evaluation of biological resources and should not be used for regulatory purposes.

The ACE habitat data was selected to represent a useful array of different habitat features that reflect state and local mandates currently used to support landscape conservation in California. For example, riparian is addressed through Sect 1600 and Sect 404 permitting; and wetlands of different types are addressed through other federal and state legislation (e.g., Clean Water Act, State Groundwater Management Act). Wetlands and riparian are also used by CDFW’s Wildlife Conservation Board as key criteria for conservation planning.

The most important considerations used for inclusion beyond those mentioned, are that:

1. The data can be compiled to provide uniform statewide coverage (e.g., no major information gaps in the state). However, note that the age, accuracy, and precision of the best-available vegetation data does vary across the state.
2. Each dataset supplies useful information for specific purposes and does not conceptually overlap another. For example, wetlands data have, to the extent possible, been broken down into non-overlapping components (see list above). However, as described above, there is some overlap between freshwater wetlands categories.

Two levels of precision should be considered when using the ACE data. The first is the level of spatial resolution imparted by watersheds. All ACE data, no matter the precision and accuracy of its source, is applied at the watershed resolution. At this time all of the habitat information presented in this Aquatic Habitat module is coded as either “present” (indicated by a 1) or “absent” (indicated by a “0”). This



allows for a simple synthetic scoring which totals up the number of different entities present in a particular watershed.

The second is the source information's original precision and accuracy. In the case of habitat data, this relates to the source mapping. Vegetation data that feeds the information on wetlands, riparian, and rare natural communities from relatively precise VegCAMP data is mapped at the vegetation alliance level and usually has a minimum map unit size of between 1 and 2 acres. The National Wetland Inventory also has a similar fine spatial scale (down to ¼ acre) that generally depicts individual isolated wetlands at a minimal scale of 1:24,000.

Fveg15_1 is based on VegCAMP information where it exists, but it is currently available for about half the state (original data source and year for each pixel is available in the fveg15_1 attribute table). The remainder of the state is mapped in fveg using less precise and accurate data. Most of these data are based on US Forest Service mapping methods, which use LandSat 30 m pixel imagery to form polygons mapped to the CalVeg classification system. Vegetation including wetlands or riparian habitat tend to occur as small and/or narrow strips that cannot often be depicted using 30 m pixel-based imagery. The CalVeg classification system also tends to emphasize marketable timber and other woody vegetation and tends to generalize categories of wetlands, riparian, and other non-economically important vegetation, thus obviating its use to detect some rare natural communities.

The development team for ACE have already made certain decisions that relate to scale-dependent issues. For example, wetland and riparian data was primarily sourced from datasets other than CalVeg or other 30 m pixel data.

Users should be aware of the limitations of the source data based on its thematic and spatial resolution.

DATA ACCESS

All datasets are available for viewing and download in BIOS.

For assistance with interpretation of vegetation data, contact [VegCAMP](#).

For assistance with interpretation of ACE datasets contact [Melanie Gogol-Prokurat](#).

ACKNOWLEDGEMENTS

ACE₃ Aquatic Subteam: Karen Miner, Janet Brewster, Kristina White, Melanie Gogol-Prokurat, Peter Ode, Josh Grover, Kevin Shaffer, Jonathon Nelson, Krissy Atkinson, Jeff Weaver, Roger Bloom, Hilde Spautz, Sandra Hill, Peter Perrine, Steve Goldman

ACE-II Sensitive Habitats model development: ACE-II technical team, 2009. Melanie Gogol-Prokurat, Monica Parisi, Adrienne Truex, Eric Haney, Dan Applebee.

GIS Scripting: Ryan Hill and Sandra Hill



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For additional information and a full list of ACE 3 Factsheets, see the [ACE₃ Technical Report](#). Areas of Conservation Emphasis, CA Dept of Fish and Wildlife, www.wildlife.ca.gov/Data/Analysis/Ace

